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September 12, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE EXPANDED ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: ADM Tihonet Mixed Use Development
PROJECT MUNICIPALITY	: Carver, Plymouth and Wareham
PROJECT WATERSHED	: Buzzards Bay
EEA NUMBER	: 13940A
PROJECT PROPONENT	: ADM Development Services LLC
DATE NOTICED IN MONITOR	: July 23, 2008

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62I) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of an Environmental Impact Report (EIR). In a separate Draft Record of Decision, I propose granting a Phase One Waiver to allow a portion of the project (Phase A) to proceed to state permitting prior to completion of the EIR for the entire project. The DROD will be noticed in the September 24, 2008 issue of the *Environmental Monitor* for a 14-day public comment period. Within seven days of the close of comments, I shall reconsider, modify, or confirm the waiver in a Final Record of Decision.

The proposed project consists of development of a 6,074-acre site in the towns of Wareham, Carver and Plymouth. The project is proposed as a phased development over the next 25 years or more. The site currently contains the corporate headquarters of the A.D. Makepeace (ADM) Company, and includes cranberry bogs as well as undeveloped lands considered ecologically significant due to the presence of BioMap Core Habitat, Priority Habitat for rare and endangered species, and the underlying sole source aquifer.

A Special Review Procedure (SRP) was issued for the project in a Certificate dated January 29, 2007. In accordance with the SRP, the proponent has filed an Expanded

Environmental Notification Form (EENF) that includes baseline environmental resource assessment and infrastructure assessment for the entire project site, and information and analysis pertaining to the proposed Phase A and Phase B developments. Pursuant to the SRP, I am issuing a Scope for the EIR for Phase B (the Business Development Overlay and General Commercial District) and a Draft Record of Decision (DROD) for Phase A. The SRP allows for subsequent phases of the project to file a new ENF and includes requirements for cumulative impact assessment, public outreach, and extended public comment periods.

Phase One Waiver

The proponent has requested that Phase A of the project be allowed to proceed to state permitting prior to completion of an EIR for the entire project. Phase A (which includes A1 and A2) and Phase B are located within the Town of Wareham. Phase A1 consists of construction of 115,200 square feet (sf) of office, laboratory and office space on the southeastern quadrant (approximately 18.4 acres) of the 60-acre Tihonet Technology Park. Phase A2 consists of construction of a 40,000 sf medical office facility, on a six-acre parcel located at Lou Avenue off Route 28.

The proposed Phase A involves alteration of approximately 20 acres of land and creation of 11 acres of new impervious area. Phase A is expected to generate approximately 2,250 vehicle trips on an average weekday and includes 577 parking spaces. Water use and wastewater generation is estimated in the EENF at approximately 8,000 gallons per day. The Phase A1 project site includes priority habitat for state-listed species and Phase A will most likely result in a "take". The EENF proposes an on-site Title V septic system for Phase A1 with enhanced nitrogen removal. The preferred alternative for Phase A2 is a municipal sewer tie-in. However, if this is not feasible, a Title V system with enhanced nitrogen removal is proposed. Potable water supply for Phase A will be provided by the Wareham Fire District.

Project Description

The phased development as proposed in the EENF consists of a mixed-use village community that will incorporate principles of smart growth, open space preservation, low impact development, traditional village design, and pedestrian orientation. The EENF proposes the use of Transfer of Development Rights (TDR) to concentrate development in certain areas and ensure conservation of ecologically significant lands. As further detailed above, Phase A includes 155,200 sf of commercial development. Phase B consists of development of a 1,140-acre portion of the site. The conceptual plan for Phase B entails construction of approximately 1.7 millions sf of development to include retail, manufacturing, warehouse, light industry, office, medical office, research and development uses, and a hotel.

The EENF includes a conceptual plan for Phase C, which includes the remaining portions of the project site (approximately 4,910 acres) in the towns of Carver, Plymouth and Wareham. The conceptual plan is based on current zoning that would allow development of 1,366 single-family homes, 380 condominiums, and 110 apartments. As discussed in the EENF, the proponent is working with the surrounding communities to implement TDR and other innovative zoning

tools. The Phase C development plan will likely include agricultural, mixed-use residential, village-scale retail, with the remainder to be held as conservation land.

Phase B will result in alteration of approximately 130 acres of land, including 80 acres of new impervious area. Wetlands impacts include 3,000 square feet of Bordering Vegetated Wetlands (BVW) alteration on-site and an additional 0.3 - 1 acre of alteration associated with off-site roadway improvements. Phase B will also impact 5,800 sf of other wetlands including Bordering Land Subject to Flooding (BLSF) on-site and 1-2 acres of BLSF off-site as a result on proposed roadway improvements. Phase B may also impact Riverfront Area. Phase B is expected to generate 17,854 trips on an average weekday and includes 4,000 parking spaces. The EENF proposes that a portion of the Phase B wastewater (32,000 gallons per day (gpd)) be discharged to the municipal sewer system and the remainder (89,000 gpd) be collected, treated and disposed on-site through one or more wastewater treatment facilites. The average water demand for Phase B is estimated in the EENF at 66,000 gpd and will be provided by the Wareham Fire District.

Permits and Jurisdiction

Permits required for Phase A include a Vehicular Access Permit from the Massachusetts Highway Department (MassHighway) for access onto Route 28 and a Conservation and Management Permit from the Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program (NHESP). Phase A also requires an Order of Conditions from the Wareham Conservation Commission (and, on appeal only, a Superseding Order from the Massachusetts Department of Environmental Protection (MassDEP)).

Phase B requires a MassHighway Vehicular Access Permit, a Conservation and Management Permit from NHESP, and an Order of Conditions from the Wareham Conservation Commission (and, on appeal only, a Superseding Order from MassDEP). Phase B also requires a Groundwater Discharge Permit, 401 Water Quality Certification, Water Supply System Distribution Modification, and a Sewer Extension/Connection Permit from MassDEP. Phases A and B may be subject to federal consistency review by the Massachusetts Office of Coastal Zone Management (CZM). The project is subject to review by the Massachusetts Historical Commission (MHC). The project is also subject to the Executive Office of Energy and Environmental Affairs (EEA)/MEPA Greenhouse Gas Emissions Policy and Protocol. Phase C will require additional permits including a Groundwater Discharge Permit and New Source Approval from MassDEP and a Conservation and Management Permit from NHESP.

The project is undergoing environmental review and subject to the requirements for an EIR because it requires state agency permits and exceeds MEPA review thresholds, including several thresholds for a mandatory EIR. The project is undergoing review pursuant to: Section 11.03(1)(a)(1) and (2) because it will involve alteration of 50 or more acres of land and creation of 10 or more acres of new impervious area; Section 11.03(2)(b)(2) because it will likely result in a taking of a state-listed species; Section 11.03 (3)(b)(d) and (f) because it involves alteration of 5,000 or more sf of BVW and alteration of one-half or more acres of other wetlands; Section 11.03(4)(b)(3) because it involves construction of one or more new water mains five or more miles in length; Section 11.03(5)(b)(3)(c) because it will result in construction of five or more miles of new sewer main; and Section 11.03(6)(a)(6) and (7) because it will result in generation

of 3,000 or more new vehicle trips and 1,000 or more new parking spaces. Phase B may also exceed the mandatory EIR threshold at 11.03(1)(1)(a) for alteration of one or more acres of BVW. Phase C may exceed other MEPA review thresholds.

The EENF indicates that the proponent may apply for financial assistance from the Commonwealth, including grants from the Massachusetts Technology Collaborative and the Massachusetts Opportunity Relocation and Expansion (MORE) Program. If the project involves financial assistance from the Commonwealth, MEPA jurisdiction will be broad and extend to all aspects of the project likely to cause damage to the environment as defined in the MEPA regulations. In the absence of financial assistance, MEPA jurisdiction would extend to aspects of the project within the subject matter of required state permits that are likely to cause damage to the environment as defined in the MEPA regulations. In this case, MEPA jurisdiction would extend to water supply, wastewater, wetlands, water quality, rare species, historical and archaeological resources, transportation, land and stormwater.

Expanded Environmental Notification Form (EENF) Review

The EENF presents a baseline environmental resource assessment as required by the SRP that includes a description of wetlands and water resources, rare species and wildlife habitat, land uses, historical and archaeological resources. The EENF includes maps, aerial photographs and other figures to supplement the baseline assessment. The EENF also provides information on existing water supply, wastewater, utility, and transportation infrastructure.

The EENF provides information on existing and proposed conditions for Phase A, and includes a Greenhouse Gas (GHG) Emissions analysis and traffic study for Phase A. The proposed development program for Phase A has changed since the Certificate on the SRP was issued. Phase A1 has been reduced from 150,000 sf to 115,000 sf and its location has changed to the southeast quadrant of the Tihonet Technology Park. In addition, a 40,000 sf medical office building is proposed as Phase A2 on another parcel located on Lou Avenue off Route 28. The proponent has committed to implement Low Impact Development (LID) measures for Phase A.

The EENF indicates that no wetlands alteration will occur as part of Phase A1 and that it uses a disturbed portion of the site. The EENF concludes that a "take" of state-listed species is unlikely. However, NHESP disagrees with this conclusion. The proponent is in consultation with NHESP and will be filing an application for a Conservation and Management Permit. The alternatives analysis indicates that development of Phase A1 in other quadrants may impact riverfront area and result in more land alteration compared with the preferred alternative. The proponent has requested flexibility as part to develop Phase A1 on another quadrant of the 60-acre site. I note that the Draft Record of Decision (DROD) on the Phase One Waiver requires the submission of a Notice of Project Change if the proponent chooses to develop Phase A1 on another part of the site.

Based on the EENF, Phase A1, with mitigation, will result in emissions of 3,123 to 3,233 tons of Carbon dioxide (CO_2) per year from building-related and transportation sources. The proposed mitigation measures are expected to result in a five percent to eight percent reduction in CO_2 emissions. Phase A2, with mitigation, will result in 4,173 to 4,363 tons of CO_2 per year. The proposed mitigation measures are expected to reduce emissions by 8 percent to 12 percent.

The proponent has committed to a range of mitigation measures including high-efficiency heating, ventilation and air conditioning (HVAC) systems, super insulation, and third party building commissioning to ensure energy performance. Transportation measures include roadway improvements and bicycle facilities. Building-related emission reduction measures contribute to a greater part of the overall reductions expected compared to transportation measures. The EENF indicates a 52 percent reduction in CO_2 emissions for Phase 2 building-related emissions and a 17 percent reduction for Phase A1 based on the mitigation proposed. During EENF review, the proponent made clear commitments in a letter dated September 9, 2008, to implement all of the mitigation measures identified in the EENF as part of Phase A1 and Phase A2, with the exception of grey water re-use. The proponent will consider the re-use of grey water for future project phases.

The EENF evaluated traffic impacts of Phase A on nearby transportation infrastructure and the impacts of projects currently proposed or underway within the study area. As noted in the EOT comment letter, improvements proposed for the Wareham Crossing project (EEA# 13274) are expected to provide sufficient capacity to accommodate the impacts of Phase A. The proponent has also proposed additional mitigation measures along the Route 28 corridor that include traffic signal optimization, minor geometric improvements, pavement markings and sign upgrades at the Route 28/Lou Avenue intersection, and a monitoring program at the Route 28/Tihonet Road intersection to determine whether a signal is warranted. The proponent is committed to install the signal if warranted. The proponent has also committed to Transportation Demand Measures (TDM) for Phase A. The proponent should provide EOT with a letter of commitment to implement the mitigation measures proposed.

As described in the EENF, Phase B includes the Business Development Overlay District (BDOD) located north of Route 25 and an additional 300-acre General Commercial District located south of Route 25. Phase B encompasses 1,140 acres in total. In addition to the retail, manufacturing and other uses proposed, Phase B will include a continuation of existing agricultural activities. The EENF includes a conceptual plan for development consisting of 24 lots (1.7 million sf of development) and information on potential impacts including land and wetlands alteration, water demand and wastewater generation, rare species, traffic and historical and archaeological resources. The EENF described existing and proposed conditions and includes a traffic impact study. The EENF notes that Phase B could accommodate several million sf of development compared to the 1.7 million sf proposed as a "moderate build". However, the EENF does not include a detailed alternatives analysis, which should be provided in the DEIR as detailed in the Scope below.

The traffic study in the EENF provides an evaluation of cumulative traffic impacts of Phase A and Phase B on nearby transportation infrastructure and includes a comprehensive package of mitigation measures. In its comment letter, EOT generally concurs that the proposed mitigation measures will mitigate the impacts of the project as proposed. However, the DEIR should include additional information and analysis as further detailed in the Scope below and in EOT's comment letter.

The EENF included a conceptual plan for Phase C based on current zoning for residential uses, and considered impacts associated with residential development as part of the

transportation study. The proponent is working with the Towns of Carver, Plymouth and Wareham regarding use of Transfer of Development Rights (TDR) and other innovative zoning tools that would allow a mix of development for Phase C and protect large areas of contiguous habitat. Phase C may also include an expansion of existing agricultural activities. The proponent is considering certification under the Leadership in Energy and Environmental Design (LEED) for Neighborhood Development for Phase C, and investigating renewable energy options for the project. The proponent has committed to a smart-growth, low-impact village-scale design for Phase C. The EENF proposes development of on-site water supply wells and wastewater treatment and disposal facilities to support Phase C. As noted in the EENF and in comment letters received, portions of Phase C are a significant distance from existing water supply, wastewater, and transportation infrastructure. The proponent should coordinate closely with state and regional planning agencies and other stakeholders in developing the Master Plan for the project, and solutions to infrastructure needs that are consistent with the smart growth and low impact design goals of the project.

SCOPE

General

The proponent should prepare a Draft EIR (DEIR) in accordance with the general guidance for outline and content found in Section 11.07 of the MEPA regulations as modified by this Scope. Although this DEIR Scope is for the proposed Phase B, it also requires that certain aspects and impacts of Phase C be addressed in order to avoid segmentation (pursuant to Section 11.03(2)(c)), evaluate cumulative impacts, and ensure that implementation of Phase B will not preclude options to avoid, minimize, or mitigate environmental impacts associated with future phases.

The DEIR should include an analysis of the cumulative impacts of Phase A and Phase B. The DEIR should discuss the consistency of the proposed Phase B with the conceptual Master Plan presented in the EENF. The DEIR should include a revised and updated Master Plan for the entire project site, including Phase C. I expect that the Master Plan will identify specific locations and development boundaries of the Phase C components and include more detail on the types of uses proposed, areas designated for conservation, and infrastructure plans. The DEIR should evaluate cumulative impacts of greenhouse gas (GHG) emissions and nitrogen loading for all phases of the project (A, B, and C) as further detailed in the Air Quality and Wastewater sections below. The DEIR should include information and analysis to demonstrate that implementation of the proposed Phase B will not preclude options to avoid, minimize or mitigate environmental impacts associated with future project phases.

The DEIR should evaluate trade-offs inherent in the evaluation of impacts to land, such as the potential for increased nitrogen loading in some areas that may result from the transfer of development rights from cranberry bogs (where classified as open space) to other areas, as discussed in the comment letter from the Town of Wareham.

The DEIR should include a copy of this Certificate, the Certificate establishing a Special Review Procedure, and any Record of Decision or other Certificates issued for the project. The DEIR should include a copy of each comment letter received and responses to comments. The DEIR should include a description of all aspects of the project and a schedule for construction and other development activities. The DEIR should include maps and plans at a reasonable scale, a project summary, a list of permits required and a description of any changes since the filing of the EENF. The DEIR should include an overlay of the proposed project in the context of sensitive resources on, and in the vicinity of, the project site to facilitate review and assessment of potential impacts.

I expect that the proponent will consult with the Towns of Wareham, Carver and Plymouth, and with state and regional planning agencies, during preparation of the DEIR and refinement of the preferred alternative and mitigation plans.

Open Space and Conservation

The DEIR should clarify, for the entire project, the amount and type of open space and describe proposed mechanisms for permanent protection of wildlife habitat and other open space areas. The proponent should consider using the definitions and categories of open space proposed by the Southeastern Regional Planning and Economic Development District (SRPEDD) and the Plymouth/Carver Aquifer Advisory Committee in their comment letters. This may help to clarify the proponents open space plans and to identify, on site plans, where the proposed contiguous areas of open space and wildlife corridors will be located.

The DEIR should include an update on any zoning changes relevant to the project and discuss plans to use Transfer of Development Rights (TDR) bylaws to concentrate development impacts while protecting open space resources. The DEIR should identify proposed sending and receiving areas. I encourage the proponent to continue working with the towns, state agencies and other organizations to ensure that areas of significant ecological value, such as the Frogfoot area in the Plymouth portion of the project site, are permanently protected.

Alternatives

The DEIR should include an evaluation of all feasible alternatives and describe how the preferred alternative will avoid, minimize and mitigate environmental impacts to the maximum extent feasible. The alternatives analysis should include a clear comparison (quantified to the extent feasible) of the impacts of each alternative and its project components (including but not limited to acres of land alteration, impervious area, wetlands, habitat impacts, water use and wastewater generation, traffic and parking, open space and conservation). The DEIR should provide a rationale to explain why certain alternatives were selected and others ruled out for further consideration.

The EENF included a conceptual plan for Phase B identifying 24 development lots. The DEIR should include site plans for the proposed project layout and alternative configurations indicating the locations and footprints of proposed buildings and other project elements. The DEIR should present overlays of alternative project configurations in the context of sensitive

resources to facilitate an assessment and comparison of impacts. The "moderate build" alternative proposed in the EENF would result in development on portions of each of the 24 lots. The DEIR should compare this with an alternative layout that concentrates development on a smaller number of lots to further increase the amount of contiguous undeveloped habitat. The DEIR should discuss the alternatives in the context of the Master Plan goal to promote smart growth and to preserve large amounts of contiguous habitat and wildlife corridors.

According to the EENF, Phase B involves construction of 1.7 million square feet of development space and 4,000 parking spaces, and will result in 80 acres of new impervious area. The DEIR should evaluate alternatives to minimize the amount of impervious area and consider options for parking such as shared parking, structured parking, pervious pavement, reserve areas, and providing parking underneath buildings.

The DEIR should provide more detailed information and analysis on the proposed Low Impact Development (LID), green building, and other sustainable design alternatives. The DEIR should include alternatives to avoid and minimize wetlands, wastewater, rare species, and other potential impacts as further detailed in the Scope below.

Wastewater and Nutrient Loading

Potential impacts of the project include degradation of water quality in the Wareham River estuary and Buzzards Bay as a result of nitrogen loading and related problems of eutrophication. As noted in many comment letters received, the Wareham river estuary is a state-listed impaired estuary due to excessive nutrients. The Town of Wareham municipal wastewater treatment facility (WWTF) is under state and federal mandates to limit nitrogen discharge. CZM and others have expressed concern that the financial investments by the Town of Wareham, and other efforts to address nitrogen pollution and protection of coastal waters, may be counteracted by unmanaged nitrogen loading from the proposed project.

The DEIR should include a cumulative analysis of nitrogen loading for all phases of the project (A, B, and C) that evaluates loadings from agricultural lands, wastewater and stormwater discharges. The DEIR should include a comprehensive nitrogen management plan for the entire project. If, at the time of the DEIR filing, a Final Record of Decision (FROD) has been issued granting a Phase One Waiver, the DEIR should include an update on wastewater infrastructure development and nitrogen offsets for Phase A, including a report on project compliance with the conditions of the FROD.

I acknowledge the comments received recommending that nitrogen impacts associated with the proponent's proposed River Run project (EEA# 13580, formerly referred to as the Wareham Road Mixed Use Development) be included in the cumulative impact analysis. I note that a Final EIR has recently been submitted for the River Run project and is under MEPA review, and that the scope for the Final EIR required the proponent to develop a nitrogen-neutral alternative and a nitrogen offset strategy for that project. Therefore, this Certificate does not direct the proponent to present a cumulative impact analysis for both projects.

The proponent should consult with MassDEP regarding the draft and final Total Maximum Daily Load (TMDL) and related technical reports for the Wareham-Agawam River watershed, which should be used to develop a comprehensive nitrogen management plan for the project. The proponent should continue to work closely with the Towns of Carver, Plymouth and Wareham, MassDEP, CZM, and environmental organizations on nutrient management issues during preparation of the DEIR. The DEIR should include an update on consultations with state, regional and local agencies, and a draft nitrogen management plan. The DEIR should discuss how the project will support the Town of Wareham's efforts to meet regulatory requirements for nitrogen loading.

The comprehensive nitrogen management plan should evaluate alternatives for wastewater treatment, including advanced technology and offsets for new loads. The DEIR should include a nitrogen-neutral alternative and a nitrogen offset strategy for the project and a detailed discussion of proposed mitigation. The proponent should consider best-available nitrogen removal technologies for wastewater, funding the sewering of existing unsewered areas, adopting agricultural best management practices, and other measures to reduce and offset nitrogen loading. The DEIR should evaluate alternative locations for the wastewater treatment facility and discharge areas, discuss the potential environmental impacts of each alternative, and explain why the preferred location(s) is being selected and others eliminated from further consideration

The proponent should work with the Town of Wareham on water conservation strategies in the service area to reduce flows and maximize utilization of the WWTF capacity. Water conservation could provide capacity for additional tie-ins of existing sources to offset new sources of nutrients in the watershed. The proponent should consider opportunities to promote higher levels of nutrient reduction at existing wastewater sources and consult with MassDEP prior to submission of the DEIR to discuss the groundwater discharge alternatives analysis, as recommended by MassDEP in its comment letter.

As part of the nutrient assessment and management plan, the DEIR should also discuss pollution issues relating to phosphorus loading in the watershed. The DEIR should include an assessment of the project's potential impacts on freshwater ponds and other water resources, and describe measures to avoid and minimize or mitigate impacts.

As noted in the MassDEP comment letter, any discharge of industrial wastewater (or medical wastewater, if applicable) to an on-site sanitary system is prohibited. The DEIR should discuss how any industrial and/or medical wastes will be managed and disposed of, identify applicable permits, and discuss how the project will comply with regulatory requirements.

The DEIR should discuss Phase B in the context of the Town of Wareham's Comprehensive Wastewater Management Plan (CWMP, EEA# 12562) and in response to MassDEP comments on this issue. The proponent should consult with MassDEP and the MEPA Office prior to submission of the DEIR regarding the possible requirement for a Notice of Project Change (NPC) for the CWMP and any additional evaluations that may be required.

Rare Species and Wildlife Habitat

NHESP, in its comment letter, indicates that the initial habitat assessment included in the EENF provides useful information that will be used to develop an appropriate mitigation plan, and that it may be possible to develop a mitigation plan without conducting endangered species surveys. NHESP indicates that it is not necessary to conduct endangered species surveys at this time. However, the proponent may be required to conduct these surveys in the future.

The DEIR should include a detailed habitat assessment for Phase B developed in consultation with NHESP. The DEIR should include a description of potential impacts to state-listed species. The DEIR should describe how the project will be designed to avoid and minimize, or mitigate impacts to state-listed species, and how it will qualify for a Conservation and Management Permit(s). As part of the alternatives analysis, the DEIR should consider alternative layouts (including a more concentrated development footprint) to avoid and minimize habitat fragmentation. The DEIR should discuss project phasing as it relates to permitting under the Massachusetts Endangered Species Act (MESA).

The proponent should consult with NHESP regarding habitat assessment and survey protocols for Phase C. I remind the proponent that the DEIR should include information and analysis to demonstrate that implementation of Phase B will not preclude options to avoid and minimize or mitigate impacts to state-listed species associated with future project phases.

Fisheries

As detailed in the comment letter from the Division of Marine Fisheries (DMF), the streams and ponds within the project site provide valuable habitat for a diverse assemblage of finfish and invertebrates, including three species of concern. DMF indicates that a prohibition on in-water turbidity producing activities from March 15 to October 1 is necessary to protect diadromous fish spawning and migration. The DEIR should respond to DMF comments and describe measures proposed to protect diadromous fish species, including the timing of project activities and measures to protect spawning, nursery and migration habitat. The DEIR should characterize the fish communities in the streams, including any rare species and anadromous fish for purposes of assessing potential impacts and any necessary mitigation.

The DEIR should describe proposed changes in water use associated with the project, including additional drawdowns and changes in cranberry bog operations, and evaluate potential impacts of the project on diadromous fish populations, including changes in stream water levels that might affect fish passage. The DEIR should provide information on proposed buffer zones along streams and ponds, and measures to avoid and minimize potential impacts to fisheries from runoff.

Wetlands

The DEIR should describe and quantify all wetland resource area impacts (including Riverfront Area) associated with the project, which should be based on a full wetlands delineation of lands on and in the vicinity of the proposed project site. Wetlands impacts

associated with on-site and off-site components of the project should be quantified in the DEIR. Buffer zone impacts should also be quantified. The proponent should complete the delineation process with the Wareham Conservation Commission and obtain an Abbreviated Notice of Resource Area Delineation (ANRAD) prior to filing the DEIR. As noted by MassDEP, certain alterations of existing cranberry bogs may be subject to jurisdiction of the Wetlands Protection Act. The DEIR should include any such alterations in the overall assessment and quantification of wetlands impacts.

The analysis of wetlands impacts and alternatives in the DEIR should address on-site and off-site components of the project and the DEIR should demonstrate how the preferred alternative will avoid and minimize or mitigate to the maximum extent feasible. The DEIR should thoroughly evaluate alternatives to avoid crossing and filling BVW. As noted by MassDEP, any BVW alteration in excess of 5,000 square feet that does not comply with the criteria for a Limited Project pursuant to 310 CMR 10.53 is prohibited. The proponent should explore planning board variances to achieve further avoidance and/or minimization of impacts as recommended by MassDEP, and review MassDEP's Wetlands Policy # 88-1 for guidance.

The DEIR should include the results of a Wildlife Habitat Evaluation, which is required in compliance with 310 CMR 10.60. The DEIR should describe how the project will comply with the "no adverse effect" performance standard for impacts to rare wetland wildlife habitat. For additional information, I refer the proponent to the MassDEP's Wildlife Habitat Protection Guidance for Inland Wetlands, dated March 2006, and Wetlands Policy # 06-1 *Procedures for Coordinated Review Under the Endangered Species and Wetlands Protection Regulations for State-Listed Wildlife in Wetlands.*

If the proponent is rebutting the presumption concerning the accuracy of the Federal Emergency Management Agency's 100-year flood plain boundary, the DEIR should include a copy of the flood study referenced in the EENF or any other flood study conducted, which must comply with the criteria at 310 CMR 10.57(2)(a)(3). The DEIR should also include information and analysis of Riverfront Area impacts as recommended by MassDEP, including information for any areas being considered by the proponent as previously developed Riverfront Area. The DEIR should include information to demonstrate the projects consistency with *Massachusetts River and Steam Crossing Standards: Technical Guidelines.*

The DEIR should include detailed replication plans for any proposed wetlands mitigation areas. I encourage the proponent to consider establishing Conservation Restrictions (CRs) in and around the freshwater wetlands found on-site, including Riverfront Area. The proponent should consult with MassDEP regarding any proposed wetlands CRs. The proponent should also consider potential restoration projects as recommended by The Nature Conservancy in its comment letter, to restore connectivity in terrestrial and aquatic habitats.

Stormwater and Low Impact Development (LID)

The DEIR should describe in detail how the project will comply with the Stormwater Management Standards, which have been recently revised and incorporated into the Wetlands Protection Act (WPA) regulations at 310 CMR 10.00 and 314 CMR 9.00.

The DEIR should provide a drainage analysis and a detailed description of the proposed stormwater management system for Phase B, and demonstrate how the project will meet MassDEP's Stormwater Management Regulations. The DEIR should describe changes to site topography, hydrology and drainage patterns as a result of the proposed land alteration and impervious area. The DEIR should demonstrate how the project is being designed to avoid and minimize any adverse impacts to site hydrology and wetland resources on and adjacent to the project site. Specific low impact development (LID) measures that will be incorporated in the project should be described. The DEIR should identify the size and location of stormwater system features on site plans. The layout of the stormwater system should be presented in the context of existing natural resources and proposed development areas to facilitate assessment of potential impacts and adequacy of the system. The DEIR should discuss ownership and long-term management of the stormwater system and include an operations and maintenance plan. The DEIR should include a stormwater pollution plan that details Best Management Practices (BMPs), pollutant elimination targets, and maintenance schedules and protocols. The DEIR should provide additional information to clarify whether the proposed project will include "Land Uses with a Higher Potential Pollutant Load" and "Critical Areas" with respect to stormwater quality control.

Potential adverse impacts to the Wareham River Watershed and upland ecosystem could be significantly reduced by the use of Low Impact Development (LID) site planning techniques and best management practices (BMPs). The DEIR should include a comprehensive detailed evaluation of opportunities to incorporate LID BMPs such as bioretention, permeable pavers, green roofs, rain barrels, rain gardens, grassed swales, stormwater infiltration systems, and alternative landscaping. I refer the proponent to the Commonwealth of Massachusetts Smart Growth/Smart Energy Toolkit for more information. (http://www.mass.gov/envir/sgtk.htm)

Air Quality

The DEIR should discuss air emissions and air quality permitting requirements for proposed industrial and manufacturing facilities. I refer the proponent to MassDEP's comment letter for additional information on applicable regulations. The proposed project may be subject to the Rideshare regulations (310 CMR 7.16), a clean air program that applies to employers with 250 or more daily employees. If the project may include facilities subject to this regulation, the proponent should consult with MassDEP for assistance. The DEIR should discuss project compliance with the Rideshare regulation, the Massachusetts Idling regulation (310 CMR 7.11) and other applicable air quality regulations. MassDEP recommends that the proponent participate in the MassDEP Diesel Retrofit Program and use ultra-low sulfur diesel to reduce particulate emissions during construction. The proponent should consult with MassDEP staff on this issue. The DEIR should include commitments to mitigate construction-period diesel emissions.

Mesoscale Analysis

The DEIR should include a mesoscale analysis for all phases of the project as recommended by MassDEP. I refer the proponent to MassDEP's comment letter for additional detail on the mesoscale analysis including the study area boundaries and the volatile organic compounds (VOC) and nitrous oxide (NO) emission analysis. If the mesoscale analysis indicates

an increase in VOC and NOx emissions as a result of the project, the DEIR should include commitments from the proponent to develop, implement or fund adequate mitigation measures to offset these increases to the maximum extent feasible.

Greenhouse Gas (GHG) Emissions

The DEIR should include an analysis of Greenhouse Gas (GHG) emissions and mitigation measures in accordance with the requirements of the MEPA GHG Emissions Policy and Protocol and as further detailed below. The proponent should consult with MassDEP regarding the modeling protocol prior to conducting the analysis. The analysis should include a cumulative assessment of GHG impacts and mitigation for all phases of the project (A, B, and C)

The EENF indicates that green power purchasing and renewable energy use is not economically feasible for the initial Phase A. However, the large scale of the overall project proposed (including Phases B and C) presents opportunities for incorporation of cost-effective innovative technologies that would significantly reduce projected GHG emissions from the project. The DEIR should include an energy/fuel consumption alternatives analysis examining the GHG impacts of the mix of renewable energy (wind, solar, geothermal), distributed generation such as combined heat and power, and traditional fossil fuel sources. Because scale is a significant factor in the cost-effectiveness of renewable energy, it is important that near-term decisions regarding energy sources for project phases that rely to a great extent on fossil fuel sources do not negatively impact long-term technical or economic viability of renewable sources. A comprehensive feasibility analysis for the entire project is consistent with the Special Review Procedure requirement for a cumulative impact assessment, and to ensure that implementation of earlier phases do not preclude options to avoid, minimize or mitigate environmental impacts associated with future phases.

The DEIR should include a comprehensive heating and cooling plan for the entire project (Phases A, B, and C) that considers clean and renewable fuels. The plan should consider all alternatives to fuel oil or electric heating and cooling for individual buildings. MassDEP has indicated in its comment letter that the project meets some of the basic screening criteria for district heating and cooling with the potential to add combined heat and power (CHP) to serve some of the electric load. A centralized heating and cooling plant has been shown to significantly reduce GHG emissions compared to individual boilers/chillers in each building or residential unit, and provides other benefits in terms of operations and maintenance, fuel flexibility, and increased usable building space. The proponent should consider fueling the central thermal plant by natural gas, biomass or geothermal. The DEIR should include an evaluation of the GHG emissions benefits and economic feasibility of this energy approach as recommended by MassDEP in its comment letter. If the analysis indicates that district heating and cooling is not feasible, the proponent should consider other options including extending a nearby natural gas line, and geothermal or wood pellet/biomass for individual buildings. I refer the proponent to the MassDEP comment letter for additional information and website resources.

I commend the proponent for selecting a Leadership in Energy and Environmental Design (LEED) certified architect to assist in the development of an energy efficient design for Phase A and encourage the proponent to continue this effort for future phases. Green

developments are a smart financial investment and at this early stage in the project, there are a multitude of opportunities for designing buildings and transportation management strategies that reduce energy consumption and substitute renewable energy sources for fossil fuel sources.

I note that one of the proposed measures in the EENF is to encourage tenants to adopt energy efficiency, renewable energy or transportation reduction measures. However, measures to "encourage" may or may not result in measurable GHG reductions and more specific commitments will be required in the DEIR. The DEIR should evaluate, and where appropriate, commit to adopting "green leasing" or other financial incentives to reduce GHG emissions and ensure that potential cumulative impacts of the phased development are avoided and minimized.

The GHG analysis as presented in the EENF, identified a range of mitigation measures. However, certain measures do not seem to be incorporated in the modeling charts. The charts also show a significant reduction in electric consumption over baseline conditions for "area lights", which is not explained. The DEIR and other future filings should include a more extensive analysis with a breakout of the project's consumption of electricity and fuel and the corresponding impact on Carbon dioxide (CO_2) emissions for each of the significant mitigation measures modeled. The report should identify highly sensitive elements of the analysis as recommended by MassDEP in its comment letter. The DEIR should describe the proponent's strategy for monitoring energy performance of buildings to ensure the energy systems function as designed over the long-term. The DEIR should include an analysis of GHG impacts relating to materials management. I refer the proponent to MassDEP's comment letter for additional information and guidance.

I note that the recently passed Green Communities Act requires that the International Energy Conservation Code (IECC) be adopted and fully integrated into the state building code. Therefore, the Massachusetts requirements will be changing. The proponent should be aware that the state code is expected to be revised by November 2009. The proponent's energy model must be optimized for the Massachusetts State Building Code in accordance with the MEPA GHG Policy and Protocol. In addition, I recommend that the proponent contact the New Construction Division of its electric utility provider, NStar, to take advantage of potential rebates available. Under the Green Communities Act, utilities will be greatly enhancing their energy efficiency rebate programs with expected program changes in 2010.

The DEIR should evaluate the feasibility of orienting new buildings and constructing roofs to support the added weight of a solar photovoltaic (PV) system for potential installation during project construction or at a future date. MassDEP and the Department of Energy Resources (DOER) have indicated that a life-cycle analysis, considering the support of subsidies through the Commonwealth Solar and Renewable Portfolio Standard (RPS) Program, could show an acceptable payback from the project. The DEIR should consider installation of a PV system under two scenarios: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party who will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. If neither scenario is considered economically feasible at this time, MassDEP and DOER recommend that the proponent consider PV installation for a future date and state its willingness to host a third-party-owned PV array under a favorable power

purchase agreement. I refer the proponent to the MassDEP comment letter for additional information.

The DEIR should include a progress report on the implementation of GHG mitigation measures for Phase A. The DEIR should justify the reasons for not implementing any measures that were proposed in the EENF.

Transportation

The DEIR should include additional information pertaining to Phase A and Phase B as requested in the comment letter from the Executive Office Transportation (EOT). The DEIR should include a schedule for implementation of transportation mitigation measures that corresponds with each development phase. The DEIR should include additional information to demonstrate that warrants are met where traffic signals are proposed and that construction of the improvements will be coordinated to minimize impacts along transportation corridors.

The DEIR should include a transportation study that is updated with revised traffic counts and a new traffic analysis for the study area to reflect any changes in the development program and/or the time lapse between submissions. The proponent should consult with the regional planning agencies regarding their transportation comments and address these in the DEIR. The transportation analysis should consider other proposed development in the vicinity of the project including the River Run project (EEA# 13580) and the Plymouth Rock Studio project as recommended by EOT. The DEIR should include conceptual plans for roadway improvements as further detailed in EOT's comment letter. The DEIR should include an update on the proposed Transportation Demand Management (TDM) program and commitments. The proponent should continue working with the Greater Attleboro-Taunton Regional Transit Authority (GATRA) to accommodate additional transit riders and maximize public transportation access to the site. The DEIR should include an update on discussions with GATRA and identify on-site amenities to facilitate transit bus access and incentives to encourage usage.

The DEIR should include additional detail to respond to MassDEP comments on the proposed TDM program. The DEIR should discuss in detail implementation of a Commuter Tax Benefit Program, Transportation Management Association (TMA), Guaranteed Ride Home Program, and Rideshare Matching Program. The DEIR should evaluate additional measures to reduce drive-alone trips to the project including incentives for walking, bicycling, transit and carpool use, and traffic calming and shuttle services, as recommended by MassDEP in its comment letter. The DEIR should assess the feasibility of a shuttle service as recommended by MassDEP. The DEIR should include clear commitments to specific TDM measures. I encourage the proponent to commit to developing contracts with tenants to ensure implementation of additional TDM measures to reduce vehicle trips.

The proponent should continue to work with EOT to monitor and assess on-site and off-site transportation infrastructure that will be required for Phase C of the project. The DEIR should discuss the results of the consultations and assessments.

Water Supply

Potable water services and fire protection for Phase B of the project will be provided by the Wareham Fire District (WFD). It appears that the potable water demand can be accommodated within the WFD's existing Water Management Act (WMA) Permit. The proposed withdrawal for Phase C will require an application for a new WMA permit. MassDEP indicates that the WFD will be requesting additional volume to accommodate projected increases in demand. To the extent feasible, the proponent should provide ongoing support to the WFD in developing water demand projections for the project.

The DEIR should include an analysis of the impacts associated with the proposed new water mains. The DEIR should identify the location of proposed irrigation wells and include an estimate of proposed groundwater withdrawals for irrigation and an evaluation of impacts, including any potential wetlands impacts. The DEIR should describe proposed re-use of treated water and other sustainable water conservation practices, and quantify expected reductions in water demand.

The DEIR should discuss the consistency of the project with the Plymouth/Carver Aquifer Action Plan (2007), the Plymouth/Carver Aquifer Regional Open Space Plan (2008), and the Plymouth/Carver Aquifer Advisory committee's bylaw recommendations for Aquifer communities (2008). The DEIR should describe how the project will maximize water conservation and aquifer recharge, and minimize surface and groundwater discharge of nutrients and pollutants.

Federal Consistency Review

The proponent should consult with the Office of Coastal Zone Management (CZM) regarding its federal consistency review. The DEIR should describe how the proposed project will be consistent with CZM's enforceable program policies.

Historical and Archaeological Resources

The DEIR should include a single comprehensive cultural resources section that expands upon the EENF as further detailed in the comment letter from the Massachusetts Historical Commission (MHC). MHC has requested additional information to clarify location of proposed development in relation to archaeological testing sites as previously reviewed by MHC. The proponent should continue consultations with MHC during DEIR preparation. MHC has recommended that the proponent meet with the Lead Federal Agency for the Section 106 review to coordinate and plan the consultation process.

Construction Period Impacts

The DEIR should include a Construction Management Plan (CMP) describing project activities and their schedule and sequencing, site access and truck routing, and best management practices (BMPs) that will be used to avoid and minimize adverse environmental impacts. The CMP should address potential impacts and mitigation relating to land disturbance, noise, dust,

odor, nuisance, vehicle emissions, construction and demolition debris, and construction-related traffic. The CMP should discuss plans for reuse and recycling of construction materials. The CMP should include an erosion control component to address protection of water quality and wetlands resources.

I strongly encourage the proponent to commit to participation in the MassDEP Diesel Retrofit Program and to use ultra low sulfur diesel (ULSD) in off-road engines. The DEIR should describe how the proponent will minimize construction-period diesel emissions to address concerns relating to fine particulate matter ($PM_{2.5}$) and related health impacts. The DEIR should also discuss measures to ensure compliance with any applicable solid waste, air quality control and disposal site regulatory requirements.

Proposed Mitigation and Section 61 Findings

The DEIR should include a separate chapter on mitigation measures, which should include proposed Section 61 Findings for all state permits and a summary table of all mitigation proposed. The mitigation chapter of the DEIR should describe proposed mitigation measures, contain clear commitments to mitigation and a schedule for implementation, and identify parties responsible for funding and implementing the mitigation measures.

Responses to Comments

To ensure that the issues raised by commenters are addressed, the DEIR should include a responses to comments. This directive is not intended to, and shall not be construed to, enlarge the Scope of the DEIR beyond what is expressly identified in this Certificate. I defer to the proponent in developing the format for this section but it should provide clear answers to the questions raised and additional information and analysis as necessary to respond to the comments.

Circulation and Public Outreach

The DEIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should be sent to the list of "comments received" below. A copy of the DEIR should be made available for public review at the Carver, Plymouth and Wareham Public Libraries. I note that the proponent has agreed to notify those on the EENF distribution list of project informational meetings as part of its public outreach plan. The proponent should expand its meeting notification list to include all who commented on the SRP and EENF and those who attended the MEPA site visit and public consultation. The DEIR should include an update on the proponent's public outreach activities.

September 12, 2008
DATE

Ian A. Bowles, Secretary

Comments received

8/01/08	Wareham Fire District
8/13/08	Massachusetts Historical Commission
8/28/08	Town of Plymouth
8/29/08	Cape Cod Canal Region Chamber of Commerce
8/29/08	Wareham Ford
9/04/08	Plymouth/Carver Aquifer Advisory Committee
9/04/08	Carver Conservation Commission
9/04/08	Division of Marine Fisheries
9/04/08	E.L. Morse Co., Inc.
9/04/08	Plymouth Area Chamber of Commerce
9/05/08	Town of Wareham
9/05/08	Cape Cod Cranberry Growers' Association
9/05/08	David Beluche
9/05/08	Department of Environmental Protection, Southeast Regional Office
9/05/08	Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program
9/05/08	Buzzards Bay National Estuary Program
9/05/08	The Nature Conservancy
9/05/08	The Coalition for Buzzards Bay
9/05/08	Southeastern Regional Planning and Economic Development District
9/08/08	Office of Coastal Zone Management
9/08/08	Plymouth Area Chamber of Commerce
9/10/08	Old Colony Planning Council
9/10/08	Executive Office of Transportation

IAB/AE/ae

No Hard Copy Signed ?

File missing From Stephen 12/10

MEMORANDUM

TO: Aisling Eglington, Environmental Reviewer, MEPA Unit

THROUGH: Jonathan Hobill, Acting Deputy Regional Director, Bureau of Resource Protection
Brenda Chabot, Deputy Regional Director, ADMIN
David Johnston, Deputy Regional Director, BWP
Millie Garcia-Serrano, Deputy Regional Director, BWSC
Gary Moran, Regional Director

CC: Elizabeth Kouloheras, Chief, Wetlands
Jeffrey Gould, Chief, Water Pollution Control
Team Leader, Buzzards Bay Watershed
Frank Mezzacappa, Water Pollution Control
Joe Shepherd, Water Pollution Control
David Burns, Municipal Facilities
Richard Rondeau, Chief, Water Supply
Jan Drake, Water Supply/Water Management Act
Richard Keith, Chief, Municipal Services
Pamela Truesdale, Team Coordinator, Buzzards Bay Watershed
David Ellis, Chief, Solid Waste Management
Dan Connick, Solid Waste Management Program
John Winkler, Chief, Air Quality/Permitting
Gerard Martin, Chief, Site Management
Julia Sechen, Site Management Program
Jennifer Viveiros, Green House Gas Emissions
David Ferris, Acting Program Director, BRP-DWM-WWP
Phil Weinberg, Program Manager, OPS-DC

FROM: Sharon Stone, SERO MEPA Coordinator

DATE: September 5, 2008

RE: ENF EOEEA #13940A – WAREHAM/CARVER/PLYMOUTH – ADM Tihonet Mixed Use Development Tihonet Road, Wareham

****

"For Use in Intra-Agency Policy Deliberations"

The Southeast Regional Office of the Department of Environmental Protection (MassDEP) has reviewed the Environmental Notification Form (ENF) for the proposed ADM Tihonet mixed-use development project to be located on Tihonet Road in the Towns of Wareham, Carver and Plymouth, Massachusetts (EOEEA #13940A). The project proponent provides the following information for the project:

"The proponent (ADM Development Services LLC) has submitted an Expanded Environmental Notification Form (ENF) in accordance with the Secretary's Certificate Establishing a Special Review Procedure (SRP), dated January 29, 2007. The proposed project consists of the phased development of a 6,000-acre project site in the towns of Wareham, Carver and Plymouth, which is propose for development over the next 25 years or more. The proponent is focusing its initial development efforts on the Business Development Overlay District (BDOD) in Wareham, which includes the proposed Tihonet Technology Park. The Expanded ENF includes baseline data and a concept plan for the entire development, as well as more detailed information on the initial development plans proposed for the BDOD and a 6.4-acre parcel located off Lou's Avenue in Wareham.

The Expanded ENF includes a request for a single review document for Phase A to allow this initial development (approx 25 acres) to proceed to permitting prior to completion of an EIR for Phase B (approx. 1,140 acre BDOD) or Phase C (the remainder of the 6,000-acre site). The ENF also requests an amendment to the SRP to account for changes in the proposed Phase A since the filing of the SRP request. Phase A includes approximately 115,000 square feet (sf)of commercial development (office and light manufacturing) on 18.4 acres within the Tihonet Technology Park and a 40,000 sf medical building located on a 6.4 acre parcel off Lou's Avenue. Phase B (the BDOD) includes approximately 1.7 million sf of development. The project requires a range of state, local and federal permits and approvals."

The Buzzards Bay Watershed Team has reviewed the document and indicates the following comments.

BUREAU OF RESOURCE PROTECTION

Wetlands and Waterways Comments

The project proponent has stated that in Phase A1 and A2 no work shall occur in Wetland Resource Areas. If work is to occur within the buffer zone to Wetland Resource Areas then the potential for construction impacts to wetlands as specified in 310CMR10.53(1.) should be addressed in any Notice of Intent filing with the local Conservation Commission. Compliance with 310CMR10.05(6)(k)-(q) of the Stormwater Management Standards is also required.

Any Bordering Vegetated Wetland (BVW) alterations in excess of 5,000 SF that do not comply with the criteria of a Limited Project as per 310CMR 10.53 is prohibited. Since the proponents chosen " moderate alternative" for Phase B entails multiple wetland and stream roadway crossings it is the Program's opinion that the Draft Environmental Impact Report (DEIR) should include a subset of on-site and off-site alternatives analysis' that will further refine and provide compliance with the "avoid , minimize and mitigate standard" within the chosen alternative.

Projects proposed as a limited project per 310CMR 10.53(e), besides use of retaining walls, etc. should consider requests for planning board variances to achieve further

avoidance and/or minimization of impacts. The proponent is advised to review DEP Wetlands Policy Number 88-1 for further guidance. In fact, due to the size of this undeveloped tract of land the need to cross or fill BVW to access upland areas will be closely evaluated by MassDEP during its review and should be thoroughly explored during the DEIR process. Secondary emergency access roads must also meet the "avoid, minimize, mitigate" standard.

Due to the potential extent of bordering land subject to flooding, bank, land under water and riverfront area that may be altered by Phase B a Wildlife Habitat Evaluation, in compliance with 310CMR10.60, will be required and at a minimum the outline of the content of such an evaluation should be provided within the DEIR. Please refer to the Mass.DEP's Wildlife Habitat Protection Guidance for Inland Wetlands, dated March 2006. Phase B must also comply with the no adverse effect performance standard for impacts to rare wetland wildlife habitat sites. The DEP encourages the proponent to continue to work closely with the Natural Heritage and Endangered Species Program (NHESP) so that upon submittal of any future Notice of Intent a "no short or long term adverse effect" statement may be obtained from NHESP. Please refer to DEP Wetlands Policy Number 06-1- Procedures for Coordinated Review Under the Endangered Species and Wetlands Protection Regulations for State-Listed Wildlife in Wetlands.

The expanded ENF states that Stormwater will be managed in compliance with the MassDEP Stormwater Standards at 310CMR10.05 (6)(k)-(q). The Draft EIR should include information to address whether or not the proposed development or portions thereof may be considered "Land Uses with a Higher Potential Pollutant Load" and whether the fisheries associated with the various perennial streams are coldwater fisheries or anadromous/catadromous fish runs and therefore considered "Critical Areas" with respect to stormwater quality control.

Alterations of "man-made" water features used for irrigation of existing cranberry bogs may be permissible for Normal Maintenance and Improvement of Land in Agricultural Use (310CMR10.04). However, please be advised that alterations of these water features for development purposes may be considered alterations subject to jurisdiction of the Wetlands Protection Act.

The expanded ENF discusses Conservation Restrictions that may be developed and implemented for the protection of Priority Rare Wildlife Habitat. The MassDEP encourages the proponent to consider establishing Conservation Restrictions in and around the Freshwater Wetlands found on-site, including Riverfront Area. It is recommended that any Wetland Conservation Restrictions be discussed with and reviewed by MassDEP prior to or at a minimum during the permit application process.

MassDEP agrees, that at a minimum, the proposed project must comply with the performance standards sited on page 4-32 of the EENF to protect the interests of the Wetlands Protection Act. Relative to the boundary of Bordering Land Subject to Flooding, the flood study noted on page 4-15 (or any other flood studies to be conducted), if meant to rebut the presumption concerning the accuracy of the Federal

Emergency Management Agencies 100 year flood plain boundary, should be submitted as an Appendix to the DEIR or with the Notice of Intent (NOI) application. In order to be considered, any such flood study must comply with the criteria at 310CMR 10.57(2)(a)(3).

The DEP suggests that during development of any BVW replication plans, the proponent review and utilize MassDEP's "Massachusetts Inland Replication Guidelines," dated March 2002.

In all Phases of development at the site if the proponent plans to utilize the provisions for redevelopment of previously developed Riverfront Area, as per 310CMR10.58(5), on-site analysis, identification and calculation of square footage of area to be considered previously developed RFA must be provided to the issuing authority . MassDEP recommends that if possible this information be developed for inclusion in the DEIR for Phase B. It should also be included in the Phase A notices of intent if it is to be utilized for that phase of the development.

New or improved permanent stream crossings should be designed to meet the latest version of the "Massachusetts River and Stream Crossing Standards: Technical Guidelines."

If you have any questions regarding the Wetlands comments listed above, please call Liz Kouloheras at (508) 946-2810.

Water Supply Program Comments

Wareham Fire District Capacity

The proponent states that Phases A and B of site development will obtain their water from the sources operated by the Wareham Fire District in Wareham, MA. The Department offers an update to Section 3.7.10 of the ENF, where the proponent notes that the Wareham Fire District (WFD) currently has a total authorized volume of 1.87 MGD. This was true up until May 31, 2006, after which the WFD's Water Management Act (WMA) permit increased their total authorized volume to 1.95 MGD through the fourth and final permit period, ending May 31, 2011.

In its 2007 5-year review of the WFD's compliance with the conditions of its permit, the Department noted that the WFD, in 2006, operated at a margin of 0.30 MGD less than its currently authorized 1.95 MGD.

New Source Development

Water use projections for Phase C of site development are described by the proponent only in general terms at this time. The proponent has indicated, however, that development of multiple new sources will be required to provide adequate capacity.

As noted in the ENF, any new site development will require progress of the new source through the Department's New Source Approval process, initiated by a Request for a Site Exam.

Water Management Act (WMA) Considerations
The proponent also notes that the withdrawal volume required for Phase C is anticipated to exceed the 0.1 MGD threshold beyond which a WMA permit is required, thus necessitating the application for a new WMA permit in the Buzzards Bay Basin. Application forms for both new source approval and WMA permits are located on the Department's website.

The expiration date of all WMA permits in the Buzzards Bay is May 31, 2011. The WFD has indicated to the Department that, although it currently has adequate capacity to meet demand, it will be applying for new demand projections in support of a request for additional volume to accommodate projected increases in demand due to system expansion. To the extent possible, the proponent should provide ongoing support to the WFD in developing water demand projections as the development phases of the ADM Tihonet site proceed.

If you have any questions regarding the Water Supply/Water Management Act comments listed above, please call Janice Drake at (508) 946-2841.

Waste Water Management
This table summarizes wastewater flows, as the project is described in the EENF:

Tihonet Mixed Use Development Proposed Wastewater Flows

Phase A1 = 115,200 sq.ft. office and light manufacturing	8,000 gpd on Title 5 with enhanced nitrogen removal	(EENF p.3-18)
Phase A2 = medical office space	7,000 gpd on Title 5 with enhanced nitrogen removal; possible tie-in to sewer, if rehabilitated	(EENF p.3-45)
Phase B = 1.7 millions sq.ft. commercial	32,000 gpd to Wareham WWTP 89,000 gpd on GW Permitted facilities	(EENF p.4-29, 4-79)
Phase C = 1850 housing units	670,000 gpd probably on GW Permitted facilities	(EENF p.5-15)

MassDEP will treat Phase A1and A2 as non-contiguous parcels based upon the limited information provided in the EENF. Based on that assumption, a ground water discharge permit will not required for their development so long as either parcels' ground water discharge does not exceed 10,000 gpd. The Proponent has acknowledged that nitrogen reducing technology is necessary for the waste water treatment systems for both parcels.

Proposed Sewer Connections

It is noted in the approved Town of Wareham Comprehensive Wastewater Management Plan/Single Environmental Report (EEOA #12562) that the purpose of the recently

upgraded capacity of the Wareham POTW was for the 12 proposed sewer needs areas and infilling within existing sewered areas. For those areas outside the identified needs areas and to sewer the moderate growth areas within the needs areas, another comprehensive planning effort would be necessary. The section describing compliance with EO#385 states, "It is the understanding of the Board (Board of Sewer Commissioners) that any other areas requesting or demonstrating a need for sewers could only obtain approval after all of the 12 sewer areas are connected"

It is unclear if the location of Phase A2 is considered within the infill areas. If it is not, a Notice of Project Change may be required for the CWMP (EOEA#12562) and, if required, a revised CWMP would need to be approved prior to connection to the Town's POTW. Phase B is located outside of any of the defined sewer needs areas and it is unclear if any portion of Phase B is in an infill area. If it is not, a Notice of Project Change and revised CWMP would also be required. If an NPC/CWMP is required, an evaluation should occur to determine if other newly identified needs areas exist or other areas of the watershed could be connected to the POTW to more effectively remove nutrients from the watershed.

The Wareham Wastewater Treatment Facility has a design flow of 1.56 Million gallons per day (MGD) and is currently treating an average range of 0.92-1.0 MGD. After all the identified needs areas have been sewered, projected flows could be at of above 80 percent of the design capacity. The most recent NPDES permit for Wareham includes the following condition.

"If the average annual flow in any calendar year exceeds 80 percent of the facility's design flow, the permittee shall submit to MassDEP by March 31 of the following calendar year its plan describing further flow increases and describing how it will maintain compliance with the flow limit and all other effluent limitations and conditions."

Groundwater Discharge

From a water quality perspective, a critical aspect of the proposed project is that it entails some 6000 acres which are substantially within the sub-watersheds that drain to the Wareham River Estuary. The Wareham River Estuary is one of 89 estuaries being evaluated under the Massachusetts Estuary Project to assess water quality conditions. Based on current water quality assessment data collected by the Department, the Wareham River Estuary has already been determined to be impaired a result of excessive nutrients

In the EIR for Phase B, the project Proponent should be required to conduct an alternatives analysis that evaluates different mean the project may employ to mitigate nitrogen impacts to the Wareham River Estuary or nutrient impacts to other impaired waters. It would appear the project phases taken separately, as well as the project as a whole covered by the Special Review Procedure, will add nutrients to receiving waters which are already listed on the Department's 303(d) list of impaired waters. By way of example, there may be significant existing sources not covered by the Wareham

CWWMP that the Proponent could, in cooperation with the Town, provide for reductions in nutrients from existing sources. The Town of Wareham has already undertaken a $50 million program to improve water quality by upgrading its collection and wastewater treatment system to serve its prioritized existing sources. By working with the Town of Wareham and identifying potential mitigation strategies early in the process, cost effective solutions to regional water quality concerns can best be addressed. Minimization and mitigation strategies may be available that could totally offset any new inputs of nutrients, including phosphorus and nitrogen, into the affected sub-watersheds. Concerning any possible capacity limitations at the Wareham WWTP, the proponent could work with the Town on water conservation strategies in the service area to reduce flows and maximize the utilization of the WWTP capacity. Water conservation could provide capacity for additional tie-ins of existing sources for offsets of new sources of nutrients from new development in the watershed.

Alternatively, the Proponent could find an existing wastewater source that could treat on-site to a higher level for nutrient reduction and offset the increases from the Proponent's new sources. Moreover, Makepeace, as a large agricultural enterprise in the region, has potential alternative approaches to mitigate nutrient impacts by demonstrating measurable nutrient reductions from modified agricultural operations. Quantification, implementation, and verification of agricultural best management practices and the impact on nutrients are very different than managing wastewater loads, but it could be explored. The Department recommends the proponent meet in advance of the submission of the EIR to discuss the groundwater discharge alternatives analysis.

Industrial Wastewater (IWW)

Any discharge of industrial wastewater (*or medical wastewater, if applicable*) to an on-site sanitary system is prohibited. If any occupant of the project will generate industrial wastewater, MassDEP and/or local regulations and permitting may apply.

Construction Activities - EPA

The proponent correctly identifies that the project construction activities may disturb one or more acres of land and therefore, may require a NPDES Stormwater Permit for Construction Activities. The proponent can access information regarding the NPDES Stormwater requirements and an application for the Construction General Permit at the EPA website: http://cfpub.epa.gov/npdes/stormwater/cgp.cfm

BUREAU OF WASTE SITE CLEANUP

Based on the information provided in the ENF, the Bureau of Waste Site Cleanup (BWSC) searched its database for disposal sites and release notifications. There are numerous former disposal sites located along the boundary of the project as identified in the Expanded Environmental Notification Form. There are five former disposal sites within the proposed boundaries. Release Tracking Number (RTN) 4-17747, located at 155 Tihonet Road, off Cranberry Road, in Carver submitted a Class A1 RAO on May 15, 2003. RTN 4-13693, located on Tihonet Road, off Farm to Market Road in Wareham submitted a Class B1 RAO on June 29, 2001. RTN 4-18228, located on Federal Road, near #60 Federal Road, in Carver, submitted a Class A1 RAO on January 27, 2004. RTN 4-14092, CMW Landfill, located on Federal Road in Carver, submitted a Class A1 RAO

on September 30, 1998. RTN 4-755, Tremont Nail, located at 6-8 Elm Street, in Wareham, submitted a Class A2 RAO on November 2, 2000.

The Project Proponent is advised that, if oil and/or hazardous material is identified during the implementation of this project, notification pursuant to the Massachusetts Contingency Plan (310 CMR 40.0000) must be made to MassDEP, if necessary. A Licensed Site Professional (LSP) may be retained to determine if notification is required and, if need be, to render appropriate opinions. The LSP may evaluate whether risk reduction measures are necessary or prudent if contamination is present. The BWSC may be contacted for guidance if questions regarding cleanup arise.

If you have any questions regarding the BWSC comments listed above, please call Julia Sechen at (508) 946-2791.

BUREAU OF WASTE PREVENTION
Resource Conservation and Recovery Act (RCRA)
If any occupant of the project will generate hazardous waste and/or waste oil, that entity must register with the MassDEP or EPA to obtain a permanent identification number for legally generating and managing regulated waste.

Solid Waste Management (SWM) Program Comments
The Solid Waste Management Program staff has reviewed the document and notes that information presented in the ENF indicates that no thresholds have been triggered for SWM and therefore, no SWM permits will be required. In addition, SWM indicates the following comments.

Building Demolition and Asbestos Containing Waste Material: The proposed project includes the demolition of buildings and other structures which may contain asbestos. The project proponent is advised that demolition activity must comply with both Solid Waste and Air Quality Control regulations.

- In accordance with the air quality regulations at **310 CMR 7.09(2),** the proponent must submit an **AQ-06** form to MassDEP for all construction projects to comply with the Air Quality Regulations at 310 CMR 7.00. The proponent should suggest measures to alleviate dust, noise, and odor nuisance conditions, which may occur during the demolition. If the facility was constructed prior to 1980, the proponent should contract a State licensed asbestos consultant to conduct an asbestos survey of the facility and the facility components prior to conducting any demolition or renovation activities. As part of the asbestos survey, samples must be taken of all suspect asbestos containing building materials and sent to a State certified laboratory for analysis.

- Should any of the sampled materials contain at least 1% of asbestos by weight, the proponent must hire a State licensed asbestos abatement contractor to remove the asbestos containing material(s) from the facility or

facility component prior to demolition or renovation. The Massachusetts Department of Labor and Work Force Development, Division of Occupational Safety (DOS) is the agency responsible for licensing and regulating all asbestos abatement contractors, designers, inspectors and analytical laboratories in the state of Massachusetts. The proponent and contractor will be responsible for submitting an **ANF-001** notification form to MassDEP at least ten (10) working days prior to beginning any demolition or renovation of the asbestos containing materials. The removal of asbestos from the buildings must adhere to the special safeguards defined in the Air Quality Regulations as required at 310 CMR 7.15. A waiver to the notification provisions contained at **310 CMR 7.15(1)(b)2.a. and b.**, may be granted by MassDEP's regional offices in the case of an emergency; as determined by MassDEP. For the southeast regional office please call 508-946-2844.

- Pursuant to **310 CMR 19.061(6)(b),** the disposal of asbestos containing materials, except for vinyl asbestos tile (VAT), and asphaltic-asbestos felt and shingles, within the Commonwealth must be at a solid waste facility specifically approved by MassDEP to accept asbestos containing waste materials. For further information regarding the removal, handling and disposal of non-friable asbestos containing materials, (i.e., vinyl asbestos tile, asbestos cement shingles and asphaltic-asbestos felt and shingles, etc.) the proponent should refer to the MassDEP, "Policy Concerning Non-Friable Asbestos-Containing Materials, Bureau of Waste Prevention **Policy # BWP-96-012**, Revised December 11, 2000" and "Asbestos Cement Shingles Guidance Document, February 2006". This policy can be found on-line at the Mass/DEP website: www.mass.gov/dep. As per **310 CMR 19.061(6)(b),** no asbestos containing material; including VAT, asphaltic-asbestos felts or shingles; may be disposed at a solid waste combustion facility.

- Asphalt, brick and concrete (ABC) rubble, such as the rubble generated by the demolition of buildings must be handled in accordance with Massachusetts solid waste regulations. These regulations allow and MassDEP encourages the recycling/reuse of ABC rubble. The proponent should refer to MassDEP's Information Sheet entitled "Guide To Regulations for Using or Processing Asphalt, Brick and Concrete Rubble, revised February 2000" that answers commonly asked questions about ABC rubble and identifies the provisions of the solid waste regulations that pertain to recycling/reusing ABC rubble. This policy can be found on-line at the Massachusetts Department of Environmental Protection website: www.mass.gov/dep.

If you have any questions regarding the Solid Waste Management Program comments above, please contact Dan Connick at (508) 946-2884.

Air Quality Permitting Program Comments

Many industrial and manufacturing development activities have air emissions associated with them and require air quality permitting from MassDEP before construction and/or operation. Facility heating may also require MassDEP air quality permitting.

The installation and operation of certain fuel burning equipment (boilers, emergency generators, etc) may be exempt from Plan Approval requirements contained in 310 CMR 7.02(4) or (5). To determine if permitting is required for fuel burning equipment please refer to:

- 310 CMR 7.26(30) Boilers – Applicability
- 310 CMR 7.26(40) Engines and Combustion Turbines – Applicability

Construction and operation activities shall not cause or contribute to a condition of air pollution due to dust, odor or noise. To determine the appropriate requirements please refer to:

- 310 CMR 7.09 Dust, Odor, Construction, and Demolition
- 310 CMR 7.10 Noise

In addition, ADM should explore the feasibility of having a natural gas pipeline service the area. This will provide a reduction in Green House Gas (GHG) emissions over oil fired devices and could provide an overall long-term cost savings to the project's tenants.

If you have any questions regarding the Air Quality comments listed above, please call John Winkler at (508) 946-2779.

Greenhouse Gas Emissions

The project is subject to the MEPA Greenhouse Gas Emissions Policy and Protocol ('the Policy'). A pre-filing meeting was held at the MEPA office on June 2, 2008, where it was proposed that a simplified Greenhouse Gas emission evaluation be prepared for Phase A. This was in part due to the conceptual nature of the final building design and the relatively small percentage Phase A represents of the total project. The EENF included a GHG analysis, using the EQUEST model to compute direct and indirect CO_2 emissions from stationary sources. The GHG evaluation was done for each the two phases that make up Phase A: Phase A1 and Phase A2. Phase A1 is estimated to generate 887 tons per year of CO_2 emissions from stationary sources. This reflects a reduction from the base case of 1063 tons per year of CO_2 emissions for direct and indirect stationary sources of about 16.6 percent. Phase A2 is estimated to generate 482.7 tons per year of CO_2 emissions from stationary sources. This reflects a reduction from the base case of 686.5 tons per year of CO_2 emissions for direct and indirect stationary sources of about 29.7 percent.

Figures 3.5.9.2 and 3.10.9.2 identify anticipated measures that are to be incorporated into the proposed project. However, certain measures, such as "Use water conserving fixtures that exceed building code requirements" do not seem to be accounted for in the modeling charts. Similarly, a footnote in chart indicates that a 10% reduction was inputted to account for the hot water and misc equipment, but that does not appear to be reflected in

the comparison between baseline and post-mitigation emissions. At the same time the modeling charts show a significant reduction in the electric consumption over baseline for 'area lights' (46% for Phase A1 and 35% for Phase A2) compared with other projects. Submittals for the subsequent phases should include a more extensive analysis that should include a breakout of the project's consumption of electricity and fuel and the corresponding impact on CO2 emissions for each of the significant mitigation measures modeled. Where the final design elements are not determined, and that element has a substantial impact on the amount of reduction, and therefore its cost effectiveness, the report should reasonably identify those highly sensitive elements.

A project at this early stage of development provides a multitude of opportunities for designing buildings and transportation management measures that reduce energy consumption and substitute renewable energy sources for fossil fuel sources. MassDEP and DOER believe green developments are a smart financial investment. With a growing market demand for facilities that have reduced carbon footprints, rents are being driven higher for the US Building Council's Leadership in Energy and Environmental Design (LEED) certified buildings and Energy Star buildings than rents for less energy-efficient buildings, and occupancy rates are reported to be higher too by the CoStar Group, which released a study on rents, sales, and occupancy for energy efficient buildings in their commercial property database. The proponent has identified the selection of a LEED certified architect to assist in the development of an energy efficient design for Phase A.

As explained in the MEPA Greenhouse Gas Emissions Policy and Protocol, the proponent's energy model must be optimized for the MA State Building Code, which is the baseline alternative for energy use in calculating GHG emissions. It should be noted that the recently passed Green Communities Act requires that the International Energy Conservation Code (IECC) be adopted and fully integrated into the state building code and therefore the MA requirements will be changing. It is expected that the MA code will be revised by November to reflect the 2006 amendments to the IECC and 2009 amendments will follow within the design period contemplated for full build out.

As the project moves forward, it is recommended that the project proponent contact the New Construction division of its electric utility provider, Nstar, to take advantage of any potential rebates available for the installation of highly energy efficient equipment. Under the Green Communities Act, utilities will be greatly enhancing their energy efficiency rebate programs with expected program changes in 2010.

For Phase A, the EENF identifies several worthwhile building design and operation mitigation measures for the project in Tables 3.5.9.2 and 3.10.9.2. These measures are identified as "anticipated" measures. The project proponent should seriously consider incorporation of all of these measures. The life-cycle energy cost savings with the implementation of many of these measures provide short-term paybacks. For example, insulation is very cost effective, and contributes significantly towards a building's envelope and has the potential to yield the largest energy savings for building operations. Therefore, the highest R-value insulation should be used. MassDEP suggests that if the waiver is approved, it be conditioned upon the implementation of these measures with

progress monitored or revisions justified through the subsequent EIR filings. Looking forward to the EIR, having the proponent indicate only that it will "encourage" tenants to adopt energy efficiency, renewable energy or transportation reduction measures should not be considered an adequate response to ensure that the potential cumulative impacts of piecemeal development is avoided. Encouragement can run the gamut from an in-passing conversation to financial incentives negotiated as part of the lease. The proponent should be obliged to evaluate and where appropriate adopt so called "green" leasing or other financial incentives

The EENF did not identify any renewable energy projects. Instead, the project considered green power purchasing and provided estimated greenhouse gas reductions, but noted that the expected financial burden placed on building tenants for the smaller, Phase A of the project would make this infeasible. The project proponent could evaluate purchasing a smaller amount that would not result in as much of a financial burden to the building tenants.

With respect to renewable energy projects, the project proponent is encouraged to assess the incorporation of PV on the buildings for the remaining Phases. At a minimum, buildings should be oriented and roofs should be constructed to support the added weight of a solar photovoltaic (PV) system for potential installation during project construction or at a future date. Considering the support of subsidies through the Commonwealth Solar and MA Renewable Portfolio Standard programs, a life-cycle cost analysis could show the installation of a PV system resulting in an acceptable payback for the project. Two scenarios for consideration should be: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party that will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. If neither of these scenarios is economically feasible at this time, the project should continue to consider the opportunity for installing PV at a future date and state their willingness to host a third-party owned PV array under a favorable power purchase agreement, therefore, the reason for orienting the buildings and constructing the roofs to support a PV installation. With the continuous advances in technology and expected increases in electricity prices, the payback for the installation of PV is only expected to decrease in the future. The following website provides information on the Commonwealth Solar program and tools for performing basic life cycle cost analyses:
http://www.masstech.org/renewableenergy/commonwealth_solar/index.html#

The additional Phases also present opportunities for incorporation of cost-effective, innovative technologies that provide significant reductions in greenhouse gas emissions for the project. Unfortunately, the EENF did not submit any proposals for what it intended or planned to achieve in these later phases, including the nearer term development proposed for the 10 acres within the General Commercial District on Rt. 28 at Lou Avenue. The EIR should provide a energy /fuel consumption alternatives analysis examining the GHG impacts on the mix of renewable (wind, solar, geothermal), distributed generation such as combined heat and power), and traditional fossil fuel sources that are feasible to be implemented for the project. Because scale is so important

to the cost-effectiveness of renewable energy, it is important that near term decisions on energy sources for project build out components that rely to a greater extent on fossil fuel sources not negatively impact the long term technical or economic viability of renewable sources. Such an analysis is consistent with the SPR commitment to avoid adverse cumulative impacts.

The EENF noted that fuel for the operation of space heating for the Phase A buildings would likely be supplied by oil, as natural gas is not currently available. The project proponent needs to assess a comprehensive heating and cooling energy plan for the entire project (phases A, B and C) that considers cleaner fuels. The plan should consider all alternatives to fuel oil or electric heating and cooling for individual buildings. As a new, clustered, mixed-use development, the project meets some of the basic screening criteria for district heating and cooling, and, depending upon the phased build-out of the project, with the potential to add combined heat and power (CHP) to also serve some of the electric load. A centralized heating and cooling plant can provide hot and chilled water through distribution pipes to serve the full thermal and hot water loads of the entire development. This approach has been shown to significantly reduce the GHG emissions compared to individual boilers/chillers in each building or residential unit, and provides additional benefits in terms of operations and maintenance, fuel flexibility, and increased usable building space. The central thermal plant could be fueled by natural gas, biomass or geothermal. The project proponents should evaluate this energy approach for its GHG emission benefits and economic feasibility. The following websites are recommended for additional information on feasibility and life-cycle costs analyses relating to district energy systems: the International District Energy Association (IDEA), www.districtenergy.org., the USEPA Combined Heat and Power Application Center, http://www.epa.gov/chp, and RETScreen® International http://www.retscreen.net/ang/home.php. If district heating and cooling is not feasible, other options for consideration other than fuel oil or electric include extending a near-by natural gas line, and geothermal or wood pellet/biomass for individual buildings.

The proponent also conducted a greenhouse gas (GHG) emissions analysis to quantify carbon dioxide (CO2) emissions from transportation related sources for Phase A. MassDEP requests that the project proponent also conduct a GHG emissions analysis for Phase B according to the requirements the Policy. The project proponent should consult with MassDEP regarding modeling protocol prior to conducting this analysis. The current emission model, MOBILE 6.2 should be used for this effort.

The mesoscale analysis described above is used to estimate the indirect emissions from transportation CO2 emissions associated with the additional project related vehicle trips. The calculation should compare CO2 emissions for existing and future year (full) Build and No Build conditions and future year (full) Build with Mitigation conditions.

For the purpose of determining traffic impacts and site access evaluations, the project proponent must conduct an analysis of all roadway segments affected by the project, specifically the area within a 0.3 to 16 km radius of the project; the exact geographical area depends on local conditions and the impact of the project on area travel patterns.

The area should be large enough to include all roadway links that could experience a 10% potential increase in traffic and which currently operate at or, will be degraded to, a Level of Service (LOS) D or lower. The project proponent should identify the proposed boundaries of each of the project alternatives, including the Existing condition in the Base Year, and the No-Build, Build conditions in the project completion and project design years as appropriate.

VOC and NOx emissions for the Existing condition can be estimated using existing characteristics on the roadway segments. Emissions in the Build and No-Build conditions can be estimated by changing the traffic characteristics accordingly, on the roadway segments to those conditions that are expected to occur when the entire project is completed.

If the mesoscale analysis of the Build condition compared with the No-Build condition indicates that the proposed project will result in an increase in VOC and NOx emissions, which is expected given the large number of additional trips, then the project proponent must demonstrate a good faith effort to develop, implement or fund adequate mitigation measures to offset these increases to the maximum extent possible. The mitigation measures may include project appropriate Transportation Demand Management (TDM) measures and/or other project specific measures.

MassDEP implements the Rideshare Regulation (310 CMR 7.16), a clean air program that applies to employers with 250 or more daily employees. Employers subject to the Rideshare Program must implement a series of incentives that are designed to reduce the number of trips made by employees who drive alone to work. To date, employers with 1,000 or more employees and employers with 250 or more employees that are also subject to the Air Operating Permit Program (as detailed in MassDEP's regulation, 310 CMR 7.00, Appendix C) must comply with the Rideshare regulation.

The Rideshare Program requires employers to submit annual reports, determine how their employees commute to work, and provide transit passes and a carpool-matching program to employees, among other incentives. Should the facilities at the proposed project employ 250 or more employees, the project proponent should contact MassDEP at 617-292-5663 for assistance in complying with this air quality program.

The Massachusetts Idling regulation (310 CMR 7.11) prohibits motor vehicles from idling their engines more than five minutes unless the idling is necessary to service the vehicle or to operate engine-assisted power equipment (such as refrigeration units) or other associated power. The proponent should consider posting idling restriction signs on the premises to remind all drivers, patrons, and delivery personnel of the state's idling regulation. Questions regarding this regulation should be directed to Julie Ross of MassDEP at 617-292-5958.

MassDEP believes it is necessary to mitigate the construction-period impacts of diesel emissions to the maximum extent feasible and thus recommends that the project proponent participate in the MassDEP Diesel Retrofit Program. Diesel

emissions contain fine particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), which has been found to exacerbate a number of heath conditions, such as asthma and respiratory ailments. $PM_{2.5}$ also contributes to lung damage and has been identified as a likely carcinogen.

MassDEP recommends that the project proponent work with its staff to implement construction-period diesel emission mitigation, which could include the installation of after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). For more information see MassDEP's guidance document, "Diesel Engine Retrofits in the Construction Industry – A How to Guide." This document is available on MassDEP's website at http://www.mass.gov/dep/air/diesel/conretro.pdf. Additional questions or help can be directed to Gary Rennie of MassDEP at 617-292-5869.

In addition, MassDEP recommends that the project proponent use ultra low sulfur diesel (ULSD) fuel. ULSD fuel has a sulfur content of approximately 15 parts per million (ppm) in contrast to the 500 ppm sulfur level of current off-road diesel fuel recently required by the U.S. Environmental Protection Agency (EPA). The use of ULSD fuel, in conjunction with after-engine emission controls, can reduce additional amounts of $PM_{2.5}$.

MassDEP acknowledges the Traffic Demand Management ('TDM') measures the project proponent has committed to implement to reduce drive-alone trips to the project, such as sidewalks, lighting, bicycle racks, storage lockers and preferential parking. However, MassDEP requests that the project proponent provide the following additional details to further demonstrate commitment to these measures in the EIR for Phase B:

1. The number and location of bicycle racks and/or storage lockers for bicycles that will be provided;
2. The number and location of spaces that will be designated for preferential parking;

Because the project proponent will not necessarily be the occupant of the project, MassDEP also encourages the developer to demonstrate its good faith effort to reduce vehicle trips by requesting or requiring that tenants of the project sign contracts committing to implement TDM measures, including the measures listed below. The EIR should discuss in detail the implementation of these additional measures:

- **Commuter Tax Benefit Program.** This transportation tax benefit program encourages employees to take transit or vanpools to work, providing transit and bus services are available within a mile of the project site. This program provides the added benefit of decreasing taxes for employers and employees.

- **Transportation Management Association (TMA).** MassDEP recommends that the proponent join or help form a TMA that serves the project area. TMAs are organizations that help several employers in a local area develop and implement incentives that reduce traffic and trips to the worksite. Employers pay a fee for

this service to a centralized coordinator to market and implement these incentives on their behalf. To find out more about TMAs in the project area, please see: http://www.masscommute.com/tma_directory.htm.

- **Guaranteed Ride Home (GRH) Program.** MassDEP recommends that the proponent establish an emergency ride home program for all project employees who travel by carpools/vanpools. In a GRH program, the employer provides emergency rides home in the form of taxis or work vehicles to employees that carpool or vanpool to work.

- **Rideshare-Matching Program.** MassDEP recommends that the proponent establish a rideshare-matching program to match employees in carpools and/or vanpools. The project proponent could also enlist the services of a third-party provider to carry out this program.

Furthermore, MassDEP recommends that the project proponent put into place these measures to reduce drive-alone trips to the project:

- **Additional Walking Incentives.** In addition to the measures cited by the project proponent, MassDEP recommends that the proponent install benches and other amenities, such as plantings, throughout the project to promote pedestrian use of the project.

- **Bicycle Incentives.** To promote additional bicycling to the site, MassDEP recommends that the proponent also install employee shower facilities and provide other incentives (e.g., bicycle helmets, coupons to bike stores and bike locks).

- **Traffic Calming.** Traffic calming measures in excess of jurisdiction requirements reduce vehicle speed and encourage bicycle and pedestrian trips. All sidewalks within or adjacent to a project should be a minimum of 5' wide with vertical curbing and avoid acute angle intersections. Streets internal and adjacent to the project should also feature on-street parking, planter strips and street trees and variations in road width to discourage high-speed travel.

- **Shuttles.** MassDEP recommends that the proponent establish a transportation shuttle service to connect customers and employees to the various buildings on site to reduce vehicle trips within the site. MassDEP also recommends that the project proponent explore the possibility of developing a shuttle to the Old Colony Commuter Rail Stop in Plymouth to service the commuting employees at the proposed site.

Finally, MassDEP recommends that the project proponent explore ways to encourage users to use transit or carpool to the proposed project, including offering discounts to customers who come to the retail establishment in a carpool, by transit or another method.

Submittals for subsequent phases of the development should also include an analysis of the GHG impacts related to materials management. By quantifying these impacts, the applicant's GHG mitigation efforts related to materials management can be more clearly identified and targeted appropriately. MassDEP seeks quantification to help guide changes in the project, which provide a comprehensive approach to materials management throughout the design, construction, and operational phases of the project. There are a number of resources available to help quantify GHG impacts associated with efficient materials management, including the USEPA Warm Model, available at the following website: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html, and the Building Reuse Calculator at: http://www.wastematch.org/calculator/calculator.htm.

MassDEP and DOER encourage the proponent to meet with the agency representatives to discuss the issues raised above prior to their filing the EIR.

If you have any questions concerning the Greenhouse Gas Emissions comments listed above, please call Jennifer Viveiros at (508) 946-2739.

The MassDEP Southeast Regional Office appreciates the opportunity to comment on this proposed project. If you have any questions regarding any of these comments, please contact Sharon Stone at (508) 946-2846.

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CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS ON THE ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Northwest Office Park Redevelopment
PROJECT MUNICIPALITY	: Middlesex Turnpike - Burlington
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 14000
PROJECT PROPONENT	: Nordblom Company
DATE NOTICED IN MONITOR	: April 11, 2007

Pursuant to the Massachusetts Environmental Policy Act (G. L., c. 30, ss. 61-62H) and Sections 11.06 of the MEPA regulations (301 CMR 11.00), I determine that this project **requires** the preparation of an Environmental Impact Report (EIR).

Project Description

As described in the Environmental Notification Form (ENF), the proposed project consists of the redevelopment of Northwest Park into approximately 3.28 million square feet (sf) of mixed-use development to be completed in two phases. The Mixed-Use Phase or Area A includes approximately 1.28 million sf of space. It is comprised of approximately 300 residential units, 600,000 sf of retail/restaurant space, an approximately 200-room hotel, 260,000 sf of general office space, and additional open space. Area A is approximately 48 acres. The Office Phase or Area B includes approximately 2 million sf of general office space. Area B is approximately 79 acres. The existing project site contains approximately 1.34 million sf of existing office space with some commercial uses (e.g. daycare facility) with parking for 4,830 cars in surface lots. These buildings will be demolished or reconfigured to make way for the proposed project. The site is adjacent to Route 3 and close to I-95 (Route 128). It is comprised of approximately 127 acres, between Route 3 and the Middlesex Turnpike.

The project requires a mandatory EIR pursuant to Sections 11.03(1)(a)(2), 11.03(6)(a)(6) and 11.03(6)(a)(7) of the MEPA regulations because it creates 10 or more acres of impervious

area, generates 3,000 or more new vehicle trips, and includes the construction of 1,000 or more new parking spaces. It will require an Indirect Access Permit and Traffic Signal Permits from the Massachusetts Highway Department (MassHighway). The project may require a Construction Dewatering Permit, a Notice of Construction & Demolition, a Limited Air Plan Approval/Fossil Fuel Emission Permit, a Notice Regarding Demolition and Construction, a Modification Permit for the water distribution system, a Cross Connection Permit, and a Sewer Extension/Connection Permit from the Department of Environmental Protection (MassDEP). It may need to obtain a Construction Dewatering Permit from the Massachusetts Water Resources Authority (MWRA). The project may require a blasting permit from the State Fire Marshall's Office. It must comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges from a construction site. The project may require a Programmatic General Permit from the U.S. Army Corps of Engineers. An Order of Conditions will be required from the Burlington Conservation Commission for impacts to wetland resource areas and buffer zones. MEPA jurisdiction extends to land alteration, traffic, air quality, wetlands, stormwater, blasting, water, and wastewater issues that may have significant environmental impacts.

Using the unadjusted Institute of Traffic Engineers Trip Generation land use codes (220, 310, 710, and 820), the proponent has estimated that the project will generate approximately 39,348 average weekday (unadjusted) vehicle trips and approximately 36,664 Saturday trips. The proponent has estimated that the project would generate about 30,395 net new vehicle trips on a weekday and 25,890 trips on Saturday when adjustments are made for pass-by and diverted linked trips. Access to the project site from the regional highway system would be provided from Second, Third, and Fourth Avenues to the Middlesex Turnpike and to I-95 and to Route 62 and its interchange with Route 3. The proponent has estimated that the project will require 8,620 shared parking spaces in structured and surface facilities.

The proposed project will be connected to existing municipal water and sewer service. It will consume approximately 370,000 gallons per day (gpd) of water and will generate approximately 335,000 gpd of wastewater flow.

SCOPE

The EIR should also follow Section 11.07 of the MEPA regulations for outline and content, as modified by this scope. It should include a copy of this Certificate and all comment letters.

Project Description & Regulatory Environment:

The EIR should include a detailed description of the project with a summary/history of the project. It should briefly describe each state agency action required for the project. The EIR should demonstrate how the project is consistent with the applicable performance standards. It

should contain sufficient information to allow the permitting agencies to understand the environmental consequences related to the project.

The EIR should identify and explain any project phasing. It should explain the time frame for each phase of the project. The EIR should discuss how this project is compatible with Executive Order 385 – Planning for Growth, by discussing its consistency with local zoning, and the Metropolitan Area Planning Council's Metro Plan 2000.

Alternatives Analysis:

In addition to the No-Build Alternative and the Preferred Alternative (3.28 million sf), the EIR should develop an alternative that maximizes site layout and sustainable design/Low Impact Development (LID) opportunities to minimize water, wastewater, stormwater and wetland impacts. The EIR should identify the impacts of each of the alternatives, on traffic, parking, transit, pedestrian/bicycle facilities, transportation demand management, air quality, wetlands, drainage, drinking water, wastewater, construction, visual aesthetics (building renderings), blasting, and sustainable design. It should provide a comparative analysis that clearly shows the differences between the environmental impacts associated with each of the alternatives.

Traffic:

Because the project has the potential to generate an additional 30,395 daily vehicle trips in a congested area, and because these daily vehicle trips may cause traffic impacts, the EIR should develop a traffic study to address potential impacts. The traffic study should be prepared in conformance with the EOEA/EOTC Guidelines for EIR/EIS Traffic Impact Assessment. It should identify appropriate mitigation measures for areas where the project will have a direct impact on traffic operations. The EIR should describe the infrastructure improvements for each phase of the project. Proposed trip generation numbers should be explained from the Institute of Traffic Engineers' land use codes. The use of adjustments for internally captured trips, non-vehicle trips to the site (transit mode share) and pass-by and diverted linked trips should be clearly explained within the EIR. The EIR should present the credit assumptions for existing, internal captured, pass-by and diverted link and specify which land use they are applied to, and explain graphically their assignment to the roadway system. It should include adequate documentation to demonstrate the ownership, square footage, and date of vacancy of each building to be demolished. The EIR must explain how the trip generation numbers were developed in laymen's terms and should contain the necessary background data. The proponent should seek MassHighway concurrence of the credit assumptions to be taken for both existing land uses and for the shared trips among the various land uses for the proposed project.

The EIR should provide for the analysis of impacts on the level of service (LOS) at the intersections listed below:

- Middlesex Turnpike/Third Avenue;
- Middlesex Turnpike/Second Avenue/Burlington Mall Road (BMR);
- Second Avenue/South Avenue;
- South Avenue/Middlesex Turnpike/Burlington Mall Driveway;
- Middlesex Turnpike/I-95 Southbound Ramps/Route 3;
- Middlesex Turnpike/Wheeler Road East/I-95 Northbound Ramps;
- Middlesex Turnpike/Wheeler Road West;
- Middlesex Turnpike/Fourth Avenue;
- Middlesex Turnpike/Terrace Hall Avenue;
- Middlesex Turnpike/Network Drive;
- Network Drive/Route 62;
- Route 62/Crosby Drive/Route 3 Northbound Ramps;
- Route 62/Route 3 Southbound Ramps;
- Route 62/Middlesex Turnpike;
- BMR/Meadow Road;
- BMR/Lexington Street;
- BMR/New England Executive Park;
- BMR/Lahey Clinic;
- BMR/South Bedford Street/Stonybrook Road;
- BMR/Marriott Drive/Office Park; and
- BMR/Route 3A/I-95 Southbound Ramp.

The LOS analysis in the Traffic Study should include the a.m. and p.m. peak weekday peak hours, Saturday midday peak hour, volume to capacity ratios, a traffic distribution map, and background growth from other proposed developments in the area. The EIR should present the traffic generated by the other projects undergoing MEPA review in the background traffic numbers. The Mixed Use Phase (Area A) should use 2011 as a build year, and Office Phase (Area B) should use 2016 as its build year, unless MassHighway recommends a different build year. For each intersection in the study area, the EIR should include with its LOS analysis: time delay, capacity, and a summary of the average and 95th percentile vehicle queues. The EIR should include a traffic signal warrant analysis for any proposed traffic signals.

The EIR should present merge, diverge, and weaving analysis for each ramp junction at the I-95/Route 3/Middlesex Turnpike and the Route 3/Route 62 interchanges. It should include the merge/diverge analysis on the I-95 southbound approach to the Middlesex Turnpike/Route 3 exit, the weave on the I-95 southbound frontage road between the ramp from the Middlesex Turnpike to I-95 southbound and the Route 3 northbound approach, the merge/diverge on the I-

95 northbound approach to the Route 3/Middlesex Turnpike exit, the weave along I-95 northbound frontage road between Route 3 and the Middlesex Turnpike off-ramp, and the merge at the Middlesex Turnpike ramp to I-95 northbound and the I-95 northbound frontage road to I-95 northbound.

The traffic study should examine present and future build and no-build traffic volumes for all impacted roadways and intersections. A full Roadway Segment Analysis (RSA) for the Middlesex Turnpike between Route 62 and Wheeler Road West should be conducted by the proponent. The RSA should include access management along the corridor, traffic signal warrant analysis at the major driveway intersections, traffic signal coordination/interconnection, and providing sufficient capacity (two through travel lanes in either direction with left/right turning lanes) along the Middlesex Turnpike. Is there sufficient capacity in this area to handle the proposed traffic from the project? The proponent should continue work with MassHighway and the Town of Burlington to develop sufficient traffic mitigation measures.

The EIR should describe how the project intends to accommodate service and loading functions and the requirements of the project for service/loading infrastructure (e.g., projected demand, circulation, required turning radii, etc.). It should analyze the impacts of service and loading functions on the area traffic network.

Any plans for the major reconstruction of the roadways in the study area should be discussed in the EIR. The EIR should identify the proponent's coordination efforts with MassHighway, and the Towns of Burlington and Bedford.

Parking:

Parking at the site will include a total of approximately 8,620 spaces in parking garages and surface lots. The EIR should provide a breakdown of parking needs by land use category/use, time of day, and employee/customer/resident/visitor category to demonstrate the need for the proposed 8,620 spaces. It should identify Burlington's parking supply recommendations (zoning requirements). Any valet parking operations for the proposed project should be described in the EIR. Valet routes to the parking garages should be identified in the EIR. The parking needs assessment should take into account the turnover rates for employees, customers, residents, valet parkers, and visitors, and parking fees. The EIR should describe how the number of parking spaces needed was determined. Parking demand management should be a key component of the overall mitigation analysis. The EIR should identify the proposed parking fees for the various project uses. The EIR should identify taxi-parking areas along curbs and reserved parking for Zip Car or a similar service within the parking garages.

Transit:

The EIR should identify the local bus routes and their scheduled hours. Transit services are operated by the MBTA, the Town of Burlington (B-Line), and the Lowell Regional Transit Authority. If the proponent creates demand for bus services with its project and there are capacity constraints on the services, the EIR should propose mitigation. The proponent should consider providing monthly transit pass subsidies to all employees at the site to encourage transit use. The EIR should identify private shuttle bus routes in the area operating to the Anderson Transportation Center or other transit centers.

Pedestrian and Bicycle Facilities:

The EIR should show existing and proposed pedestrian facilities in the study area. It should show where traffic calming measures are proposed. The proponent should provide pedestrian connections and signage to the Burlington Mall.

The EIR should identify the proposed bicycle facility improvements included with this project. It should show where temporary and longer visit bicycle parking would occur on the project site. The EIR should show the number of bicycle parking spaces and their location on the project site.

Transportation Demand Management:

The EIR should present a comprehensive Transportation Demand Management (TDM) Program designed to minimize reliance on single passenger vehicle trips for employees at Northwest Park. The TDM measures that the proponent develops may be the most significant items to reduce single passenger vehicle trips.

Air Quality:

The EIR should provide a mesoscale air quality analysis. A mesoscale air quality analysis for ozone will be needed for this project to assess the total ozone precursor (volatile organic compounds and nitrogen oxides) emissions associated with all project-related vehicle trips and to demonstrate that the ozone precursor emissions associated with the preferred alternative are less than those from the no-build case, in the short- and long-term. If ozone precursor emissions from the preferred alternative are greater than the no-build case, reasonable and feasible ozone precursor reduction/mitigation measures must be included. The proponent should consult the "Guidelines for Performing Mesoscale Analysis of Indirect Sources" and MassDEP's Division of Air Quality Control to determine the appropriate study area.

In its comment letter, the Metropolitan Area Planning Council (MAPC) stated that residences and playgrounds should not be located within 1,000 feet of high volume roads, like Route 3. The EIR should demonstrate that no residences or playgrounds are proposed within this area of Route 3. If any such uses are proposed in this area, alternative designs should be presented in the EIR. In addition, the proponent should commit to screening and filtering methods that will keep harmful pollutants away from the new residents at this site. While the project was filed with MEPA prior to the adoption of the EOEEA Greenhouse Gas (GHG) Emissions Policy, I encourage the proponent to voluntarily quantify GHG emissions generated by the proposed project and identify measures to avoid, minimize, or mitigate GHG emissions.

Wetlands:

The Wetland Section of the EIR should contain an alternatives analysis to ensure that all wetland impacts are avoided, and where unavoidable impacts occur, impacts are minimized and mitigated. The EIR should illustrate that the impacts have been minimized and that the project will be accomplished in a manner that is consistent with the Performance Standards of the Wetlands Regulations (310 CMR 10.00).

The EIR should address the significance of the wetland resources on site, including public and private water supply; riverfront areas; flood control; storm damage prevention; fisheries; shellfish; and wildlife habitat. It should identify the location of nearby public water supplies and wells.

All resource area boundaries, riverfront areas, applicable buffer zones, and 100-year flood elevations should be clearly delineated on a plan. Bordering vegetated wetlands that have been delineated in the field should be surveyed, mapped, and located on the plans. Each wetland resource area and riverfront area should be characterized according to 310 CMR 10.00. The text should explain whether the local conservation commission has accepted the resource area boundaries, and any disputed boundary should be identified. The EIR should provide an accurate measurement of the wetland resource areas that will be affected by the project.

For any amount of required wetlands replication, a detailed wetlands replication plan should be provided in the EIR that, at a minimum, includes: replication location(s) delineated on plans, elevations, typical cross sections, test pits or soil boring logs, groundwater elevations, the hydrology of areas to be altered and replicated, list of wetlands plant species of areas to be altered and the proposed wetland replication species, planned construction sequence, and a discussion of the required performance standards and monitoring. MassDEP is recommending a replication rate greater than 1:1.

Drainage:

The EIR should present drainage calculations and detailed plans for the management of stormwater from the proposed project. It should include a detailed description of the proposed drainage system design, including a discussion of the alternatives considered along with their impacts. The EIR should identify the quantity and quality of flows. It should describe the rates of stormwater runoff for the 2, 10, 25 and 100-year storm events. If the proponent ties into the existing municipal stormwater system or the MassHighway system, the EIR should clarify the permits required and if there will be a recharge deficit on-site.

The EIR should address the performance standards of MassDEP's Stormwater Management Policy. It should address the groundwater recharge issues and demonstrate that the project will meet the Stormwater Management Policy. The EIR should demonstrate that the design of the drainage system is consistent with this policy, or in the alternative, why the proponent is proposing a drainage system design not recommended by MassDEP. The proponent should use the MassDEP Stormwater Management Handbook when addressing this issue.

The EIR should discuss consistency of the project with the provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit from the U.S. Environmental Protection Agency for stormwater discharges from construction sites. It should include a discussion of best management practices employed to meet the NPDES requirements, and it should include a draft Pollution Prevention Plan. According to MassDEP's comment letter, any discrepancies between the stormwater management plan for this project and the Town of Burlington's stormwater program needs to be resolved before proceeding with this project. Because approximately 78 percent of the site may contain impervious surfaces, the EIR should consider Low Impact Development (LID) measures that minimize the volume of stormwater runoff to be treated and controlled by maintaining the existing hydrologic functions. The EIR should consider LID tools to reduce the amount of impervious areas.

In addition, a maintenance program for the drainage system will be needed to ensure its effectiveness. This maintenance program should outline the actual maintenance operations, sweeping schedule, responsible parties, and back-up systems. I recommend that the proponent commit to use a non-sodium based deicer on pavement surfaces.

Any dewatering of the construction site should include monitoring to ensure that there is no impact to the groundwater level. The EIR should outline the monitoring program of groundwater levels. It should summarize existing pre-construction groundwater conditions, and propose groundwater monitoring to address any proposed impacts.

Drinking Water:

The EIR should explain any impacts from the project on the drinking water supply and distribution system. It should propose mitigation as appropriate. If alternative water supply sources are being considered; they should be fully evaluated in the EIR. The project site is within the wellhead protection area (Zones II and III) for Burlington's public water supply wells. The EIR should explain the subsurface conditions where stormwater infiltration is proposed in the wellhead protection area to demonstrate that the project impacts are within regulatory compliance. It should evaluate the potential for irrigation wells in both Areas A and B.

Wastewater:

The EIR should outline the proponent's efforts to reduce water consumption and thereby reduce wastewater generation. In addition, the proponent should consider implementing other Low Impact Design (LID) features, as discussed below. The proponent should meet with the Town of Burlington and MassDEP to discuss approaches to meet the requirements of the Burlington sewer bank and the MassDEP Administrative Consent Order. It should provide supporting information for the exclusion of 110,000 gallons of its existing wastewater flow. According to MassDEP, the proponent would need to eliminate 1.3 million gallons of Infiltration/Inflow (I/I). The proponent should consider the installation of High Efficiency Toilets throughout the project to reduce water demand. The EIR should identify any capacity deficiencies within the municipal wastewater system to handle the project's additional wastewater flows. The EIR must address this I/I issue and work closely with the Massachusetts Water Resources Authority (MWRA), MassDEP, and the Town of Burlington. The MWRA reported that the discharge of groundwater to the sanitary sewer system with the project is prohibited.

Construction/Community Disruption:

The EIR should present a discussion on potential construction period impacts (including but not limited to noise, vibration, dust, and traffic maintenance) and analyze feasible measures, which can avoid or eliminate these impacts. It should outline how this proponent will coordinate its construction program with other nearby projects and maintain access to all abutters. The EIR should estimate the amount of fill to be removed or brought to the site. It should identify the number of truck trips required to handle the filling operation and the truck routes for fill removal. The EIR should describe any blasting proposed at the project site. It should describe the proponent's plans to deal with blasting and the notification process to adjacent land owners and local officials.

Visual/Aesthetics:

The EIR should include an analysis of the visual impacts of the proposed project, including renderings of the proposed buildings. A landscaping plan should be provided in the EIR. The proponent should incorporate native plants and low water using landscape materials in this plan.

Hazardous Waste:

The EIR should present a summary of the results of hazardous waste studies and remediation efforts undertaken at the project site by the proponent and others to comply with the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000. It should identify how construction activities will be coordinated with the ongoing remedial activities at MCP sites at the project site. The EIR should address MassDEP's concerns regarding hazardous waste issues.

Sustainable Design/Low Impact Design (LID):

To the maximum feasible extent, the proponent should incorporate sustainable design elements into the project design. The EIR should summarize the proponents' efforts to ensure that this project includes Leadership in Energy and Environmental Design (LEED) Certified buildings or the equivalent. The basic elements of a sustainable design program may include, but not be limited to, the following measures:

- optimization of natural day lighting, passive solar gain, and natural cooling;
- use of energy efficient HVAC and lighting systems, appliances and other equipment, and use of solar preheating of makeup air;
- favoring building supplies and materials that are non-toxic, made from recycled materials, and made with low embodied energy;
- provision of easily accessible and user-friendly recycling system infrastructure into building design;
- development of a solid waste reduction plan;
- development of an annual audit program for energy consumption, waste streams, and use of renewable resources;
- LID principles that reduce stormwater, potable water, wastewater, and wetland impacts and that provide water conservation and the reuse of wastewater and stormwater; and
- LEED certification.

Mitigation:

The EIR should include a separate chapter on mitigation measures. It should develop

transportation and parking demand management measures to reduce single passenger automobile trips to the project and encourage ridesharing to the site through the use of preferential parking. I encourage the proponent to identify measures to increase transit usage to the project site. This chapter on mitigation should include a Draft Section 61 Finding for all state permits. The Draft Section 61 Finding should contain a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation, and the identification of the parties responsible for implementing the mitigation. A schedule for the implementation of mitigation should also be included.

In the Town of Burlington planning process and in the ENF, the proponent has committed to the following mitigation measures:

- Provide a minimum increase of 10 percent above the existing infiltration volume into the surrounding aquifer.
- Provide a 5:1 ratio of I/I removal for project added wastewater flows to the municipal system.
- Fund a Transportation Master Plan for the area to identify and address long-term transportation improvements.
- Designate 10 percent of the housing units as affordable units to comply with the Commonwealth's affordable housing policies.
- Provide a new public open space and a bicycle/pedestrian trail through the project site.
- Install a fully-actuated traffic signal at the Middlesex Turnpike/Third Avenue intersection, make geometric improvements, and coordinate the new signal with the next three signals along the Turnpike to the north .
- Modify traffic signal phasing and timings at the Middlesex Turnpike/Second Avenue intersection and make geometric improvements.
- Install a fully-actuated traffic signal at the South Avenue/Second Avenue intersection, coordinate the new signal with the signal at Middlesex Turnpike/Second Avenue, and make geometric improvements at the intersection.
- Design signal timing modifications at Middlesex Turnpike/Fourth Avenue.
- Provide signal phasing and lane reconfigurations at Route 62/Network Drive.
- Modify the signal phasing and timings and the lane configurations at the Middlesex Turnpike/I-95 Northbound Ramps/Wheeler Road intersection.
- Modify the signal timing at the BMR/Marriott Driveway.
- Provide street sweeping within the project site.
- Provide a TDM program with an on-site coordinator and commuter information.
- Supply bicycle parking accommodations throughout the project.
- Provide spaces for a car-sharing service, such as Zipcar.
- Coordinate the traffic signals along the Middlesex Turnpike from the Middlesex Commons Mall entrance to the Network Drive intersection.

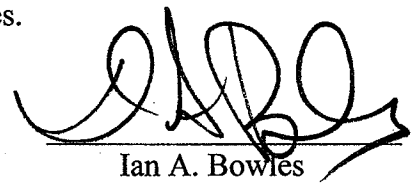
I urge the proponent to participate in any discussions and studies, which evaluate the feasibility of traffic, transit, pedestrian and bicycle improvements within this area.

Comments:

The EIR should respond to the comments received to the extent that the comments are within the subject matter of this scope. Each comment letter should be reprinted in the EIR. I defer to the proponent as it develops the format for this section, but the Response to Comments section should provide clear answers to questions raised.

Circulation:

The EIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should also be sent to the list of "comments received" below and to local officials in Burlington and Bedford. A copy of the EIR should be made available for public review at the Burlington and Bedford Public Libraries. The proponent should provide a hard copy of the EIR to each state agency from which the proponent will seek permits or approvals and to Burlington's commenting agencies.



May 11, 2007
DATE

Ian A. Bowles

Comments received:

VHB, 4/12/07
MWRA, 4/30/07
MassDEP/NERO, 5/1/07
MAPC, 5/3/07
EOT, 5/3/07
Anne Rowe, 5/6/07
VHB, 5/10/07
Anne Rowe, 5/10/07

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IAB/WTG/wtg

BA

Metropolitan Area Planning Council

60 Temple Place, Boston, Massachusetts 02111 617-451-2770 fax 617-482-7185 www.mapc.org

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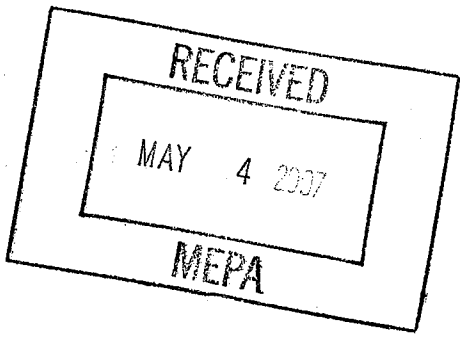


May 3, 2007

Ian Bowles, Secretary
Executive Office of Environmental Affairs
Attention: MEPA Office
William Gage, MEPA # 14000
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: Northwest Park Redevelopment, Burlington, EOEA # 14000 ENF

Dear Secretary Bowles:

The Metropolitan Area Planning Council (MAPC) regularly reviews proposals deemed to have regional impacts. The Council reviews projects for consistency with *MetroPlan*, the regional policy plan for the Boston metropolitan area, and MAPC's Smart Growth Principles, as well as for their impacts upon the environment. MAPC has reviewed the Expanded Environmental Notification Form (EENF) and offers the following comments.

The site has access off Middlesex Turnpike and Second Avenue and its 127 acres are currently developed as 1.34 million square feet of office space with a few commercial uses. The redevelopment plan proposes replacing these uses with 1.9 million square feet of new office, plus 1.3 million square feet of mixed use development including up to 300 new residential units, in two phases. New internal local streets will be created as part of the circulation plan and there are proposed to be 8700 parking spaces (surface and structured) at buildout (a net increase of 3870 new spaces). The redevelopment will result in 28 acres of new open space.

When fully developed, this project will be consistent with many of MAPC's Smart Growth Principles. It redevelops an already developed area, creates new open space, and provides a mixture of uses including jobs and housing. With regard to the 300 units of housing, the EIR should indicate how many of the housing units will be ownership and how many rental; how many of the units will be affordable; the income groups for which these units will be affordable, based on maximum eligible percentage of areawide median income; and the bedroom breakdown of the units. Furthermore, the proponent should commit that the affordable units will not be disadvantaged in term of design, ownership status, or bedroom breakdown when compared to the market-rate units.

The Planned Development District zoning was recently approved at the Burlington Town Meeting. However, most access to the site will of necessity be via private auto, and water use, wastewater, and stormwater runoff will present challenges. We believe that the EIR should therefore focus on transportation and water issues.

Transportation

The EIR should include the standard traffic analysis of nearby roadways, including in this case impacts on the reconstructed Middlesex Turnpike out to the Bedford/Billerica border. This portion of Middlesex Turnpike is scheduled to begin reconstruction, including an additional lane in each direction beginning in FY2008. The proponent should demonstrate that most of this additional roadway capacity will not be taken up by new traffic generated by this development. Given the current and likely future problems at the confluence of Route 128, Route 3, and Middlesex Turnpike, this area should also be part of the traffic analysis and mitigation alternatives there should be explored.

We believe Transportation Demand Management (TDM) options should be a prominent part of the mitigation package for the project. With over 3 million square feet of mixed use development at this site, plus the nearby location of the Burlington Mall, Leahy Clinic, and many other large office and retail destinations, this area provides many opportunities for carpooling and vanpooling, for transit services within the area and connections to other destinations, and for walking and bicycling between them all. Opportunities for shared parking on the site and with the surrounding developments should be explored, and safe, convenient pedestrian access across Middlesex Turnpike and Second Avenue should be provided. The EIR should fully explore all opportunities to reduce the number of single occupant vehicle trips to and from the site, and the mitigation package proposed should focus first on minimizing vehicle trips before proposing roadway improvements only as a last resort.

A final area to explore in the EIR is the health impacts that come from proximity to high emission transportation corridors. Residences and playgrounds should not be located within 1000 feet of high volume roads, Route 3 in particular. In the EIR, the proponent should demonstrate that no residences or active playgrounds in the current proposal are within this distance of Route 3, or should provide an alternative design that keeps residences or parks at a safe distance. Alternately, the proponent should commit to screening and filtering methods that will keep harmful pollutants away from the new residents at this site.

Water Resources

This redevelopment project offers an excellent opportunity to implement state-of-the-art sustainable water resources management measures that can mitigate the project's impacts and in some cases provide improvements over existing conditions. The DEIR should include the following measures:

- Incorporate **Low Impact Development** measures into the site design to the maximum extent possible in order to reduce the volume of stormwater runoff and loads, and increase recharge to the aquifer. Such measures may include bioretention cells, rain gardens, grassed swales, filter strips, green roofs, and rooftop runoff recharge. MAPC has published a Low Imapct Development Tool Kit, available online at www.mapc.org/lid.

- Consider the installation of **High Efficiency Toilets** (HET's) to reduce the demand on the town of Burlington's water system as well as the volume of wastewater generated. HET's use about 25 percent less water than the standard low-flow toilets that are required by the plumbing code (1.2 gallons per flush vs. 1.6 gpf for standard low flow toilets). HETs have been available in the marketplace since 1999, and today 18 toilet manufacturers are marketing over 95 such models. More information on HET's is available from the California Urban Water Conservation Council at www.cuwcc.org/toilet_fixtures.lasso#HETs.

- Incorporate **native plants and low water using landscape materials** in order to minimize water used for landscape irrigation and reduce the stress of peak summer water demands on the water system as well as the aquifer.

Thank you for the opportunity to comment on this project.

Sincerely,

Marc D. Draisen
Executive Director

cc: Tony Fields, MAPC Representative, Burlington

MASSACHUSETTS WATER RESOURCES AUTHORITY

Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

BG

May 1, 2007

Mr. Ian A. Bowles, Secretary
Executive Office of Energy and Environment Affairs
100 Cambridge St, Suite 900
Boston, MA 02114

RECEIVED
MAY 3 - 2007
MEPA

Attn.: MEPA Office: William Gage

Subject: EOEA #14000 - Environmental Notification Form
Northwest Park Redevelopment, Burlington

Dear Secretary Bowles:

Thank you for the opportunity to comment on the Environmental Notification Form (ENF) for the Northwest Park Redevelopment project in Burlington. The Proponent, Nordblom Company (the "Proponent") proposes to redevelop approximately 127 acres of land at Northwest Park in Burlington, MA, with a multi-phased redevelopment including an approximately 1.3 million square feet (SF) mixed-use development consisting of retail and office uses and multi-family housing ("Area A"), as well as the potential of approximately 1.9 million SF of new and reconfigured office space ("Area B"). The project site is generally bounded by Middlesex Turnpike, Second Avenue, Route 3 and Kendall Road/Sun Microsystems Campus and currently has 1.34 million SF of office space with some commercial uses in an office park setting.

According to the ENF, the plan for Area A redevelopment includes 600,000 SF of retail and restaurants, 260,000 SF of office space, up to 300 residential units, a 200-room hotel and new open spaces. Area B development could include up to a maximum of 1.9 million SF of new and/or reconfigured office/commercial space. The project represents a net change of approximately 800,000 SF of additional office space and will also entail removal and reconfiguration of the existing surface parking lots, demolition of several existing commercial/industrial buildings and other related improvements, enhanced stormwater management facilities and utility upgrades.

Wastewater from the site is collected by the Town of Burlington sewer system. Burlington wastewater flows are conveyed through the City of Woburn's sewer system to a connection with the MWRA interceptor system (Cummingsville Branch Sewer System) at the Woburn/Winchester boundary. Flows from these communities and other MWRA member communities north of Boston are conveyed through the North Metropolitan Sewer and North Metropolitan Relief Sewer to MWRA's Chelsea Creek Headworks facility, which directs flows to the Deer Island treatment plant.

The ENF reports that the project will increase wastewater (sanitary) flows to the Burlington and MWRA systems from 100,000 gallons per day existing to 335,000 gpd, or an increase of 235,000 gpd (0.235 million gallons/day (mgd)), which will require a Sewer Connection Permit from DEP with Town of Burlington and MWRA approval. The ENF also reports that the Burlington sewer system has adequate capacity to carry the project flows. While this may be true for the Burlington, Woburn and MWRA systems during dry weather, these systems are subject to much higher flows during wet weather due infiltration (groundwater) and inflow (stormwater) ("I/I") that can enter these systems. In large storms, the capacities of MWRA's system can be exceeded, resulting in sanitary sewer overflows ("SSOs") to local streams, surface flooding and/or backups into basements.

In 2006, MWRA completed a $7.5 million project to replace older sections of the Cummingsville Branch Sewer System and upgrade the system's capacity to handle peak flow demands. The upgraded capacity was based on estimated sanitary and I/I flows from the tributary service areas, including subareas of the City of Woburn and the Town of Burlington. MWRA is concerned that flows exceeding the basis for design, which was approved by the Massachusetts Department of Environmental Protection ("DEP"), could compromise the performance of MWRA's Cummingsville system in providing adequate wastewater service to these areas and environmental protection.

To ensure that increases in wastewater flow do not worsen system surcharging and SSOs, the Town of Burlington has been under a consent order from DEP that in part requires that new flows be offset with I/I reduction. According to the ENF, the Town of Burlington requires that new wastewater flows be offset at the ratio of 5 gallons of I/I removed for every gallon of new sanitary flow. The Proponent proposes to meet this requirement by contributing funds to the Town of Burlington's I/I removal program at a rate of $1.50 per gallon of I/I that is required to be removed. MWRA strongly supports the effective removal of I/I to offset the project's increase in wastewater flow and avoid increasing the burdens on the local and MWRA sewer systems. Verification of adequate offset by Proponent, subject to confirmation by the Town and DEP, is warranted.

In addition, MWRA prohibits the discharge of groundwater to the sanitary sewer system, pursuant to 360 CMR 10.023(1) except in a combined sewer area when permitted by the Authority and the municipality. Burlington is not located in a combined sewer area; therefore, the discharge of groundwater to the sanitary sewer system associated with project is prohibited.

Lastly, the Project and any of its phases must comply with 360 CMR 10.016, if they include the installation of gas/oil separators in parking garages. In addition to complying with 360 CMR 10.000, the Proponent shall conform to the regulations of the Board of State Examiners of Plumbers and Gas Fitters, 248 CMR 2.00 (State Plumbing Code), and all other applicable laws. The installation of the proposed gas/oil separators will require MWRA approval and may not be backfilled until inspected and approved by the MWRA and the Local Plumbing Inspector. To obtain an inspection, the Proponent shall contact Paul Pisano, MWRA, Source Coordinator, (617) 305-5661.

Should you have any questions or require further information on these comments, you may contact Michael David Kubiak, Sr. Program Manager, Wastewater Engineering, at (617) 570-5460, or me at (617) 788-1165.

Very truly yours,

Marianne Connolly

Marianne Connolly
Program Manager, Regulatory Compliance

cc: David Kubiak, MWRA
Kevin McKenna, MWRA
Kevin Brander, DEP
C:MEPA:14000NorthwestParkBurlington

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION

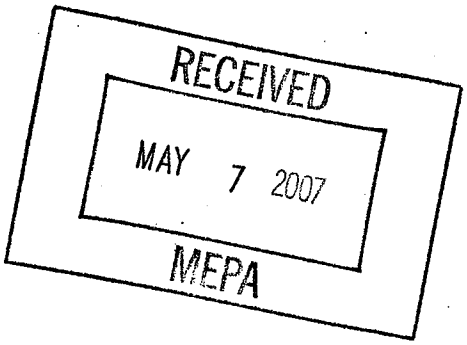
EOT

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

BERNARD COHEN
SECRETARY

May 3, 2007



Ian A. Bowles, Secretary
Executive Office of Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RE: Burlington – Northwest Park Redevelopment - ENF
(EOEA #14000)

ATTN: MEPA Unit
William Gage

Dear Secretary Bowles:

On behalf of the Executive Office of Transportation, I am submitting comments regarding the proposed Northwest Park redevelopment project in Burlington, as prepared by the Office of Transportation Planning. If you have any questions regarding these comments, please call J. Lionel Lucien, P.E., Manager of the Public/Private Development Unit, at (617) 973-7341.

Sincerely,

David J. Mohler,
Acting Deputy Secretary for Planning

DJM/jll

cc: Luisa Paiewonsky, Commissioner
David Anderson, P.E., Acting Chief Engineer
Patricia Leavenworth, P.E., District 4 Highway Director
Neil Boudreau, State Traffic Engineer
PPDU files
MPO Activities files
Planning Board, Town of Burlington
Metropolitan Area Planning Council
Boston Region Metropolitan Planning Organization

BG

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION
OFFICE OF TRANSPORTATION PLANNING

MEMORANDUM

TO: David J. Mohler, Acting Deputy Secretary for Planning
Executive Office of Transportation and Public Works

FROM: J. Lionel Lucien, P.E., Manager
Public/Private Development Unit

DATE: May 3, 2007

RE: Burlington – Northwest Park Redevelopment – ENF
(EOEA #14000)

The Public/Private Development Unit (PPDU) has reviewed the Environmental Notification Form (ENF) for the Northwest Park Redevelopment mixed-use project in Burlington. The proposed project entails the redevelopment of the existing Northwest Park office complex into a 3.28 million square foot mixed-use development that will consist of retail, office and multi-family housing components. When completed, the project will result in an increase of 1.94 million square feet of building space. The 127-acre site is located along Middlesex Turnpike, north of the I-95/Route 3/Middlesex Turnpike interchange in Burlington. Based on information provided in the ENF, the project is expected to generate approximately 20,165 additional vehicle trips on an average weekday, for a total of 30,395, vehicle trips and will provide approximately 8,620 parking spaces.
The project categorically requires the preparation of an Environmental Impact Report (EIR), and a MassHighway permit is required for indirect access to Route 3.

The Draft EIR (DEIR) should include a traffic study prepared in conformance with EOEA/EOT Guidelines for EIR/EIS Traffic Impact Assessments. The proponent should provide a clear commitment to implement mitigation measures and should describe the timing of their implementation based on the phases of the project, if any. The DEIR should present capacity analyses and a summary of average and 95th percentile vehicle queues for each intersection within the study area. Any proposed traffic signal along Middlesex Turnpike must include a traffic signal warrant analysis according to the Manual of Uniform Traffic Control Devices (MUTCD) standards. At a minimum, the traffic study should analyze the following state highway and local roadway locations:

- the Route 62/Route 3 interchange,
- the Middlesex Turnpike/I-95/Roue 3 interchange,
- the Route 3A/Mall Road/I-95 interchange,
- the Route 62/Network Drive intersection,
- the Route 62/Middlesex Turnpike intersection.

In addition, the DEIR should present a merge, diverge, and weaving analysis for each ramp junction at the I-95/Route 3/Middlesex Turnpike interchange and the Route 3/Route 62 interchange including: the merge/diverge on the I-95 southbound approach to the Middlesex Turnpike/Route 3 exit; the weave on the I-95 southbound frontage road between the ramp from Middlesex Turnpike to I-95 southbound and the Route 3 northbound approach; the merge/diverge on the I-95 northbound approach to the Route 3/Middlesex Turnpike exit; the weave along the I-95 northbound frontage road between Route 3 and the Middlesex Turnpike off-ramp; and the merge at the Middlesex Turnpike ramp to I-95 northbound, and I-95 northbound frontage road to I-95 northbound.

Prior to the submission of the DEIR, the project proponent should seek from EOT and MassHighway concurrence of the credit assumptions to be taken for both the existing land use and for the shared trips among the various land uses for the proposed project. The DEIR should present all the credit assumptions for existing, internal captured, pass-by and diverted link, specify which land use they applied to, and explain graphically their assignment to the roadway system. A vehicle trip credit is only relevant for on-site vacancy of three years or less per MEPA regulations. The DEIR should include adequate documentation to demonstrate the ownership, square footage, and date of vacancy of each building to be demolished.

The DEIR should include conceptual plans for the proposed roadway improvements that are of sufficient detail, preferably 80-scale, to verify the feasibility of constructing such improvements. The conceptual plans should clearly show proposed lane widths and offsets, layout lines and jurisdictions, and land uses (including access drives) adjacent to areas where improvements are proposed. Any proposed mitigation within the state highway layout must conform to MassHighway standards, including but not limited to, provisions for lane, median and shoulder widths, and bicycle lanes and sidewalks.

The DEIR should include a comprehensive Transportation Demand Management (TDM) program that investigates all feasible measures aimed at reducing site trip generation. The TDM program should include specific measures that have been successful in reducing trip generation for retail and office establishments. The TDM program should also identify the existing modes along the corridor such as transit, walking, and bicycling; analyze their existing and future conditions based on the project's impacts; and provide improvements to attract mode usage. The project proponent should work with the Massachusetts Bay Transportation Authority (MBTA), and the Lowell Regional Transit Authority (LRTA) regarding the potential for transit service to the site. In addition, the project proponent should discuss potential shuttle service with the Route 128 Business Council. The site plan should also accommodate transit and provide amenities to encourage transit usage, such as bus shelters and bus turnouts, as well as provide a pedestrian connection to existing land uses within close proximity to the project site.

The DEIR should provide an update of the local permitting processes for the proposed project, particularly with respect to any state highway issues being discussed. We strongly encourage the proponent to consult with MassHighway before any state highway issues are discussed in local meetings or hearings. The proponent should meet with the Public/Private Development Unit and the MassHighway District 4 Office during the preparation of the DEIR. If you have any questions regarding these comments, please contact Erin Kinahan at (617) 973-8059.

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
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DEVAL L. PATRICK
Governor

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Lieutenant Governor

IAN A. BOWLES
Secretary

ARLEEN O'DONNELL
Commissioner

May 1, 2007

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Burlington
Northwest Park Redevelopment
Middlesex Turnpike
EOEEA # 14000

Attn: MEPA Unit

Dear Secretary Bowles:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the Environmental Notification Form (ENF) submitted by the Nordblom Company to demolish several existing industrial/ commercial buildings in order to construct a 3,280,000 square foot mixed use project comprised of about 1.3 million square feet of housing, retail, and office space in Area A, and 1.9 million square feet of new and redeveloped office space in Area B on a 127 acre site in Burlington (EOEEA #14000). The development plan includes about 300 units of housing, 600,000 square feet of retail with restaurant space, 1,900,000 square feet of office/commercial, a 200 room hotel, other uses (e.g., child/adult day care, medical facilities, theatre, health club, community center), 8,700 parking spaces, and infrastructure. The Department provides the following comments on this project, which is categorically included for the preparation of an environmental impact report.

Section 61 Finding

The Department requests that the Draft EIR include a Section 61 Finding that describes and lists those measures to avoid, minimize, and mitigate environmental impacts from the project that relate to the MassDEP permits. The Finding also should identify the parties responsible for implementing these measures, and an approximate schedule for completing the work after the environment is impacted.

Wetlands

According to the ENF the proposed project would alter less than 5,000 square feet of bordering vegetated wetlands and 420,000 square feet of floodplain. Although the ENF indicates

that Wetland 1 along the perimeter of the site and adjacent to Second Avenue and Middlesex Turnpike would not be altered by the project, at the MEPA scoping session on April 24, 2007, discussions indicated that alteration to an intermittent stream is under consideration to accommodate roadway improvements on Second Avenue. Alteration to the bank would require replication in accordance with the Massachusetts Wetland Regulations. In addition, the volume of flood storage has not been quantified, nor does the ENF provide information on the compensatory flood storage to be provided. This should be addressed in their next filing.

The Department requests a description of the wetland resources on site and quantification of the extent of unavoidable wetland alteration. Plans at a readable scale should show the resource area impacts. The proponent also should explain how the project would comply with the performance standards in the wetlands regulations and demonstrate that alteration of resource areas has been avoided and minimized. Where opportunities exist, consideration should be given to project alternatives and site design changes that avoid wetlands impacts to demonstrate that the project conforms to the wetlands regulations. The Department also requests plans depicting and quantifying wetlands replication areas and information on how altered wetland functions will be restored.

Stormwater

The wetland resources on site must be protected from adverse water quality, flooding, and erosion impacts caused by stormwater runoff during construction and post-construction, under the provisions in the MassDEP Stormwater Management Policy (SMP). The EIR should demonstrate that source controls, pollution prevention measures, erosion and sediment controls during construction, and the post-development drainage system will be designed to comply with the SMP and standards for water quality and quantity impacts and for consistency with the town of Burlington's Storm Water Program. Calculations of water quality volume for this site should take into consideration areas that are within the Zone II of public water supplies, which would be considered critical areas under the SMP. The areas where infiltration of stormwater is proposed should be considered thoroughly to ensure that runoff does not mobilize any residual contamination in the soil and groundwater. The EIR also should estimate the infiltration volume that is required and provide, the total suspended solids removal of the stormwater management system, and the peak rates of runoff for predevelopment and post-development. Stormwater system design plans at a readable scale, best management practice (BMP) designs, and supporting information to demonstrate that the stormwater system design provides adequate protection for wetland resources in conformance with the SMP and the town's NPDES Storm Water General Permit also should be available in the EIR. Additional information on the SMP is available on the following MassDEP website: http://www.mass.gov/dep/water/laws/policies.htm - storm.

The town of Burlington also is required to comply with the NPDES Phase II Storm Water permit requirements, and is implementing a storm water management program that may restrict or regulate stormwater runoff from the construction work and the development proposed. In particular the requirements in the *NPDES General Permit for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems* for drinking water supplies (Part II C., regarding stormwater pretreatment and spill control), for stressed basins (Part II B. 8 regarding requirements to minimize the loss of annual recharge). Any discrepancies between the

stormwater management plan for this project and the town's stormwater program needs to be resolved before proceeding with the project.

Low Impact Development

Currently, 79 acres of the site are impervious; at full build, about 98 acres or about 78 percent of the site will be rendered impervious with pavement and buildings. The Department requests that the proponent consider alternatives to reduce the increase in imperviousness to a minimum on this site, which is within the aquifer protection area for the town's public water supply wells. Eliminating imperviousness is a fundamental low impact development (LID) measure that minimizes the volume of runoff to be treated and controlled by maintaining and mimicking existing hydrologic functions. Other LID site design techniques, such as disconnecting runoff flow pathways, dispersing stormwater control across the site, minimizing clearing and grading, and preserving natural resources and drainage patterns also should be incorporated into the stormwater management system where feasible. When combined with pollution prevention measures, LID can be less costly than conventional gutter and pipe drainage system and can provide redundancy for stormwater control.

Water Supply

The project site is within the wellhead protection area, (Zone II and Zone III), for the town of Burlington's public water supply wells. As MEPA and the town of Burlington area aware, these areas are protected by state regulations and policies and municipal bylaws. Issues relating to the public water supplies are covered under MassDEP's comments on stormwater and the Massachusetts Contingency Plan. The Zone II area would be subject to the stormwater infiltration requirements in the town of Burlington's Zoning Bylaws, Article VIII, 8.3.8.4.

The MassDEP appreciates that the proponent is planning to design a stormwater management system to maintain groundwater recharge, and at the same time, protect the water supply from contamination, associated with stormwater runoff and historic site contamination. The EIR should explain the subsurface conditions where stormwater infiltration is proposed in sufficient detail to demonstrate the project related impacts would be avoided, minimized, and mitigated, in conjunction with regulatory compliance.

Wastewater

The town of Burlington is under a MassDEP Administrative Consent Order (ACO), which requires a 4:1 removal for each new gallon to be connected, which will be applicable to the proposed project. The town of Burlington increases the I/I removal by a gallon, for a total requirement for I/I removal of 5:1. Given the amount of flow "credit" currently available in the Burlington sewer bank, it may be challenging to identify and remove the requisite infiltration and inflow (I/I) to allow a wastewater connection of this entire project. The proponent has consulted the town and developed a plan to address this issue. The Department also recommends that the proponent arrange to meet with the town and MassDEP to discuss approaches to meet the requirements of the Burlington sewer bank and the MassDEP ACO. Additional sewer flows from the project area, absent proper mitigation, would exacerbate sanitary sewer overflows from the Horn Pond Interceptor, where overflow events continue to occur, most recently in April of this year.

According to the ENF, the project would generate an additional 260,000 gallons per day of wastewater, for a total of 370, 000 gallons per day. Assuming the proponent can provide supporting information for the exclusion of 110,000 gallons of wastewater flow, which is reported to be the existing flow, the proponent would need to eliminate 1.3 million gallons of infiltration and inflow from the municipal sewer system.

Massachusetts Contingency Plan/21E

The ENF indicates that several contaminated areas on site have been remediated under the Massachusetts Contingency Plan (MCP), Release Tracking Number (RTN) #3-0264, 3-020030,3-3681,3-0586 (merged with 3-0263), and 3-20684. Table 1-1 of the ENF contains an error in reference to the status of RTN 3-020030. A Class A-2 Response Action Outcome (RAO) has been filed for this RTN, not a Class C RAO as indicated in the Table. MassDEP's records also affirm that all other RTNs in Table 1-1 are in compliance with on-going document submittal requirements of the MCP.

The Northwest Industrial Park is within portions of the Zone II and the Zone III upland recharge area for the town of Burlington's seven municipal wells in the Vine Brook Aquifer. The Zone III in this area is a sandy till that is more permeable than most till deposits, and contributes significant water to the Vine Brook Aquifer. In 1989, MassDEP and the town of Burlington entered into a Consent Decree with twelve companies in the Northwest Industrial Park that had contributed contamination to the Vine Brook Aquifer. Through the Consent Decree, the companies provided money toward construction of a water treatment plant to remove volatile organic contaminants from the municipal well water.

The MassDEP Bureau of Waste Site Cleanup's (BWSC) past involvement in the Northwest Park has been with Building 28 and Building 37 (RTN 3-0263), located in Area B of the future development. Groundwater quality data from investigations in this area suggest that contamination increases with depth, such that the bedrock volatile organic carbon (VOC) concentrations are generally 20-fold greater than overburden VOC concentrations, (due to the density and low viscosity of chlorinated VOCs). The proposed Master Plan for Area B shows office buildings, retail space, and parking; no residential dwellings are proposed in this area. Redevelopment of Area B must maintain the existing treatment system and groundwater monitoring wells, which monitor changes in concentration of contaminants in the source area and downgradient plume. In addition, redevelopment must not prevent or impede the implementation of response actions.

Previous concentrations of trichloroethylene (TCE), detected in bedrock groundwater samples were sufficiently high to indicate that dense nonaqueous phase liquid (DNAPL) may be present in bedrock fractures (Buildings 28 and 37), although DNAPL was never observed. If blasting is proposed for the demolition and/or construction of the new buildings, an evaluation of the potential impacts of blasting in Area B is recommended, as it relates to the contaminant concentrations in groundwater, migration pathways, and impacts to the well field. Furthermore, an evaluation of the current design capacity of the town of Burlington's groundwater treatment system for VOCs may be warranted to ensure that it would be capable of dealing with an increase of VOC concentrations due to the proposed redevelopment work.

Several 21E sites, (Second Ave, Third Ave) are listed in Area A, where the Master Plan for Area A proposes retail, residential, office, and hotel space. An evaluation of possible vapor impacts to the indoor air quality of buildings in this area is recommended, to ensure that a migration pathway is not present. Blasting impacts also should be evaluated in Area A, as recommended for Area B. Furthermore, monitoring wells being used by ARCADIS for their annual groundwater monitoring will need to be maintained or replaced, as needed.

The impact of potential irrigation wells for Area A and Area B should be evaluated. A conceptual site model of groundwater flow for Areas A and B should be developed, to predict potential aquifer behavior and contaminant transport.

The proponent also will need to sustain an open dialogue with the surrounding property owners on contamination related issues that may result from redevelopment of the site. The Gutierrez Company now owns the M/A-COM, Inc. property, but Tyco maintains responsibility for response actions at the site. Although the ENF site plans appear to show that the M/A-COM property is not within the proposed redevelopment site, monitoring wells used by Tyco are in Area A, (in the vicinity of Victoria Station and Building 1) of the redevelopment plans. As such, future development and/or construction activities by Nordblom should not adversely impact the successful remediation at the M/A-COM Inc. site, in addition to other 21E sites within their redevelopment areas.

The proponent is proposing annual groundwater monitoring, at a minimum, and the ENF acknowledges that a Release Abatement Measure plan will be needed for some site work. The proposed redevelopment activities must not cause release conditions at these disposal sites to become worse than they otherwise would have been. Measures must be in place in the event that previously unknown soil and/or groundwater contamination is encountered during redevelopment activities to ensure the appropriate management of contaminated media is implemented and any required notification is provided to MassDEP and necessary response actions are conducted, as required by M.G.L. ch.21E and the MCP. The Environmental Impact Report should identify how construction activities will be coordinated with ongoing remedial activities at MCP sites in the Northwest Industrial Park.

Air Quality

The significant number of projected new daily vehicle trips triggers MassDEP's review threshold requiring the project proponent to conduct an air quality mesoscale analysis of Build and No Build conditions. The purpose of the mesoscale analysis is to determine whether and to what extent the proposed project will increase the amount of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the project area. The mesoscale analysis will also be used to determine if the project will be consistent with the Massachusetts State Implementation Plan (SIP). Emission increases due to the project must be mitigated and the subsequent environmental impact report should include the project proponent's commitment to implement said mitigation measures.

Requirements

Mesoscale Analysis

For the purpose of determining traffic impacts and site access evaluations, the project proponent must conduct an analysis of all roadway segments affected by the project, specifically the area within a 0.3 to 16 km radius of the project; the exact geographical area depends on local conditions and the impact of the project on area travel patterns. The area should be large enough to include all roadway links that could experience a 10% potential increase in traffic and which currently operate at or, will be degraded to, a Level of Service (LOS) D or lower.

The project proponent should consult with MassDEP staff and staff in the Massachusetts Environmental Policy Act (MEPA) office to determine the boundaries of each of the project alternatives, including the Existing condition in the Base Year, and the No-Build, Build and Build-with-Mitigation conditions in the project completion and project design years as appropriate. The current emission model,
MOBILE 6.2 should be used for this effort. VOC and NOx emissions for the Existing condition can be estimated using existing characteristics on the roadway segments. Emissions in the Build and Build-with-Mitigation conditions can be estimated by changing the traffic characteristics accordingly, on the roadway segments to those conditions that are expected to occur when the entire project is completed. VOC and NOx emissions for the No-Build condition for the future year can be similarly estimated.

If the mesoscale analysis indicates an increase in VOC and NOx emissions, which is expected given the large number of additional trips, then the project proponent must demonstrate a good faith effort to develop, implement or fund mitigation measures to offset these increases to the maximum extent possible. The project proponent should then conduct an analysis for the Build-with-Mitigation condition in the project design year to quantify the efficacy of the mitigation program.

Compliance with the Massachusetts Idling Regulation

The Massachusetts Idling regulation (310 CMR 7.11) prohibits motor vehicles from idling their engines more than five minutes unless the idling is necessary to service the vehicle or to operate engine-assisted power equipment (such as refrigeration units) or other associated power. The proponent should consider posting idling restriction signs on the premises to remind all drivers, patrons, and delivery personnel of the state's idling regulation. Questions regarding this regulation should be directed to Julie Ross of MassDEP at 617-292-5958.

Compliance with the Massachusetts Rideshare Regulation

MassDEP implements the Rideshare Regulation (310 CMR 7.16), a clean air program that applies to employers with 250 or more daily employees. The proponent or the future tenants of the project may or may not be subject to this regulation.

Employers subject to the Rideshare Program must implement a series of incentives that are designed to reduce the number of trips made by employees who drive alone to work. To date, employers with 1,000 or more employees and employers with 250 or more employees that are also subject to the Air Operating Permit Program (as detailed in MassDEP regulation, 310 CMR 7.00, Appendix C) must comply with the Rideshare regulation. Questions regarding this

regulation should be directed to Gail Costelas of MassDEP at 617-292-5663 for assistance in complying with this air quality program.

Recommendations

MassDEP recommends that the project proponent take all reasonable steps to mitigate the potential air quality impact associated with this project.

Transportation Demand Management (TDM) Measures

The project proponent should also consider implementing the following measures to reduce vehicle trips by employees and shoppers:

- *On-Site Vehicle Trip Reduction Coordinator.* MassDEP recommends that the proponent designate an on-site vehicle trip reduction coordinator to implement, promote and follow up on the use of the mitigation trip reduction measures.

- *Commuter Tax Benefit Program.* This transportation tax benefit program encourages employees to take transit or vanpools to work, providing transit and bus services are available within a mile of the project site. This program provides the added benefit of decreasing taxes for employers and employees.

- *Rideshare-Matching Program.* MassDEP recommends that the proponent establish a rideshare-matching program to match employees in carpools and/or vanpools. The project proponent could also enlist the services of a third-party provider to carry out this program.

- *Form or Join an Existing Transportation Management Association (TMA).* TMAs are organizations that help several employers in a local area develop and implement incentives that reduce traffic and trips to the worksite. Employers pay a fee for this service to a centralized coordinator to market and implement these incentives on their behalf.

- *Guaranteed Ride Home Program.* MassDEP recommends that the proponent establish an emergency ride home program for all project employees who travel by carpools/vanpools.

- *Bicycle Incentives.* MassDEP recommends that the proponent install adequate locker and shower facilities, and secure bicycle storage suitable for the various building uses on the site to increase bicycle use.

- *Preferential Parking.* MassDEP recommends that the proponent designate special, preferred parking spaces for carpools and/or vanpools as an incentive to encourage people to rideshare to work.

- *Shuttle.* To help reduce vehicle trips to the site, the project proponent should establish transportation shuttle service with links to nearby transit connections as well as other locations based on potential trip demand. Shuttle service should be designed and scheduled to serve the needs of employees, residents and shoppers alike. Shuttle service to/from the site scheduled coincident with the nearby commuter rail schedule could be particularly useful to the peak period service needs of employees and residents.

Construction Period Air Quality Mitigation Measures

MassDEP believes it is necessary to mitigate the construction-period impacts of diesel emissions to the maximum extent feasible and thus recommends that the project proponent

participate in the MassDEP Diesel Retrofit Program. Diesel emissions contain fine particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), which has been found to exacerbate a number of heath conditions, such as asthma and respiratory ailments. $PM_{2.5}$ also contributes to lung damage and has been identified as a likely carcinogen.

MassDEP recommends that the project proponent work with its staff to implement construction-period diesel emission mitigation, which could include the installation of after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). Please contact Soroosh Naderi at MassDEP at 617-556-1124 for further assistance.

In addition, MassDEP reminds the project proponent that off-road equipment engines must use low sulfur diesel (LSD) fuel in July 2007, as required by a 2004 regulation issued by the U.S. Environmental Protection Agency. On-road LSD fuel has a sulfur content of approximately 500 parts per million (ppm) in contrast to the 3,000 ppm sulfur level of current off-road diesel fuel. The use of LSD fuel, in conjunction with after-engine emission controls, can reduce $PM_{2.5}$ by an additional 25 percent beyond that obtainable with after-engine controls only. Project proponents may also use on-road ultra low sulfur diesel (ULSD) fuel, which has a sulfur content of 15 ppm. MassDEP also recommends that the project proponent require its contractor(s) to use ultra low diesel fuel (ULSD) in their off-road construction equipment in conjunction with after-engine emission controls. Additional information is available on the MassDEP website: http://www.state.ma.us/dep/brp/mf/files/diesel.pdf.

Recycling Issues

The project includes demolition and reconstruction, which will generate a significant amount of construction and demolition (C&D) waste. Although the ENF has not made a commitment to recycling construction debris (p.20), MassDEP encourages the project proponent to incorporate C&D recycling activities as a sustainable measure for the project.

The project proponent is advised that demolition activities must comply with both Solid Waste and Air Pollution Control regulations, pursuant to M.G.L. Chapter 40, Section 54, which provides:

> "Every city or town shall require, as a condition of issuing a building permit or license for the demolition, renovation, rehabilitation or other alteration of a building or structure, that the debris resulting from such demolition, renovation, rehabilitation or alteration be disposed of in a properly licensed solid waste disposal facility, as defined by Section one hundred and fifty A of Chapter one hundred and eleven. Any such permit or license shall indicate the location of the facility at which the debris is to be disposed. If for any reason, the debris will not be disposed as indicated, the permittee or licensee shall notify the issuing authority as to the location where the debris will be disposed. The issuing authority shall amend the permit or license to so indicate."

For purposes of implementing the requirements of M.G.L. Chapter 40, Section 54, MassDEP considers an asphalt, brick, and concrete (ABC) rubble processing or recycling facility, pursuant to the provisions of section (3) of 310 CMR 16.05 Site Assignment Regulations for Solid Waste Management Facilities, to be conditionally exempt from the site assignment requirements if

the ABC rubble at such facilities is separated at the point of generation from other solid waste materials. Under 310 CMR 16.05(3), ABC can be crushed on-site with just a 30-day notification to MassDEP. However, the asphalt is limited to weathered bituminous concrete (no roofing asphalt) and the brick and concrete must be uncoated or not impregnated with materials such as roofing epoxy. If the brick and concrete are not clean, e.g., coated and/or impregnated, the material is defined as construction and demolition (C&D) waste and requires either a Beneficial Use Determination (BUD) or a Site Assignment and permit before it can be crushed.

Pursuant to the requirements of 310 CMR 7.02 of the Air Pollution Control Regulations, if the ABC crushing activities are projected to result in the emission of one ton or more of particulate matter to the ambient air per year and/or if the crushing equipment employs a diesel oil fired engine with an energy input capacity of three million or more British thermal units per hour for either mechanical or electrical power which will remain on-site for twelve or more months, then a plan application must be submitted to MassDEP for written approval prior to installation and operation of the crushing equipment.

In addition, if it appears that significant portions of the demolition project contain asbestos, the project proponent is advised that asbestos and asbestos-containing waste material are a special waste as defined in the Solid Waste Management regulations (310 CMR 19.061). Asbestos removal notification on permit form ANF 001 and building demolition notification on permit form AQ06 must be submitted to MassDEP at least 10 working days prior to initiating work. Except for vinyl asbestos tile (VAT) and asphaltic-asbestos felt and shingles, the disposal of asbestos containing materials within the Commonwealth must be at a facility specifically approved by MassDEP (310 CMR 19.061). No asbestos containing material including VAT, and/or asphaltic-asbestos felts or shingles may be disposed at a facility operating as a recycling facility, (310 CMR 16.05). The disposal of the asbestos containing materials outside the jurisdictional boundaries of the Commonwealth must comply with all the applicable laws and regulations of the state receiving the material.

The demolition activity also must conform to current Massachusetts Air Pollution Control Regulations governing nuisance conditions at 310 CMR 7.01, 7.09 and 7.10. As such, the proponent should propose measures to alleviate dust, noise, and odor nuisance conditions, which may occur during the demolition. MassDEP must be notified in writing, at least 10 days in advance of removing any asbestos. MassDEP also must be notified in writing, at least 10 days prior to any demolition work. The removal of asbestos from the buildings must adhere to the special safeguards defined in the Air Pollution Control Regulations (310 CMR 7.15 (2)).

Facilitating future waste reduction and recycling and integrating recycled materials into the project are necessary to minimize or mitigate the long-term solid waste impacts of this type of development. The Commonwealth's waste diversion strategy is part of an integrated solid waste management plan, contained in The Solid Waste Master Plan that places a priority on source reduction and recycling. Efforts to reduce waste generation and promote recycling have yielded significant environmental and economic benefits to Massachusetts' residents, businesses and municipal governments over the last ten years. Waste diversion will become even more important in the future as the key means to conserve the state's declining supply of disposal capacity and stabilize waste disposal costs.

As the lead state agencies responsible for helping the Commonwealth achieve its waste diversion goals, MassDEP and EOEA have strongly supported voluntary initiatives by the private sector to institutionalize source reduction and recycling into their operations. Adapting the design, infrastructure, and contractual requirements necessary to incorporate reduction, recycling and recycled products into existing large-scale developments has presented significant challenges to recycling proponents. Integrating those components into developments such as the Northwest Park Redevelopment at the planning and design stage enable the project's management and occupants to establish and maintain effective waste diversion programs. Recycling areas should be easily accessible with minimal obstructions to trash receptacles and bins should be provided to owners/lessees with easy to understand educational materials on the recycling program. The use of trash chutes facilitates high levels of participation in recycling programs and has proven to reduce cleaning costs by 20 percent to 50 percent. Site designs that provide sufficient space and electrical services will support consolidating and compacting recyclable material and truck access for recycling material collection. Management intervention to field complaints and to keep track of the recycling services is necessary for a recycling program's success. Social marketing to promote public participation also improves waste recovery rates, as is well demonstrated by the effective recycling program described on the following residential development website: http://www.maplestreetapartments.com./lnw_rcp.htm.

By incorporating recycling and source reduction into the design, the proponents would have the opportunity to join a national movement toward sustainable design. Sustainable design was endorsed in 1993 by the American Institute of Architects with the signing of its *Declaration of Interdependence for a Sustainable Future.* The project proponent should be aware there are several organizations that provide additional information and technical assistance, including WasteCap, the Chelsea Center for Recycling and Economic Development, and MassRecycle.

In 2004, Massachusetts generated a total of 13.93 million tons of waste, including 8.72 million tons of residential and commercial waste and 5.16 million tons of construction and demolition waste (C&D). On average, this rate equates to each person in Massachusetts generating approximately 1.3 tons of waste a year, according to the MassDEP website: http://www.mass.gov/dep/recycle/priorities/dswmpu01.htm - recycling.

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Jack Zajac at (978) 694-3240 for further information on the wastewater issues, Rachel Freed at (978) 694-3258 for wetlands issues, and Leticia Ruiz-Boyle at (978) 694-3352 regarding the MCP. Should you have any questions on air quality issues, please contact Jerome Grafe at (617) 292-5708. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Jerome Grafe, MassDEP-Boston
Richard Chalpin, Tom Mahin, Stephen Johnson, Kevin Brander, Rachel Freed, James Persky, Joanne Fagan, Jill Provencal, Jack Zajac, Leticia Ruiz-Boyle, MassDEP-NERO
Town of Burlington, Planning Board, Conservation Commission

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October 17, 2007

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Northwest Park Redevelopment
PROJECT MUNICIPALITY	: Middlesex Turnpike - Burlington
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 14000
PROJECT PROPONENT	: Nordblom Company
DATE NOTICED IN MONITOR	: September 10, 2007

As Secretary of Energy & Environmental Affairs, I hereby determine that the Draft Environmental Report (DEIR) submitted on the above project **adequately and properly** complies with the Massachusetts Environmental Policy Act (G. L., c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00).

Project Description

As described in the DEIR, the proposed project consists of the redevelopment of Northwest Park into approximately 3.28 million square feet (sf) of mixed-use development. The Mixed-Use Phase or Area A includes approximately 1.28 million sf of space. It is comprised of approximately 300 residential units, 600,000 sf of retail/restaurant space, an approximately 200-room hotel, 260,000 sf of general office space, and additional open space. Area A is approximately 48 acres. The Office Phase or Area B includes approximately 2 million sf of general office space. Area B is approximately 79 acres. Both Areas A and B will be constructed simultaneously. The existing project site contains approximately 1.34 million sf of existing office space with some commercial uses with parking for 4,830 cars in surface lots. These buildings will be demolished or reconfigured to make way for the proposed project. The site is adjacent to Route 3 and close to I-95 (Route 128). It is comprised of approximately 127 acres, between Route 3 and the Middlesex Turnpike.

The project requires a mandatory EIR. It will require an Indirect Access Permit and

Traffic Signal Permits from the Massachusetts Highway Department (MassHighway). The project may require a Construction Dewatering Permit, a Notice of Construction & Demolition, a Limited Air Plan Approval/Fossil Fuel Emission Permit, a Notice Regarding Demolition and Construction, a Modification Permit for the water distribution system, a Cross Connection Permit, and a Sewer Extension/Connection Permit from the Department of Environmental Protection (MassDEP). It may need to obtain a Construction Dewatering Permit from the Massachusetts Water Resources Authority (MWRA). The project may require a blasting permit from the State Fire Marshall's Office. It must comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges from a construction site. The project may require a Programmatic General Permit from the U.S. Army Corps of Engineers. An Order of Conditions will be required from the Burlington Conservation Commission for impacts to wetland resource areas and buffer zones. MEPA jurisdiction extends to land alteration, traffic, air quality, wetlands, stormwater, blasting, water, and wastewater issues that may have significant environmental impacts.

Using the unadjusted Institute of Traffic Engineers Trip Generation land use codes (220, 310, 710, and 820), the proponent has estimated that the project will generate approximately 39,735 average weekday (unadjusted) vehicle trips and approximately 36,930 Saturday trips. The proponent has estimated that the project would generate about 20,990 net new vehicle trips on a weekday and 23,070 trips on Saturday when adjustments are made for shared, pass-by, diverted link, and existing vehicle trips. Access to the project site from the regional highway system would be provided from Second, Third, and Fourth Avenues to the Middlesex Turnpike and to I-95 and to Route 62 and its interchange with Route 3. The proponent has estimated that the project will require 12,040 shared parking spaces in structured and surface facilities.

The proposed project will be connected to existing municipal water and sewer service. It will consume approximately 412,460 gallons per day (gpd) of water (daily design flow) and will generate approximately 374,963 gpd of wastewater flow (Title 5).

Review of the DEIR

The DEIR included a detailed description of the project with a summary/history of the project. It described each state agency action required for the project. The DEIR contained sufficient information to allow the permitting agencies to understand the environmental consequences related to the project. It discussed how this project is compatible with Executive Order 385 – Planning for Growth, by discussing its consistency with local zoning, and the Metropolitan Area Planning Council's *Metro Plan*.

In the DEIR, the proposed trip generation numbers utilized the Institute of Traffic Engineers' land use codes. The DEIR presented the credit assumptions for existing, internal captured, pass-by and diverted link and specified which land use they were applied to. It

explained how the trip generation numbers were developed.

The DEIR provided for the analysis of impacts on the level of service (LOS) at the intersections that were required in the Certificate on the ENF dated May 11, 2007. It also included a LOS analysis of the Route3/Route 128/I-95 interchange. The LOS analysis in the Traffic Study included the a.m. and p.m. weekday peak hours, Saturday midday peak hour, volume to capacity ratios, a traffic distribution map, and background growth from other proposed developments in the area. The DEIR presented the traffic generated by the other projects undergoing MEPA review in the background traffic numbers. Because the Mixed Use Phase (Area A) and the Office Phase (Area B) will now be constructed simultaneously by the proponent, the DEIR used 2016 as its build year. MassHighway has agreed to this build year. For each intersection in the study area, the DEIR included with its LOS analysis: time delay, capacity, and a summary of the average and 95th percentile vehicle queues. The DEIR included a traffic signal warrant analysis for the unsignalized intersections at Third Avenue/Middlesex Turnpike and Second Avenue/South Street.

The DEIR presented merge, diverge, and weave analysis for each ramp junction at the I-95/Route 3/Middlesex Turnpike and its frontage roadways and the Route 3/Route 62 interchanges. In its response to comments section, the DEIR addressed how the project intends to accommodate service and loading functions.

The DEIR described Burlington's parking supply requirements (zoning). It identified the local bus routes and their scheduled hours. Transit services are operated by the MBTA, the Town of Burlington (B-Line), and the Lowell Regional Transit Authority. There were no capacity constraints on the transit services that were identified in the DEIR.

The DEIR showed existing and proposed pedestrian facilities in the study area. It identified that the project would include a one-mile shared path and three miles of sidewalks as the proposed bicycle facility improvements included with this project.

The DEIR provided a mesoscale air quality analysis. The mesoscale analysis for ozone assessed the total ozone precursor (volatile organic compounds and nitrogen oxides) emissions associated with all project-related vehicle trips. Because ozone precursor emissions from the preferred alternative are greater than the no-build case, reasonable and feasible ozone precursor reduction/mitigation measures were included in the DEIR. While the project was filed with MEPA prior to the adoption of the EEA Greenhouse Gas (GHG) Emissions Policy, the proponent has voluntarily quantified GHG emissions generated by the proposed project and identified measures to avoid, minimize, or mitigate GHG emissions.

The DEIR discussed several project alternatives in an attempt to avoid wetland impacts.

Where unavoidable impacts occur, impacts are minimized and mitigated. The DEIR illustrated that the impacts have been minimized and that the project will be accomplished in a manner that is consistent with the Performance Standards of the Wetlands Regulations (310 CMR 10.00). The resource area boundaries, riverfront areas, applicable buffer zones, and 100-year flood elevations were delineated in Figure 5.1. The Bordering Vegetated Wetlands (BVW), which have been delineated in the field, were surveyed, mapped, and located on the plans. Each wetland resource area and riverfront area has been characterized according to 310 CMR 10.00. The Burlington Conservation Commission has accepted the resource area boundaries. The DEIR has identified that the project will impact the following wetland resource areas: 370 lf of Bank, 1,400 sf of BVW, and 420,000 sf of Bordering Land Subject to Flooding. A detailed wetlands replication plan was provided in the DEIR The proponent is proposing to restore 370 feet of Bank and to replicate 7,500 sf of BVW.

The DEIR presented drainage calculations and detailed plans for the management of stormwater from the proposed project. It included a detailed description of the proposed drainage system design, including a discussion of the alternatives considered along with their impacts. The DEIR identified the quantity and quality of flows. It described the rates of stormwater runoff for the 2, 10, 25 and 100-year storm events. The DEIR addressed the performance standards of MassDEP's Stormwater Management Policy. It identified the groundwater recharge issues. Appendix E of the DEIR contained a maintenance program for the drainage system. This maintenance program outlined the actual maintenance operations, a twice per year sweeping schedule, responsible parties, and back-up systems. The proponent has committed to use a non-sodium based deicer on pavement surfaces. The DEIR summarized the existing pre-construction groundwater conditions.

The DEIR did not identify any impacts from the project on the drinking water supply and distribution system. No alternative water supply sources were considered. The DEIR outlined the proponent's efforts to reduce water consumption and thereby reduce wastewater generation. The proponent considered implementing several Low Impact Design (LID) features for the wastewater system.

The DEIR presented a discussion on potential construction period impacts and analyzed feasible measures, which can avoid or eliminate these impacts. It estimated that approximately 495,000 cubic yards of fill may be hauled off-site. The DEIR provided a landscaping plan in Figure 1.4.

The DEIR presented a summary of the results of hazardous waste studies and remediation efforts undertaken at the project site by the proponent and others to comply with the Massachusetts Contingency Plan (MCP).

The FEIR should resolve all the remaining issues outlined below, as required by this Certificate. It should include a copy of this Certificate.

Project Description & Regulatory Environment

The FEIR should include a detailed description of the project with a summary/history of the project. It should briefly describe each state agency action required for the project. The FEIR should demonstrate how the project is consistent with the applicable performance standards. It should contain sufficient information to allow the permitting agencies to understand the environmental consequences related to the project.

Alternatives Analysis

In addition to the No-Build Alternative and the Preferred Alternative (3.28 million sf), the FEIR should develop an alternative that maximizes site layout and sustainable design/Low Impact Development (LID) opportunities to minimize water, wastewater, stormwater and wetland impacts. The FEIR should identify the impacts of each of the alternatives, on traffic, parking, transit, pedestrian/bicycle facilities, transportation demand management, air quality, wetlands, drainage, drinking water, wastewater, construction, visual aesthetics (building renderings), blasting, and sustainable design. It should provide a comparative analysis that clearly shows the differences between the environmental impacts associated with each of the alternatives.

Traffic

A full Roadway Segment Analysis (RSA) for the Middlesex Turnpike between Route 62 and Wheeler Road West should be conducted by the proponent in the FEIR. The RSA should include access management along the corridor, traffic signal warrant analysis at the major driveways/intersections, traffic signal coordination/interconnection, and providing sufficient capacity (two through travel lanes in either direction with left/right turning lanes) along the Middlesex Turnpike.

Parking

Parking at the site has increased from the ENF to the DEIR from 8,620 to 12,040 spaces in parking garages and surface lots or 3.67 spaces per 1,000 sf of space. There was no identified increase in the project size to justify this increase in parking spaces. The FEIR must provide a breakdown of parking needs by land use category/use, time of day, and employee/customer/ resident/visitor category to demonstrate the need for the proposed 12,040 spaces. The parking needs assessment should take into account the turnover rates for employees, customers,

residents, valet parkers, and visitors, and parking fees. The FEIR should describe how the number of parking spaces needed was determined. Parking demand management should be a key component of the overall mitigation analysis. The FEIR should identify the proposed parking fees for the various project uses. The proponent should consider using the ULI Minimum Parking Rate of 9,209 spaces or 8,856 spaces, which is 2.7 spaces per 1,000 sf of space. The number of 2.7 spaces per 1,000 sf of space was utilized by the proponent for the Westwood Station project (EEA #13826), which is a similar mixed-use redevelopment project. Any valet parking operations for the proposed project should be described in the FEIR. The FEIR should identify taxi-parking areas along curbs and reserved parking for Zip Car or a similar service within the parking garages.

Pedestrian/Bicycle Issues

The FEIR should show where traffic calming measures are proposed. The proponent should provide pedestrian connections and signage to the Burlington Mall, and the FEIR should include a Figure displaying these connections. The FEIR should show where temporary and longer visit bicycle parking would occur on the project site. It should show the number of bicycle parking spaces and their location on the project site.

Transit

The FEIR should identify private shuttle bus routes in the area operating to the Anderson Transportation Center or other transit centers. It should identify the specifics and amount of its transit subsidy to employees for monthly transit passes.

Transportation Demand Management

The FEIR should present a comprehensive Transportation Demand Management (TDM) Program designed to minimize reliance on single passenger vehicle trips for employees at Northwest Park.

Air Quality

The FEIR should provide the 2016 No-Build baseline information for CO2 emissions. The proponent should consider additional sustainable design principles and TDM measures to offset the difference in the 2016 No-Build and the 2016 Build scenarios. In the FEIR, the proponent should commit to landscape screening and filtering methods that will keep potentially harmful pollutants away from the new residences at this site, which is within 1,000 feet of a high volume roadway (Route 3). MassDEP recommends that the proponent fund a shuttle bus service linking the project with the Anderson Regional Transportation Center to improve air quality. The

FEIR should specify mitigation measures to reduce GHG emissions and characterize the expected benefits of that mitigation.

Wetlands

The FEIR should explain the proposed compensatory flood storage area or show the areas that would be altered and replaced. It should also demonstrate that the wetlands replication areas are designed in accordance with MassDEP's *Massachusetts Inland Wetland Replication Guidelines,* March 2002, as recommended by MassDEP.

Drinking Water

The FEIR should explain the subsurface conditions where stormwater infiltration is proposed in the wellhead protection area to demonstrate that the project impacts are within regulatory compliance. It should evaluate the potential for irrigation wells in both Areas A and B. The FEIR should identify the potential alternative deicing agents to be used at the project site.

Wastewater

According to MassDEP, the proponent will need to eliminate 1.3 million gallons of Infiltration/Inflow (I/I). The proponent should consider the installation of High Efficiency Toilets throughout the project to reduce water demand. The FEIR should identify any capacity deficiencies within the municipal wastewater system to handle the project's additional wastewater flows. The FEIR must address this I/I issue and work closely with the Massachusetts Water Resources Authority (MWRA), MassDEP, and the Town of Burlington.

Stormwater Management

The FEIR should discuss consistency of the project with the provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit from the U.S. Environmental Protection Agency for stormwater discharges from construction sites. It should include a discussion of best management practices employed to meet the NPDES requirements, and it should include a draft Pollution Prevention Plan. Any discrepancies between the stormwater management plan for this project and the Town of Burlington's stormwater program should be resolved before proceeding with this project. The FEIR should consider additional Low Impact Development (LID) measures that minimize the volume of stormwater runoff to be treated and controlled by maintaining the existing hydrologic functions. In its comment letter, MassDEP has recommended that LID techniques should be incorporated into the drainage plan early in the project design phase. The FEIR should consider other LID tools to reduce the amount of impervious areas. It should describe if any dewatering of the construction site will include

monitoring to ensure that there is no impact to the groundwater level. The FEIR should outline the monitoring program of groundwater levels.

The FEIR should address MassDEP's concerns regarding conformance to the Critical Area Standard 6. It should identify measures to contain stormwater runoff in the event of an emergency spill. Any storm drains that discharge toward Vine Brook should be consistent with the Town of Burlington's NPDES General Permit. The snow disposal plan for the project should show the location on- or off-site where snow will be plowed or disposed. The FEIR should explain rainwater reuse for irrigation.

Construction/Community Disruption

The FEIR should outline how this proponent will coordinate its construction program with other nearby projects. It should identify the number of truck trips required to handle the filling operation and the truck routes for fill removal. The FEIR should describe any blasting proposed at the project site. It should identify the proponent's plans to deal with blasting and the notification process to adjacent land owners and local officials.

Visual/Aesthetics

The FEIR should include an analysis of the visual impacts of the proposed project, including renderings of the proposed buildings. In the FEIR, the proponent should incorporate native plants and low water using landscape materials in this plan.

Hazardous Waste

The FEIR should identify how construction activities will be coordinated with the ongoing remedial activities at MCP sites at the project site. It should address MassDEP's concerns regarding hazardous waste issues. According to MassDEP, a comprehensive groundwater monitoring plan capable of monitoring contaminant concentrations in overburden, shallow bedrock, and deep bedrock groundwater will be necessary during construction and blasting activities.

Sustainable Design/Low Impact Design (LID)

To the maximum feasible extent, the proponent should incorporate additional sustainable design elements into the project design. The FEIR should summarize the proponents' efforts to ensure that this project includes Leadership in Energy and Environmental Design (LEED) Certified buildings or the equivalent. The basic elements of a sustainable design program may include, but not be limited to, the following measures:

- optimization of natural day lighting, passive solar gain, and natural cooling;
- use of energy efficient HVAC and lighting systems, appliances and other equipment, and use of solar preheating of makeup air;
- favoring building supplies and materials that are non-toxic, made from recycled materials, and made with low embodied energy;
- provision of easily accessible and user-friendly recycling system infrastructure into building design;
- development of a solid waste reduction plan;
- development of an annual audit program for energy consumption, waste streams, and use of renewable resources;
- LID principles that reduce stormwater, potable water, wastewater, and wetland impacts and that provide water conservation and the reuse of wastewater and stormwater; and
- LEED certification.

Mitigation

The FEIR should include a separate chapter on mitigation measures. It should develop transportation and parking demand management measures to reduce single passenger automobile trips to the project and encourage ridesharing to the site through the use of preferential parking. I encourage the proponent to identify measures to increase transit usage to the project site. This chapter on mitigation should include a Draft Section 61 Finding for all state permits. The Draft Section 61 Findings should contain clear commitments to mitigation, estimates of the individual costs of the proposed mitigation, and the identification of the parties responsible for implementing the mitigation. A schedule for the implementation of mitigation should also be included, which should describe any phasing of the mitigation.

In the DEIR, the proponent has committed to the following mitigation measures:

- Provide a minimum increase of 10 percent above the existing infiltration volume of groundwater into the surrounding aquifer.
- Implement a General Environmental Management Plan to clean up hazardous waste contamination, approximately $650,000.
- Provide approximately 1.38 million gpd of I/I removal for project's added wastewater flows to the municipal system, between $1 and $2.2 million.
- Fund the Town of Burlington for a Town Sewer Study to identify wastewater I/I projects up to $300,000.
- Provide an independent sewer study, approximately $50,000.
- Utilize ultra-low sulfur diesel fuel in construction vehicles.
- Replicate 7,500 sf of BVW, provide 370 feet of bank mitigation and maintain the same

floodplain volume, approximately $150,000.

- Fund a Regional Transportation Master Plan for the area to identify and address long-term transportation improvements, approximately $150,000.
- Designate 10 percent of the housing units as affordable units to comply with the Commonwealth's affordable housing policies.
- Install a fully-actuated traffic signal at the Middlesex Turnpike/Third Avenue intersection, make geometric improvements, and coordinate the new signal with the next three signals along the Turnpike to the north, approximately $600,000.
- Modify traffic signal phasing and timings at the Middlesex Turnpike/Second Avenue/ Burlington Mall Road (BMR) intersection and make geometric improvements with accommodations for pedestrians and bicycles, approximately $1.2 million.
- Install a fully-actuated traffic signal at the South Avenue/Second Avenue intersection, coordinate the new signal with the signal at Middlesex Turnpike/Second Avenue/BMR, and make geometric improvements with accommodations for pedestrians and bicycles, approximately $400,000.
- Design signal timing modifications and geometric improvements with pedestrian accommodations at Middlesex Turnpike/Fourth Avenue, approximately $250,000.
- Provide signal phasing and lane reconfigurations at Route 62/Network Drive, approximately $10,000 (provided by the Tri –Town Commission).
- Provide 100 percent design plans for the full buildout of the interchange and widen the northbound Middlesex Turnpike approach to provide a 4-lane cross-section and turn lane between Wheeler Road to a point past the I-95 northbound ramps at the Middlesex Turnpike/I-95 Northbound Ramps/Wheeler Road intersection, approximately $850,000.
- Provide 100 percent design plans for the full buildout of the interchange and install queue detection on the southbound off-ramps and coordinate with the traffic signal system along the Middlesex Turnpike at the Middlesex Turnpike/Route 128/I-95 Southbound interchange, approximately $275,000.
- Design and construct the continuation of the right-hand lane through the weaving section on the Route 128/I-95 Southbound frontage road between the Middlesex Turnpike on-ramp and the Route 3 Northbound on-ramp and other geometric improvements, approximately $100,000.
- Provide signal timing modifications after the occupancy of each 300,000 sf by the proponent at the following intersections: Route 62/Route 3 Southbound Ramps; Route 62/Route 3 Northbound Ramps/Crosby Drive; Route 62/Middlesex Turnpike; Middlesex Turnpike/Terrace Hall Avenue; and Middlesex Turnpike/South Avenue/Burlington Mall Driveway ($5,000 per visit per intersection).
- Modify the signal timing at the BMR/Marriott Driveway, approximately $5,000.
- Construct three miles of sidewalks and a one mile of a shared-use (bicycle/pedestrian) path on the project site and provide short- and long-term bicycle parking facilities throughout the project, approximately $250,000.

- Provide street sweeping within the project site.
- Install a stormwater management system with water quality treatment units, between $700,000 and $1 million.
- Install water-efficient appliances and fixtures (low flush toilets and faucet aerators).
- Utilize low-demand irrigation plantings.
- Provide the following to reduce GHG emissions: high-albedo roofing materials; high-efficiency HVAC systems with little or no refrigerants; use peak shaving or load shifting energy strategies; maximize interior day lighting by the use of skylights and light wells; incorporate window glazing to balance day lighting, heat loss, and solar heat gain; incorporate super insulation; install energy motion sensors for lighting and building climate control
- Provide a TDM program with an on-site coordinator and commuter information.
- Provide spaces for a car-sharing service, such as ZipCar.
- Implement a Construction Management Plan (includes traffic).
- Evaluate applying to the LEED-Neighborhood Development (ND) Program.

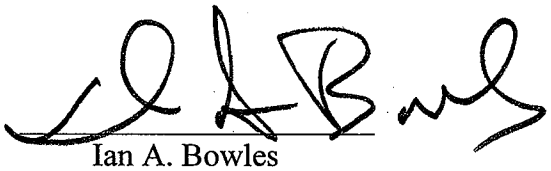
The FEIR should determine the amount of the proponent's contribution toward the additional mitigation measures required at the Middlesex Turnpike/Route 128/I-95 northbound and southbound ramps to alleviate existing roadway deficiencies and future project impacts. At the northbound ramps, the proponent has identified that the northbound on- and off-ramps should provide additional queuing and operational enhancements ($700,000) and that the northbound Middlesex Turnpike beneath the Route 128 overpass should be widened and provided with signal timing modifications ($550,000). At the southbound ramps, the proponent has identified that the southbound on- and off-ramps should be provided with additional queuing and operational enhancements to the signal system ($600,000) and that the northbound Middlesex Turnpike approach should be widened and provided with signal timing modifications. The proponent should coordinate the traffic signals along the Middlesex Turnpike from the Middlesex Commons Mall entrance to the Network Drive intersection. I urge the proponent to participate in any discussions and studies, which evaluate the feasibility of traffic, transit, pedestrian and bicycle improvements within this area.

Response to Comments

The FEIR should respond to the comments received to the extent that the comments are within the subject matter of this scope. Each comment letter should be reprinted in the FEIR. I defer to the proponent as it develops the format for this section, but the Response to Comments section should provide clear answers to questions raised.

Circulation

The FEIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should also be sent to the list of "comments received" below and to local officials in Burlington and Bedford. It should be sent to the Lexington Town Administrator. A copy of the FEIR should be made available for public review at the Burlington and Bedford Public Libraries. The proponent should provide a hard copy of the FEIR to each state agency from which the proponent will seek permits or approvals and to Burlington's commenting agencies.



October 17, 2007
DATE

Ian A. Bowles

Comments received:

VHB, 9/27/07
MassDEP/NERO, 10/10/07
EOT, 10/10/07
MAPC, 10/11/07
VHB, 10/12/07

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COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
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DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

October 10, 2007

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Burlington
Northwest Park Redevelopment
Middlesex Turnpike
EEA # 14000

Attn: MEPA Unit

Dear Secretary Bowles:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the Draft Environmental Impact Report (DEIR) submitted by the Nordblom Company to demolish several existing industrial/ commercial buildings in order to construct a 3,280,000 square foot mixed use project comprised of about 1.3 million square feet of housing, retail, and office space in Area A, and 1.9 million square feet of new and redeveloped office space in Area B on a 127 acre site in Burlington (EEA #14000). The development plan includes about 300 units of housing, 600,000 square feet of retail with restaurant space, 1,900,000 square feet of office/commercial, a 200 room hotel, other uses, (e.g., child/adult day care, medical facilities, theatre, health club, community center), 8,700 parking spaces, and infrastructure, which will be built out over about a 10 year period. The Department provides the following comments on this project.

Wetlands

The DEIR indicates that the proposed project would alter 370 feet of bank, 1,400 square feet of bordering vegetated wetland (BVW), and confirms that the project would alter 420,000 square feet of bordering land subject to flooding, and the locations of the wetlands and proposed alteration are shown on Figures 5.1 and 5.2. Evaluation of the volume of the floodplain on an incremental basis is considered unreasonable because of the steep slopes. Existing flood storage volumes will be maintained between elevation 141 and 128. However, the DEIR does not explain the proposed compensatory flood storage or show the areas that would be altered and replaced. This should be addressed in the next EIR.

Wetlands mitigation plans in Figure 5.3 illustrate the area of mitigation for about 370 feet of bank and 7,500 square feet of BVW replication. Portions of the proposed mitigation are within

the buffer zone for Wetland 3. The next EIR should demonstrate that the wetlands replication is in accordance with the MassDEP *Massachusetts Inland Wetland Replication Guidelines*, March 2002.

Stormwater

The conceptual description of the proposed stormwater management system suggests that the proposed design could satisfy the Stormwater Management Policy and standards. However, there is not enough supporting information in the DEIR to confirm that the system would be sufficient. Peak rates of the proposed development have been shown to be less than pre-development conditions. However, there are no calculations for water quality volume or estimates of the infiltration volumes to show that the project would conform to the Critical Area Standard 6. The drainage technical Appendix D included only a single total suspended solids (TSS) calculation sheet, which is not associated with a drainage area and drainage point. Since the Appendix also shows four drainage points, it was expected that there would be 3-4 TSS calculation sheets to correlate with these downstream discharge points. The DEIR also has not identified any measures to shut off or contain stormwater runoff in the event of an emergency spill or unexpected contamination release. Although particle separators are identified for use in the stormwater control system, the size and type of units have not been determined. The next EIR should address these issues.

The NPDES Stormwater General Permit for the town of Burlington identifies Vine Brook as an impaired waterbody due to pathogens. To address this issue, the town is proposing to implement control measures to reduce pathogens contributed by storm sewers to Vine Brook. The next EIR should consult with the town regarding the proposed storm drains that discharge toward Vine Brook to ensure that the proposed design is consistent with the municipal plans. Consideration should be given in the next EIR to the effectiveness of the proposed and alternative stormwater best management practice designs in controlling pathogens.

MassDEP also reminds the proponent that pollution prevention and source control measures are required for compliance with the total suspended solids Standard 4 in the Stormwater Management Policy. The source control and pollution prevention plan for this project should specify that snow shall not be plowed toward the wetlands and that snow shall be managed in accordance with the MassDEP Snow Disposal Guidelines. These guidelines are available at the following MassDEP website: http://mass.gov/dep/water/laws/policies.htm - storm. The snow disposal plan should show the location on or off-site where snow will be plowed or disposed. The plan also should commit to using the minimum amount of deicing and abrasive agents, and include catch basin stenciling to discourage illicit discharges to storm drains on site.

Low Impact Development

The DEIR indicated that consideration of low impact development (LID) would be deferred until final design and local permitting. The Department requests that LID measures be more fully evaluated in the next EIR. Where feasible, LID should be incorporated into the drainage plan early in the project design. The proponent is advised that revisions to the SMP and incorporation of the policy into the wetlands and 401 Water Quality Certification regulations will take effect on January 2, 2008. These regulations include a requirement that LID techniques be considered.

Water Supply

Although the DEIR indicates that the infiltration system would increase recharge to the wellhead protection area, (Zone II and Zone III), for the town of Burlington's public water supply wells, there is not enough information on the design and locations of the stormwater infiltration systems to demonstrate that this would be accomplished. In addition, without information on the locations of the systems and groundwater conditions in the vicinity of those subsurface systems it is not possible to show that the stormwater management system would protect the water supply from contamination, associated with stormwater runoff and historic site contamination. The Department had requested in its comment on the ENF that the EIR should explain the subsurface conditions where stormwater infiltration is proposed in sufficient detail to demonstrate the project related impacts would be avoided, minimized, and mitigated, in conjunction with regulatory compliance.

The proponent has made a commitment to prohibit the use of road salt in parking areas and access roadways within the town of Burlington's Aquifer and Water Resources District. Sand is proposed with other agents, which have not been specified. What deicing agents are being considered, and how will the use of these alternative materials be controlled to a minimum? The use of large volumes of sand will require a more frequent and comprehensive street sweeping plan. What is proposed?

Landscape watering would need to be restricted because the town bylaws do not permit potable water for irrigation. To address this restriction, the proponent is planning to use native vegetation and planting that requires minimal water. Rainwater reuse for irrigation also is mentioned, but not explained in the DEIR.

Wastewater

The DEIR acknowledges that the project would increase sewer flow by 275,295 gallons per day; total wastewater flow also has increase to 374,963 gallons per day. The DEIR did not provide information to demonstrate the exclusion of 110,000 gallons of wastewater flow, which is reported to be the existing flow, therefore, it is unclear whether the proponent will need to remove the proponent would need to eliminate 1.38 million gallons of infiltration and inflow from the municipal sewer system or more (up to a maximum of 1.88 million gallons of I/I).

The proponent has independently performed a Phase I sewer monitoring program, and the DEIR includes an area overview map, Figure 7.5, showing a section of 12 inch and 18 inch sewer that extends beneath Route 128 which is considered a potential source of I/I. A Phase II study to pinpoint the exact locations of I/I is planned. The DEIR also indicates that the proponent has made a commitment to the town to fund a sewer study, which may be the basis for the I/I removal commitments for this project. Otherwise, the proponent is planning to pay sewer mitigation fees. The Department strongly supports efforts to identify specific I/I mitigation projects as part of the MEPA review, to avoid permitting delays due to unclear mitigation commitments. Because sewer flows from the project area could exacerbate sanitary sewer overflows from the Horn Pond Interceptor, where overflow events continue to occur, issuance of a permit without scheduled plans for I/I removal would be in violation of the Administrative Consent Order with the town of Burlington and the Massachusetts Policy Act, M.G.L. Section 61. The MEPA regulations in 301 CMR 11.00 direct agencies in "(u)sing all feasible means to

avoid Damage to the Environment or to the extent Damage to the Environment cannot be avoided, to minimize and mitigate Damage to the Environment to the maximum extent practicable." The proponent also was advised by MassDEP in its ENF comments that the flow "credit" currently available in the Burlington sewer bank is insufficient to offset wastewater flows from this entire project. The Department also invited the proponent to arrange a meeting with the town and MassDEP to discuss approaches to meet the requirements of the Burlington sewer bank and the MassDEP ACO. However, the Department had no response to this invitation.

Air Quality

Summary of VOC and NOX Analysis

The DEIR contains an air quality mesoscale analysis of VOC and NOX emissions from mobile sources. The results of the analysis show increases in VOC and NOX emissions with the Build Condition compared to the No Build Condition. The proposed mitigation package analyzed for the Build with Mitigation Condition includes roadway and signal improvements and TDM measures. The proposed mitigation will provide a partial reduction in predicted emissions increases.

Recommendations

The DEIR indicates, "While the mesoscale analysis does not quantify the emission reductions from proposed TDM mitigation measures, their implementation is expected to result in additional improvements to the air quality in the study area." MassDEP concurs with this statement and recommends a greater project commitment than simply "suggesting" the list of additional TDM measures for the office, retail, and residential portions for this project. MassDEP recommends implementation of these additional TDM measures as listed on pp.4-6 and 4-7 in the DEIR. As an added measure, MassDEP also recommends a project commitment of support and funding as necessary, to a shuttle service linking the project with the Anderson Regional Transportation Center. These recommendations would also reduce CO_2 emissions as discussed below.

Summary of GHG Analysis

The DEIR contains an analysis of the project's greenhouse gas (GHG) emissions. The proponent performed the GHG analysis pursuant to the MEPA Certificate dated May 11, 2007 and the Draft MEPA Greenhouse Gas Emissions Policy and Protocol dated July 11, 2007. This Project is one of the first projects to conduct a GHG analysis under the Draft MEPA Policy.

The GHG analysis calculates the project's carbon dioxide (CO_2) emissions from stationary and mobile sources. Total CO_2 emissions were determined by combining the emissions from the mesoscale analysis of mobile source CO_2 emissions with stationary source CO_2 emissions. The stationary source emissions include both direct, (on-site energy consumption), and indirect, (off-site energy) ,building sources, (e.g., for electricity, district heating).

Mobile source CO_2 emissions were calculated following similar procedures used for the mesoscale analysis of VOC and NOX emissions. CO_2 emission rates were developed using EPA's Mobile 6.2 emissions model with Massachusetts' specific model inputs and conditions. The GHG analysis also uses the same traffic data on speeds, flow characteristics, and roadway capacity; but used yearly traffic volumes for weekdays and weekends, instead of the daily peak and off-peak summer volumes typically used in VOC and NOX mesoscale analyses. The mobile source analysis

was conducted for four conditions: 2006 Existing, 2016 Build, No Build, and Build with Improvements.

Direct, (onsite energy consumption), and indirect, (offsite energy generation), stationary sources of CO2 emissions were calculated using the EQUEST model, which is one of several energy use models considered appropriate for this purpose according to Draft MEPA GHG Emissions Policy. Emission calculations were performed for two scenarios: 1) use of typical building materials for the 2016 Build condition, and 2) use of certain improved building materials for the Build with Improvements condition. The stationary source analysis was conducted for 2016 Build and Build with Improvements. Unlike the mobile source analysis, it did not include the 2006 Existing condition or the 2016 No Build condition as a baseline for comparison. This omission is discussed below.

Results of Mitigation

Mobile Sources

The mitigation of CO_2 emissions from mobile sources relies on the same measures proposed to reduce the VOC and NOX emission impacts. The DEIR reports that the proposed roadway, signal improvements and TDM measures "(a)re also expected to reduce CO_2 emissions related to Project-induced mobile sources." Even with the implementation of these measures, CO_2 emissions are predicted to increase by 22,572 tpy for the 2016 Build with Improvement condition compared to the 2016 No Build condition (Table 4.3). This result contradicts the assertion on page 4-10 that CO_2 emissions would decrease by almost 19,000 tpy in the 2016 Build with Improvement condition, as compared to the 2016 No Build condition. The discrepancy is significant and should be corrected and documented in the Final Environmental Impact Report.

Stationary Sources-- Indirect Emissions

The DEIR contains no information on opportunities to avoid, minimize, or mitigate *indirect* impacts. More consideration should be given to other offset measures, such as a commitment to purchasing electricity generated from renewable energy sources, or generating renewable energy on-site.

Stationary Sources-- Direct Emissions

The mitigation of *direct* CO_2 emission sources included in the "Build with Improvements condition" relies on a number of sustainable design elements including several suggested mitigation measures listed in the Draft MEPA GHG Emissions Policy. Although no definition of "typical building materials" associated with the Build condition is provided, the presumption is that the proposed sustainable design elements, including improved building materials and rooftop equipment, will yield the calculated CO2 emission reductions.

There is an apparent contradiction between data comparing future stationary source emissions reported in the text on p. 4-10 and data from the GHG analysis results contained on Table 4-3. In addition to these discrepancies, Table 4.3 omits important data necessary to assess CO_2 impacts. These issues are described below.

Table 4.3, which compares Build with Improvements condition to the 2016 Build condition indicates a 963.7 tpy CO_2 reduction associated with the Project's 2016 Build with Improvements

condition. This is acceptable, however the text on p. 4-10 compares stationary source emissions of the 2016 Build with Improvements condition to the 2016 No Build condition and reports a 963.7 tpy CO_2 reduction associated with the Project. This is not possible because the GHG analysis did not analyze a 2016 No Build condition for stationary sources.

Table 4.3 also describes the 2006 Existing condition and the 2016 No Build condition emissions data as "N/A" or not applicable. MassDEP disagrees that these baseline conditions are not applicable. Without the 2016 No Build baseline information, it is not possible to compare the Project's actual CO_2 emission impacts.

Recommendations

The Draft MEPA GHG Policy seeks reasonably accurate quantitative analysis of CO_2 emissions from applicable projects. The policy then directs project proponents to complete GHG analyses to evaluate alternatives that avoid, minimize, and mitigate CO_2 impacts and ensure that project proponents have taken all feasible means and measures to reduce those impacts. The Policy is not intended to create a numeric emission target.

Despite a reasonable effort to reduce mobile sources GHG emissions, the Project still results in an increase in CO_2 emissions of 22,572 tpy when compared with the 2016 No Build condition. As discussed in the summary of the VOC and NOX analysis above, MassDEP recommends that additional TDM measures be implemented to further reduce mobile source CO_2 emissions. MassDEP also recommends consideration of additional sustainable design principles such as those suggested by Draft MEPA's GHG Policy. Regardless of the presumed benefits of sustainable design principals proposed as mitigation of direct stationary sources, the GHG analysis does not provide any baseline information of Existing or future No Build conditions. As stated above, without the 2016 No Build baseline information, it is not possible to compare the project's actual CO_2 emission impacts. MassDEP believes this baseline information is relevant and recommends the proponent provide this No Build baseline information. Once this additional information is provided, the proponent should consider additional measures that could avoid, mitigate, or offset the difference in the two scenarios.

MassDEP recommends that all air quality mitigation commitments identified in the DEIR and those additionally recommended by MassDEP shall be incorporated into Section 61 Findings in the FEIR.

Finally, absent any information relative to indirect or off-site CO_2 emissions, the proponent should consider offset measures such as a commitment to support state or municipal climate action activities or other offset measures described in the Draft MEPA GHG Policy and Protocol to address off-site CO_2 reduction measures. The FEIR should explore further these and other additional opportunities to avoid, minimize, or mitigate *indirect* impacts including a commitment to purchasing electricity generated from renewable energy sources or generating renewable energy on-site.

Massachusetts Contingency Plan (MCP) /21E

Several of the listed MCP sites within the Northwest Park Redevelopment have Response Action Outcomes (RAO). In Section 8, (page 8-10) the DEIR indicates that some remedial

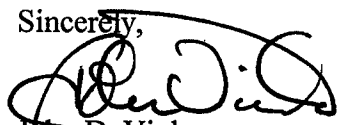
systems that are currently in place and operated will require removal, relocation, and/or replacement during future redevelopment. As such, construction in areas with a RAO must follow the provisions of 310 CMR 40.1067, which applies to remedial actions conducted at a disposal site after a Response Action Outcome Statement has been submitted to MassDEP. Furthermore, significant changes and/or modifications to on-going Comprehensive Remedial Actions may require a modified Remedial Action Plan. All work conducted must meet the Response Action Performance Standards and comply with all applicable requirements set forth in 310 CMR 40.0000. A comprehensive groundwater monitoring plan, capable of monitoring contaminant concentrations in overburden, shallow bedrock, and deep bedrock groundwater will be necessary during construction and blasting activities at the Northwest Park. Appropriate actions must be taken to address substantial changes in contaminant concentrations at these locations.

Recycling Issues

The Department appreciates the proponent's commitments to recycle and reuse demolition materials such as pavement and concrete. However, the DEIR did not make any commitments to recycling of solid waste at full build. Therefore, MassDEP again requests that this issue be considered in the EIR. As mentioned in the previous MassDEP ENF comment, waste reduction and recycling and the use of recycled materials in the project are necessary to minimize or mitigate the long-term solid waste impacts of this major development. The Commonwealth's waste diversion strategy is part of an integrated solid waste management plan, contained in The Solid Waste Master Plan that places a priority on source reduction and recycling. Efforts to reduce waste generation and promote recycling have yielded significant environmental and economic benefits to Massachusetts' residents, businesses and municipal governments over the last ten years. Waste diversion will become even more important in the future as the key means to conserve the state's declining supply of disposal capacity and stabilize waste disposal costs. The proponent is reminded that the solid waste, waste disposal ban regulations in 310 CMR 19.017 prohibit disposal of certain materials including recyclable paper, which will be a significant portion of the waste stream for future retail uses at the project site. Additional information is available on the following MassDEP website: http://www.mass.gov/dep/recycle/laws/bansreg.htm.

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Jack Zajac at (978) 694-3240 for further information on the wastewater issues, Rachel Freed at (978) 694-3258 for wetlands issues, and Leticia Ruiz-Boyle at (978) 694-3352 regarding the MCP. Should you have any questions on air quality issues, please contact Jerome Grafe at (617) 292-5708. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338.

Sincerely,



John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Jerome Grafe, MassDEP-Boston
Eric Worrall, Stephen Johnson, Kevin Brander, Rachel Freed, James Persky, Joanne Fagan, Jill Provencal, Jack Zajac, Leticia Ruiz-Boyle, MassDEP-NERO
Town of Burlington, Planning Board, Conservation Commission

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION

EOT

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

BERNARD COHEN
SECRETARY

October 10, 2007

Ian A. Bowles, Secretary
Executive Office of Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RE: Burlington – Northwest Wood - DEIR
(EOEA #14000)

ATTN: MEPA Unit
William Gage

Dear Secretary Bowles:

On behalf of the Executive Office of Transportation, I am submitting comments regarding the proposed Northwest Woods project in Burlington, as prepared by the Office of Transportation Planning. If you have any questions regarding these comments, please call J. Lionel Lucien, P.E., Manager of the Public/Private Development Unit, at (617) 973-7341.

Sincerely,

David J. Mohler,
Acting Deputy Secretary for Planning

DJM/jll

TEN PARK PLAZA, BOSTON, MA 02116-3969
TELEPHONE: (617) 973-7000 • TELEFAX: (617) 523-6454 • TDD: (617) 973-7306 • WWW.MASS.GOV/EOT

cc: Luisa Paiewonsky, Commissioner
David Anderson, P.E., Acting Chief Engineer
Patricia Leavenworth, P.E., District 4 Highway Director
Neil Boudreau, State Traffic Engineer
PPDU files
MPO Activities files
Planning Department, Town of Burlington
Metropolitan Area Planning Council
Boston Region Metropolitan Planning Organization

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION AND PUBLIC WORKS
OFFICE OF TRANSPORTATION PLANNING

MEMORANDUM

TO: David J. Mohler, Acting Deputy Secretary for Planning
Executive Office of Transportation and Public Works

FROM: J. Lionel Lucien, P.E., Manager
Public/Private Development Unit

DATE: October 10, 2007

RE: Burlington– Northwest Park - DEIR
(EOEA #14000)

The Public/Private Development Unit has reviewed the Draft Environmental Impact Report (DEIR) for the proposed Northwest Park mixed-use project in Burlington. The proposed project entails the redevelopment of the existing Northwest Park office complex into a 3.28 million square foot mixed-use development that will consist of retail, office, and multi-family housing components, an increase of 1.34 million square feet of building space. The 127-acre site is located along Middlesex Turnpike, north of the I-95/Route 3/Middlesex Turnpike interchange in Burlington. Based on information provided in the DEIR, the project is expected to generate approximately 25,940 additional vehicle trips on an average weekday, for a total of 35,720 vehicle trips and will provide approximately 7,210 parking spaces. The project categorically requires the preparation of an Environmental Impact Report (EIR), and a MassHighway permit is required for indirect access to Route 3.

The DEIR included a transportation study that generally conforms to the EOEEA/EOTPW Guidelines for EIR/EIS Traffic Impact Assessments. However, we have a number of issues and concerns regarding this project that should be addressed in the FEIR.

The project proponent has indicated that the development program is likely to extend beyond a five-year period, and studied the traffic impacts of the project over a ten-year horizon. While generally most development's traffic impacts are evaluated over five years, a project of this size may require more time to reach full occupancy; therefore, we concur that the 10-year horizon would be more reflective of the impacts of this project on the state roadway system.

The information provided in the DEIR proposes an adjustment in the number of vehicle trips generated by the project due to the mixed-use nature of the site. Based on ITE Trip credit calculations and additional documentation provided in the DEIR, the mixed-use nature of the office, residential, and retail components of the site would likely impact the internal trips and result in

enough captured trips to justify the adjustment. Therefore, we concur with the methodology used and the proponent's assumption for the internal trip credit.

The project proponent has identified a series of mitigation measures based on the proposed development. Specific improvements that the proponent has committed to undertake include roadway improvements at each of the site driveway intersections with Middlesex Turnpike, as well as off-site improvements at the following state highway locations: the Route 62/Route 3 southbound ramps intersection, the Route 62/Route 3 northbound ramps/Crosby Drive intersection, the Middlesex Turnpike/Route 128/I-95 southbound ramps intersection, the Middlesex Turnpike/Route 128/I95 northbound ramp/Wheeler Road intersection, and the Route 3/Route 128/I-95 interchange.

We have reviewed the DEIR and remained concerned that several locations identified in the traffic study would continue to operate at unacceptable conditions with the proposed mitigation measures in place. In particular several weave, merge and diverge movements at the I-95 (Route 128)/Route 3 interchange are projected to operate at LOS F in the 2016 Build conditions. While we recognize that the deficiencies at the interchange can be attributed to pre-existing conditions, the two minor improvements that the proponent has committed to construct may not provide the relief to adequately accommodate the additional traffic associated with the Northwest Woods Development. The project proponent should continue discussions with MassHighway to identify effective and feasible mitigation measures that could be jointly implemented to improve traffic conditions.

The project proponent has also proposed in the DEIR a phased implementation of the mitigation measures at the Route 128/I-95/Middlesex Turnpike interchange. The mitigation measures include roadway widening along Middlesex Turnpike, geometric improvements and traffic signal phasing and timing at the ramp intersections, and queue detection on the ramps. We generally agree that the proposed improvements would improve existing conditions and mitigate the impacts of the project. The proponent has also committed to funding a pro-rata, fair-share contribution towards the construction of these improvements and to work with other state agencies, the Town of Burlington, and other private developers to fund the overall project; however EOTPW and Mass Highway do not currently have a mechanism to receive fair share contributions toward highway improvements. The proponent need to further discuss with EOT/MassHighway and include in the FEIR the scheduling and phasing of these improvements. While we prefer that the construction of the improvements at the I-95 northbound and southbound ramps at Middlesex Turnpike be implemented at the same time to avoid construction delays at this heavily traveled interchange, we would continue discussions on the phased implementation and on ways to minimize is construction related impacts on the state highway system. We recommend that a phased approach to the mitigation commensurate with the level of development on the site be included in the FEIR with appropriate traffic analysis in order to gage the level of development that could occur prior to the implementation of the identified mitigation package.

The FEIR identified a number of Transportation Demand Management (TDM) strategies aimed at reducing vehicle trips to the site and encouraging pedestrian and bicycle travel. Specific TDM measures to be implemented by the project proponent include: designation of an on-site transportation coordinator, specific incentives geared towards office, retail, and residential commuters, site public transportation, and on-site bicycle racks. The project proponent should continue discussions with the MBTA and the Burlington B Line to identify a location for the bus

stop on the site and potential amenities. We encourage the project proponent to work the Route 128 Business Council and the Lahey Clinic Hospital in their existing TDM measures in the vicinity of the project.

The FEIR should provide an update of the local permitting processes for the proposed project, particularly with respect to any state highway issues being discussed. We strongly encourage proponents to consult with MassHighway before any state highway issues are discussed in local meetings or hearings.

The project proponent should meet with PPDU Unit and appropriate MassHighway Units to address the above comments. If you have any questions regarding these comments, please contact Erin Kinahan of the Public/Private Development Unit at (617) 973-8059.

BG

Metropolitan Area Planning Council

60 Temple Place, Boston, Massachusetts 02111 617-451-2770 fax 617-482-7185 www.mapc.org

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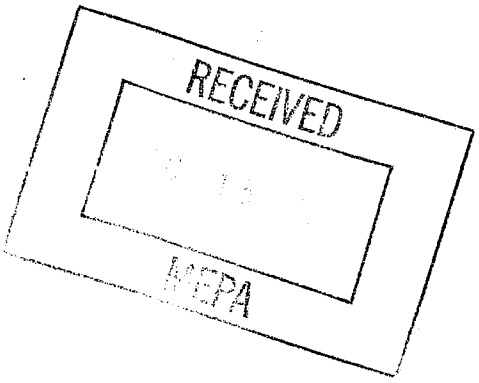


October 11, 2007

Ian Bowles, Secretary
Executive Office of Energy and Environmental Affairs
Attention: MEPA Office
William Gage, MEPA # 14000
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: Northwest Park Redevelopment, Burlington, EOEA # 14000, DEIR

Dear Secretary Bowles:

The Metropolitan Area Planning Council (MAPC) regularly reviews proposals deemed to have regional impacts. The Council reviews projects for consistency with *MetroPlan*, the regional policy plan for the Boston metropolitan area, and MAPC's Smart Growth Principles, as well as for their impacts upon the environment. MAPC has reviewed the Draft Environmental Impact Report (DEIR) and offers the following comments.

Project description

The site has access off Middlesex Turnpike and Second Avenue, and its 127 acres are currently developed as 1.34 million square feet of office space with a few commercial uses. The redevelopment plan proposes replacing these uses with 1.9 million square feet of new office, plus 1.3 million square feet of mixed use development, including up to 300 new residential units, in two phases. New internal local streets will be created as part of the circulation plan, and there are proposed to be 8,700 parking spaces (surface and structured) at buildout (a net increase of 3,870 new spaces). The redevelopment will result in 28 acres of new open space.

Transportation

MAPC is supportive of this project. It is consistent with the principles of the regional development plan, *MetroPlan,* and the forthcoming MetroFuture. We support the proposed redevelopment of an already developed area that is currently served by existing infrastructure and nine bus lines. The proposal includes a mix of uses that will help reduce single occupancy vehicle trips. These trips will be further reduced by the proposed Transportation Demand Management (TDM) program and pedestrian and bicycle accommodations, as well as improved bus facilities.

We recommend that the proponent take the following steps to further reduce single occupancy vehicle trips, to create a more pedestrian friendly environment, and to reduce impervious services on the site:

- The site design should be adapted to better mix the proposed land uses – a mix of uses within the site will allow office workers to conduct errands and go to lunch on foot. Land uses within the site are currently too segregated and isolated by parking lots.

- The large parking lots on the northwestern portion of the site (office) should be broken up. These large lots discourage pedestrian access and provide large swaths of impervious service. This configuration also limits the use of Low Impact Development techniques such as bioretention cells to reduce runoff.

- We are concerned that 12,040 parking spaces will far exceed the proposed land use demand. The proponent's parking demand calculation far exceeds the Institute for Transportation Engineering recommendations (ITE identifies 3 spaces per 1,000 square feet of office floor space instead of the 4.5 used in the DEIR, and 4 spaces per 1,000 square feet of retail instead of 6). A reduced number of parking spaces would improve the connectivity of the site, reduce impervious surfaces, and allow space for LID measures. MAPC requests a decreased number of parking spaces at least to meet ITE standards; failing that, detailed reasons for the necessity of providing such a large number of parking spaces should be provided in the FEIR.

- Permeable surfaces should be used for parking spaces that are least desirable. These spaces will only be used when the lot is at maximum capacity and will suffer less wear. Permeable parking surfaces will reduce runoff in the area.

The proposed developments will have transportation impacts in the adjoining communities of Lexington and Bedford. We suggest that the proponent notify and consult with officials from these effected communities and include them in the project distribution list.

Thank you for the opportunity to comment on this project.

Sincerely,

Marc D. Draisen
Executive Director

cc: Tony Fields, MAPC Representative, Burlington
Gordon Feltman, MAPC Representative, Bedford
Richard Canale, MAPC Representative, Lexington

Northwest Park 14000 DEIR

4

Air Quality

Introduction

This chapter presents a summary of the air quality study conducted for the Project, which, in accordance with the Secretary's Scope and MEPA regulations, includes an ozone mesoscale analysis and an assessment of greenhouse gas (GHG) emissions.

The ozone mesoscale analysis demonstrates that the Project meets the DEP air quality criteria. With the recommended physical transportation mitigation measures, the VOC and NOx emissions are estimated to be reduced from the 2016 Build condition. Additionally, the proposed Transportation Demand Management (TDM) program measures are expected to reduce the VOC and NOx emissions associated with the Project, therefore, demonstrating compliance with the transportation conformity criteria.

The GHG emissions analysis demonstrates that the Project meets the Executive Office of Energy and Environmental Affairs (EEA) draft policy on GHG emissions. The Project will include mobile and stationary source mitigation measures that will result in reduced GHG emissions for the 2016 Build with Improvements condition.

Ozone Mesoscale Analysis

The Massachusetts Department of Environmental Protection (DEP) has established guidelines that define the modeling and review criteria for air quality studies prepared pursuant to review under the MEPA. These guidelines require that mesoscale analyses be prepared for proposed development projects to determine the change in project-related ozone precursor emissions. The predominant source of ozone precursor emissions anticipated from the Project is emissions from Project-related traffic. Ozone is not directly emitted by motor vehicles, but is generated when volatile organic compounds (VOC) and oxides of nitrogen (NOx) emissions from motor vehicles, stationary sources, and area sources react in the atmosphere with sunlight and heat.

Project-related ozone impacts are determined by assessing the changes in VOC and NOx emissions of motor vehicles. The DEP criteria require that proposed development projects include all reasonable and feasible emission reduction

mitigation measures if the emissions from the Build Condition are greater than No-Build Condition. Massachusetts has incorporated this criterion into the State Implementation Plan (SIP).

■

Mesoscale Analysis Modeling Methodology

The purpose of the mesoscale analysis is to estimate the area wide emissions of V and NOx during a typical day in the peak ozone season (summer) consistent with requirements of the SIP. The mesoscale analysis evaluates the change in VOC and NOx emissions from the average daily traffic volumes, roadway lengths, and vehi emission rates of existing and future (No-Build and Build) conditions. To demonstrate compliance with the SIP criteria, the air quality study must show the Project's change in daily (24-hour period) VOC and NOx emissions.

Using EPA-recommended air quality modeling techniques, total pollutant emission were calculated for the Project under the four conditions: the 2006 Existing; the 2016 No-Build; and the 2016 Build Conditions. The roadways included in the mesoscale study area are depicted in Figure 4.1. The mesoscale study area includes, at a minimum, all the roadway links and intersections that are projected to experience an increase of ten percent in traffic due to the Project and that experience Level-of-Service (LOS) designation of D or lower under existing or future conditions. The specific roadways included Middlesex Turnpike, Burlington Mall Road, and Route 62.

The traffic and emissions data are incorporated into the DEP and the U.S. Environmental Protection Agency (EPA) air quality models and modeling procedures to generate emissions estimates that demonstrate whether the Project will have air quality impacts. As mentioned above, the air quality study evaluated four conditions:

- The 2006 Existing Condition represents current traffic conditions in the study area and assumes no vehicle trips to the Project Site;
- The 2016 No-Build Condition reflects existing traffic volumes increased to account for anticipated background traffic volume growth, and includes traffic related to specific development projects within the study area that are expected to be completed by 2016, and assumes no Project-related vehicle trips;
- The 2016 Build Condition reflects the 2016 No-Build Condition traffic volumes plus Project-related vehicle trips; and
- The 2016 Build with Mitigation Condition reflects the 2016 Build Condition plus the proposed mitigation measures (such as intersection signalization) described later in this chapter.

The mesoscale analysis calculated the changes in VOC and NOx emissions for the existing and future conditions within the study area. The year 2016 was selected as

the future year of analysis because the MEPA Policy requires that a project look five years into the future from the current year of analysis. The mesoscale analysis traffic (volumes, delays, and speeds) and emission factor data were developed for the four conditions. These data were incorporated into air quality models to demonstrate whether or not the Project will meet the Clean Air Act Amendments (CAAA) and SIP criteria.

Emission Rates

The vehicle emission factors used in the mesoscale analysis were obtained using the EPA's MOBILE6.2[1] emissions model. MOBILE6.2 calculates emission factors from motor vehicles in grams per vehicle-mile for existing and future conditions. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts-specific conditions such as the vehicle age distribution, the statewide Inspection and Maintenance (I/M) Program, and the Stage II Vapor Recovery System[2]. Emission factors for the mesoscale analysis were determined using the DEP-recommended temperatures for the summer (ozone) season. A detailed presentation of the MOBILE6.2 input and output data are presented in Appendix C.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mesoscale analysis uses typical daily peak and off-peak traffic volumes for the ozone season (summer). Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The detailed traffic analysis and traffic data used in the air quality study are presented in Chapter 3, *Transportation* and Appendix B of this Draft EIR, respectively.

■

Existing Air Quality Conditions

The 1990 CAAA divided states into attainment and non-attainment areas with classifications based upon the severity of the air quality problem. Massachusetts has been determined to be a non-attainment area, statewide, for ozone. The State has been divided into two non-attainment areas, Eastern and Western Massachusetts. On June 15, 2005, the EPA revoked the 1-hour ozone standard for most areas in the country. This action means that the 1-hour ozone non-attainment area classified as "Serious," is no longer applicable for Eastern Massachusetts. Only the 8-hour ozone National Ambient Air Quality Standard (NAAQS) applies. The Project is located in the Eastern Massachusetts 8-hour ozone non-attainment area, which has been classified as "Moderate."

▼

1 MOBILE6.2 (Mobile Source Emission Factor Model), The May 2004 release from US EPA, Office of Mobile Sources, Ann Arbor, MI.

2 The Stage II Vapor Recovery System is the process of collecting gasoline vapors from vehicles as they are refueled. This requires the use of a special gasoline nozzle at the fuel pump.

Existing Mesoscale Emissions

The mesoscale analysis calculated the 2006 VOC and NOx emissions from the major roadways in the study area. These emissions, estimated to be 1,783.4 kilograms per day (kg/day) of VOCs, and 5,726.9 kg/day of NOx, establish a baseline to which future emissions can be compared. Table 4-1 below summarizes the mesoscale analysis results for existing conditions.

Mesoscale Analysis Findings

Future Project-related emission calculations are based upon changes in traffic and emission factor data. The traffic data include traffic volumes, vehicle-miles-of-travel, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The following section reports the findings of the mesoscale analysis for the Project.

The mesoscale analysis estimated the future study area VOC and NOx emissions due to the changes in traffic and emission data. Under the 2016 No-Build Condition, VOC emissions were estimated to be 831.3 kg/day, and NOx emissions were estimated to be 1,722.8 kg/day. The future No-Build Condition VOC and NOx emissions are lower than the 2006 Existing Conditions emissions due to the implementation of emission control programs, such as the Federal Motor Vehicle Emission Control Program, the Stage II Vapor Recovery System, and the Massachusetts Vehicle Inspection and Maintenance program.

Under the 2016 Build Condition, the VOC emissions were estimated to be 864.2 kg/day and the NOx emissions were estimated to be 1,766.7 kg/day. This results in an increase of 32.9 kg/day in VOC emissions and an increase of 42.9 kg/day in NOx emissions from the 2016 No-Build Condition. Table 4-1 presents the mesoscale analysis results for all conditions, including future conditions.

Table 4-1
Mesoscale Analysis Results*

Pollutant	2006 Existing Condition	2016 No-Build Condition	2016 Build Condition	Build / No-Build Difference
Volatile Organic Compounds	1,783.4	831.3	864.2	32.9
Oxides of Nitrogen	5,726.9	1,722.8	1,766.7	42.9

*Kilograms Per Day

Proposed Air Quality Mitigation

The DEP criteria requires that the Project incorporate air quality mitigation measures because the 2016 Build Condition VOC and NOx emissions are greater than the 2016 No-Build Condition VOC and NOx emissions. The Project will incorporate traffic signal installation, roadway widening/reconfiguration, and traffic control improvements. The mesoscale analysis calculates the emission reductions from the improved traffic flow from the mitigation improvements. Table 4-2 below summarizes the emission reductions under all conditions.

Table 4-2
Mesoscale Analysis Results with Mitigation Condition*

Pollutant	2006 Existing Condition	2016 No-Build Condition	2016 Build Condition	2016 Build w/ Mitigation Condition	Build with Mitigation/ Build Difference
Volatile Organic Compounds (VOCs)	1,783.4	831.3	864.2	859.2	5.0
Oxides of Nitrogen (NOx)	5,726.9	1,722.8	1,766.7	1,764.6	2.1

*Kilograms Per Day

The results of the mesoscale analysis demonstrate that the roadway improvements (described in detail in Chapter 3, *Transportation* of this Draft EIR) will meet the transportation conformity criteria by reducing both VOC and NOx emissions. The mitigation measures result in improved geometry and operation in the study area. As mentioned above, the VOC and NOx emissions for the 2016 Build with Mitigation Condition were calculated to be 859.2 kg/day and 1,764.6 kg/day, respectively. The mitigation measures would result in a 5.0 kg/day VOC emissions reduction and a 2.1 kg/day NOx emissions reduction from the 2016 Build condition.

Transportation Demand Management Measures

As described in Chapter 3, *Transportation*, the Proponent will also implement a TDM program as part of the Project in order to reduce Project-generated vehicle trips and to minimize peak-period traffic demands in the study area. While the mesoscale analysis does not quantify the emission reductions from proposed TDM mitigation measures, their implementation is expected to result in additional improvements to air quality in the study area.

The implementation of the TDM program is expected to improve air quality in the study area by promoting the use of alternative forms of transportation to the use of single-occupant motor vehicle as the principal travel mode to and from the Project site. The Proponent will investigate to develop related marketing materials, develop and implement appropriate TDM measures and monitor the effectiveness of those measures for the proposed office, retail and residential developments. Chapter 3, *Transportation* outlines the specific elements of the TDM programs. In general this program includes a TDM Coordinator, on-site commuter information, bicycle and pedestrian facilities, and promoting alternative transportation to the development.

In addition to the general TDM measures the following specific measures have been suggested for the office and retail portions of this development. The office TDM measures are as follows:

- Provide flexible hours so that employees have the option of commuting outside the peak traffic periods. Similar benefits can also be realized through staggered work hours so that employee trips occur over a broader period and thereby reduce peak hour demands.
- Massachusetts' employees have the ability to use pre-tax dollars for the purchase of MBTA passes. The pre-tax purchase is free from both federal and state income and payroll taxes.
- Consider telecommuting options.
- Hold promotional events for bikers and walkers.
- Provide incentives for bicycle and HOV commuting.
- Prioritize local hiring.
- Offer direct deposit to employees.
- Provide a guaranteed ride home program to eliminate an often-cited deterrent to carpool and vanpool participation.
- Sponsor vanpools and subsidize expenses.
- Provide preferential carpool and vanpool parking within the parking garages and spaces near office building entrances as a convenience to participants and to promote ridesharing.
- Provide subsidies to employees who purchase monthly or multiple trip transit passes.

The retail TDM measures are as follows:

- Hold promotional events for bikers and walkers.
- Provide incentives for bicycle and HOV commuting.
- Prioritize local hiring.
- Offer direct deposit to employees.
- Provide subsidies to employees who purchase monthly or multiple trip transit passes.

Several of the TDM measures to be implemented for the entire site should also be attractive to residents at Northwest Park. In addition to those measures described for use in the Office TDM program, residential TDM measure is as follows:

- Work with a car sharing service (such as Zipcar®) to provide cars for periodic use by residents.
- Provide bicycle racks and pedestrian walkways,
- The proximity to public transportation will also help to reduce vehicle trips.

Greenhouse Gas Emissions Analysis

On July 11, 2007, the Executive Office of Energy and Environmental Affairs (EEA) issued for public comment a draft policy that requires project proponents to implement feasible measures to minimize GHG emissions. This policy requires that projects undergoing review by the MEPA Office at the EIR level and meeting specific criteria (e.g., generation of 3,000 or more vehicle trips per day) quantify the project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying project-related GHG emissions, the policy also requires proponents to quantify the impact of proposed mitigation in terms of emissions and energy savings. The goal of this policy is to identify measures to reduce or minimize the GHG emissions.

Greenhouse Gas Analysis Methodology

The purpose of the analysis is to calculate the GHG emissions from mobile sources and both direct and indirect stationary sources related to the Project. While GHG emissions include several gases, CO2 was selected for evaluation because it is the most significant component of Project-related GHG emissions.

The air quality study calculated GHG emissions from mobile and stationary sources for four conditions: the 2006 Existing; the 2016 No Build; the 2016 Build; and the 2016 Build with improvements conditions. The mobile source emissions were calculated by performing a yearly mesoscale analysis to evaluate the changes in CO2 emissions for the existing and future conditions within the study area. Similar to the

mesoscale analysis for ozone, the year 2016 was selected as the future year of analysis because MEPA's policy requires that a project look five years into the future from the current year of analysis. The mesoscale analysis traffic (volumes, delays, and speeds) and emission factor data were developed.. In addition to mobile sources, direct and indirect CO2 emissions from the Project's proposed building sources were calculated using the computer-based EQUEST model[3]. Direct emissions included those emissions from the facility itself such as boilers, heaters, and internal combustion engines. Indirect emissions included CO2 emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Total CO2 emissions were determined by combining the CO2 results from the mesoscale analysis with the CO2 emissions from the proposed direct and indirect building sources.

Mobile Source Analysis

The GHG mobile source analysis was conducted following procedures similar to the ozone mesoscale analysis. The mesoscale analysis estimated the area wide CO2 emissions from vehicle traffic for a time period of one year. The change in CO2 emissions from traffic were based on the average yearly traffic volumes, roadway lengths and vehicle emissions factors for existing and new trips for weekday and weekend conditions.

Mobile Source Emission Rates

Currently MOBILE6.2 has a simple estimate of CO2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts-specific conditions. A detailed presentation of the MOBILE6.2 input and output data are presented in Appendix C.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mesoscale analysis for CO2 emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The detailed traffic analysis and traffic data used in the air quality study are presented in Chapter 3, *Transportation* and Appendix B of this Draft EIR, respectively

3 EQUEST (the Quick Energy Simulation Tool), version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA

Stationary Source Analysis

The Project will generate GHG emissions thru the use of electricity and fossil fuels. The stationary source analysis calculated Project-related CO2 emissions from these building sources using the computer-based EQUEST model. These building sources included boilers, heaters and internal combustion engines. While the Project in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. The stationary source analysis calculated GHG emissions for two conditions, the 2016 Build, the 2016 Build with improvements. The 2016 Build condition represents the stationary source emissions that would occur if the Project were to be built using typical construction materials and rooftop equipment. The 2016 Build with improvements condition represents the Project emissions based upon the use of improved building materials and rooftop equipment.

Existing GHG Emissions Conditions

EPA has not set NAAQS for greenhouse gases, however, they do encourage strategies to reduce emissions and save fuel. EEA and MEPA's draft GHG emissions policy calls for proposed projects to reduce, minimize, or mitigate these emissions. The calculation of 2006 Existing condition emissions provides a base for which future years can be evaluated.

Existing Mobile Source Emissions

The GHG analysis calculated the 2006 CO2 emissions from the major roadways in the study area. These emissions, estimated to be 743,078.3 tons/year, establish a baseline to which future emissions can be compared. Table 4-3 presents the existing CO2 analysis results for existing conditions.

Existing Stationary Source Emissions

The Project will not exist under existing conditions and therefore no direct and indirect CO2 emissions from stationary sources would be generated.

Greenhouse Gas Emissions Analysis Findings

Future Project-related emission calculations are based upon changes in traffic and emission factor data as well as the Project's building sources. The traffic data include traffic volumes, vehicle-miles-of-travel, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The Project's building sources included direct

emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following sections present the findings of the GHG mobile and stationary source analyses for the Project.

Future Mobile Source Emissions

The GHG analysis estimated the future study area CO2 emissions due to the changes in traffic and emission data. Under the 2016 No-Build Condition CO2 emissions were estimated to be 859,805.1 tons per year.

Under the 2016 Build Condition, the CO2 emissions were estimated to be 882,728.2 tons per year. Under the 2016 Build Condition with improvements, the CO2 emissions were estimated to be 882,376.8 tons per year. This results in a decrease of 18,937.2 tons per year in CO2 emissions as compared to the 2016 No-Build Condition. This reduction is due to the geometric and operational improvements of the study area roadways. Table 4-3 presents the GHG analysis results for all conditions.

Future Stationary Source Emissions

The stationary source analysis calculated 2016 Build and 2016 Build with improvements CO2 emissions for direct and indirect emissions from stationary sources. Direct emissions included those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions included those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Under the 2016 Build Condition, the CO2 emissions were estimated to be 20,887.7 tons per year. Under the 2016 Build Condition with improvements, the CO2 emissions were estimated to be 19,924.1 tons per year. This results in a decrease of 963.7 tons per year in CO2 emissions as compared to the 2016 No-Build Condition. This reduction is due to the building mitigation measures discussed below. .

Table 4-3 presents CO2 emissions from mobile and direct and indirect stationary sources under all conditions, including improved conditions.

Table 4-3
CO2 Analysis Results with Mitigation Condition*

GHG Analysis	2006 Existing Condition	2016 No-Build Condition	2016 Build Condition	2016 Build w/ Improvements Condition	2016 Build with Improvements/ Build Difference
Mobile Source Analysis	743,078.3	859,805.1	882,728.2	882,376.8	-351.4
Direct /Indirect Stationary Source	NA	NA	20,887.7	19,924.1	-963.7
Total	NA	NA	903,615.9	902,300.9	-1,315.1

*Tons per Year

Proposed Improvements

The EEA and MEPA draft GHG emissions policy encourages project proponents to identify and quantify measures that would reduce or minimize GHG emissions from mobile sources and direct and indirect stationary sources. The Proponent has developed physical and operational mitigation measures to be included in the Project. The following is a partial list of these mitigation measures. They include:

Mobile Sources

- TDM measures (described above in the Ozone mesoscale analysis section and more fully in Chapter 3, *Transportation*) are also expected to reduce GHG emissions related to Project-induced mobile sources.

Stationary Sources

As discussed in Chapter 1, *Project Description* sustainable design principles, including energy efficiency are proposed as part of the Project. The following strategies will be incorporated into the Project in efforts to reduce GHG emissions from Project-related stationary sources:

- Use high-albedo roofing materials
- Install high-efficiency HVAC systems
- Eliminate or reduce use of refrigerants in HVAC systems
- Reduce energy demand using peak shaving or load shifting strategies
- Maximize interior daylighting through floor plates, increased building perimeter and use of skylights and light wells
- Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance
- Incorporate super insulation to minimize heat loss
- Install energy efficient measure, such as motion sensors for lighting and building climate control

Conclusion

The air quality study demonstrates that the Project complies with the Clean Air A
Amendments (CAAA), the State Implementation Plan (SIP), and the Executive O
of Energy and Environmental Affairs (EEA) policy on Greenhouse Gas emissions.
The ozone mesoscale analysis demonstrates that the Project will result in an increa
of VOC and NOx emissions, as compared to the No-Build condition. Consistent w
the guidelines of the DEP, the Project will incorporate reasonable and feasible
mitigation measures to reduce VOC and NOx emissions. These mitigation measur
include roadway improvements, traffic signal improvements and a TDM program.
The implementation of these mitigation measures will help reduce the VOC and
NOx emissions associated with the Project. The GHG emissions analysis
demonstrates that the Project meets the EEA draft policy on GHG emissions becaus
it includes mobile and stationary source mitigation measures that will reduced the
GHG emissions. The air quality study demonstrates that the Project conforms to the
CAAA, the SIP, and EEA GHG policy because:

- It will implement reasonable and feasible emission reduction mitigation measures,
- No new violation of the NAAQS will be created;
- No increase in the frequency or severity of any existing violations will occur; and
- No delay in attainment of any NAAQS will result.

Mobile Source Results – CO2 Emissions

Northwest Park - Burlington, MA

Annual Total CO_2 Emissions Inventory in Tons per Year

Pollutant	2006 Existing Condition	2016 No-Build Alternative	2016 Build Alternative	2016 Build Alternative With Mitigation
Carbon Dioxide	743,078.3	859,805.1	882,728.2	882,376.8
Difference - Existing		116,726.8	139,649.9	139,298.5
Difference - No-Build			22,923.1	22,571.7

Northwest Park - Burlington, MA

Annual Weekend CO_2 Emissions Inventory in Tons per Year

Pollutant	2006 Existing Condition	2016 No-Build Alternative	2016 Build Alternative	2016 Build Alternative With Mitigation
Carbon Dioxide	205,767.5	237,446.5	243,034.2	243,167.6
Difference - Existing		31,679.0	37,266.7	37,400.1
Difference - No-Build			5,587.7	5,721.1

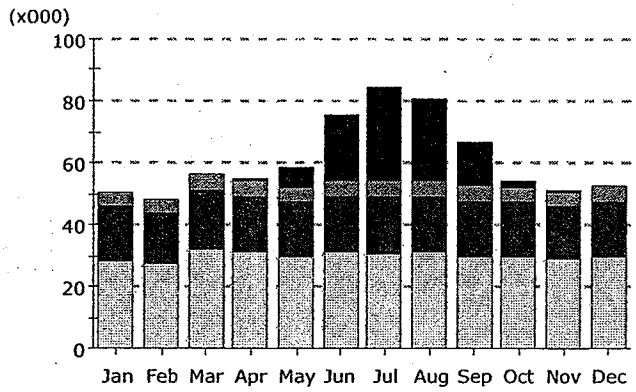
Northwest Park - Burlington, MA

Annual Weekday CO_2 Emissions Inventory in Tons per Year

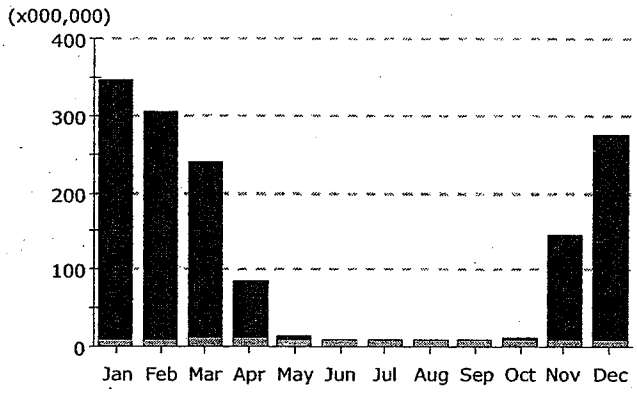
Pollutant	2006 Existing Condition	2016 No-Build Alternative	2016 Build Alternative	2016 Build Alternative With Mitigation
Carbon Dioxide	537,310.8	622,358.6	639,693.9	639,209.2
Difference - Existing		85,047.8	102,383.1	101,898.4
Difference - No-Build			17,335.3	16,850.6

Stationary Source Results – CO2 Emissions

Electric Consumption (kWh)



Gas Consumption (Btu)

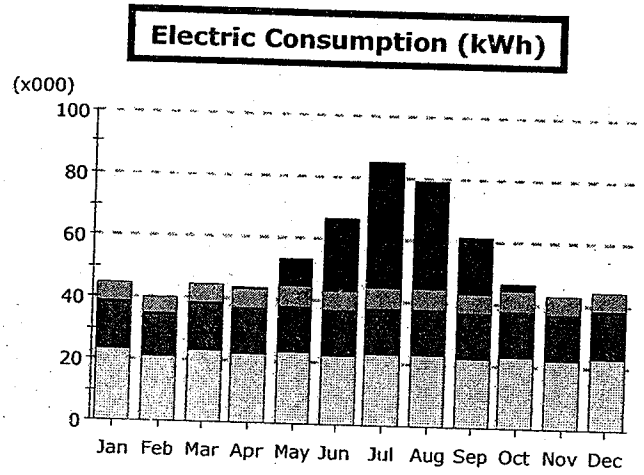


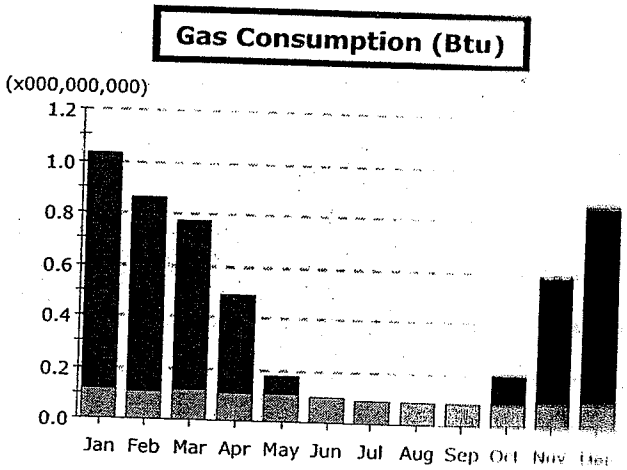
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.20	6.24	21.78	30.77	26.01	14.38	1.87	0.13	-	101.37
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.89	4.73	5.58	5.37	5.11	5.37	5.32	5.37	5.16	5.11	4.94	5.16	62.10
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	17.02	15.97	18.34	17.68	17.43	17.68	17.83	17.94	17.28	17.43	16.88	17.54	209.02
Task Lights	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	1.06
Area Lights	28.35	27.33	32.20	30.97	29.53	30.97	30.72	31.02	29.79	29.53	28.60	29.83	358.86
Total	50.53	48.27	56.40	54.46	58.42	75.89	84.73	80.43	66.70	54.08	50.78	52.78	733.48

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	337.2	295.8	229.1	74.5	3.8	-	-	-	-	3.7	135.8	266.2	1,346.1
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	9.7	9.6	11.2	10.6	9.5	9.2	8.6	8.3	8.0	8.3	8.5	9.5	111.1
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	347.0	305.4	240.3	85.1	13.4	9.2	8.6	8.3	8.0	12.0	144.3	275.7	1,457.2





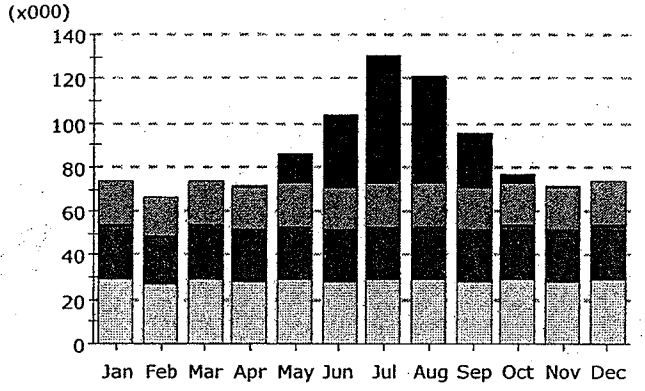
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.75	8.81	24.03	40.98	34.63	18.50	2.56	0.16	-	130.43
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	6.20	5.60	6.20	6.00	6.20	6.00	6.20	6.20	6.00	6.20	6.00	6.20	73.01
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	14.84	13.40	14.84	14.36	14.84	14.36	14.84	14.84	14.36	14.84	14.36	14.84	174.63
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	23.23	20.98	23.23	22.48	23.23	22.48	23.23	23.23	22.48	23.23	22.48	23.23	273.47
Total	44.44	40.15	44.44	43.73	53.10	66.86	85.24	78.89	61.34	46.88	43.14	44.43	653.66

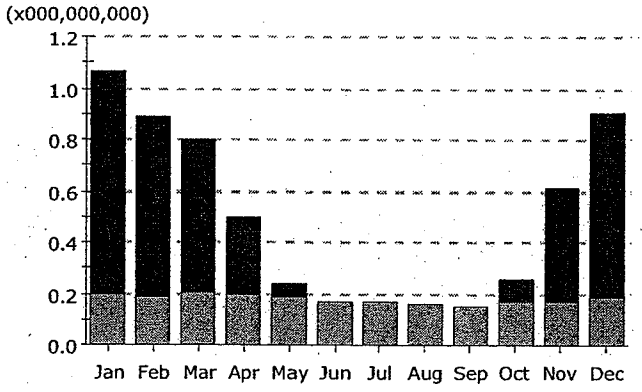
Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.92	0.76	0.66	0.38	0.07	0.00	0.00	0.00	0.00	0.12	0.49	0.76	4.16
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.11	0.10	0.12	0.11	0.11	0.10	0.09	0.09	0.09	0.09	0.10	0.11	1.21
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.03	0.87	0.77	0.49	0.18	0.10	0.09	0.09	0.09	0.21	0.59	0.87	5.37

Electric Consumption (kWh)



Gas Consumption (Btu)



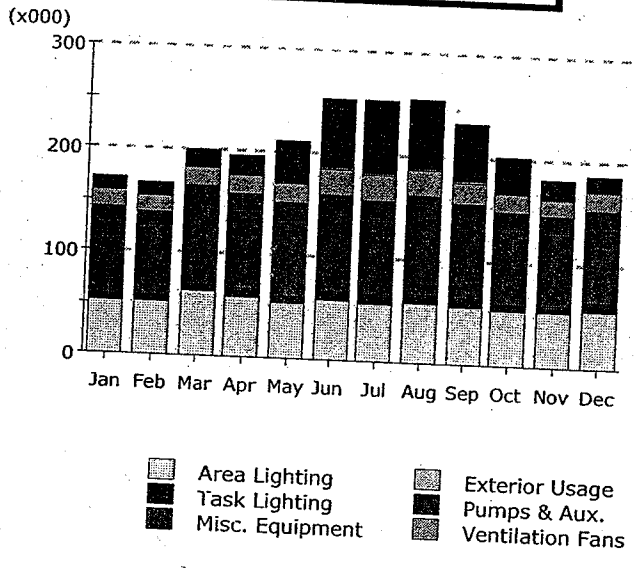
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.0	1.2	13.1	33.1	58.2	48.7	24.8	3.5	0.3	0.0	182.8
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	19.4	17.6	19.4	18.8	19.4	18.8	19.4	19.4	18.8	19.4	18.8	19.4	228.8
Pumps & Aux.	0.7	0.7	0.7	0.6	0.1	-	-	-	0.0	0.2	0.6	0.7	4.3
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	23.7	21.4	23.7	23.0	23.7	23.0	23.7	23.7	23.0	23.7	23.0	23.7	279.3
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	29.5	26.6	29.5	28.5	29.5	28.5	29.5	29.5	28.5	29.5	28.5	29.5	347.0
Total	73.3	66.3	73.3	72.0	85.9	103.4	130.8	121.4	95.1	76.3	71.1	73.3	1,042.2

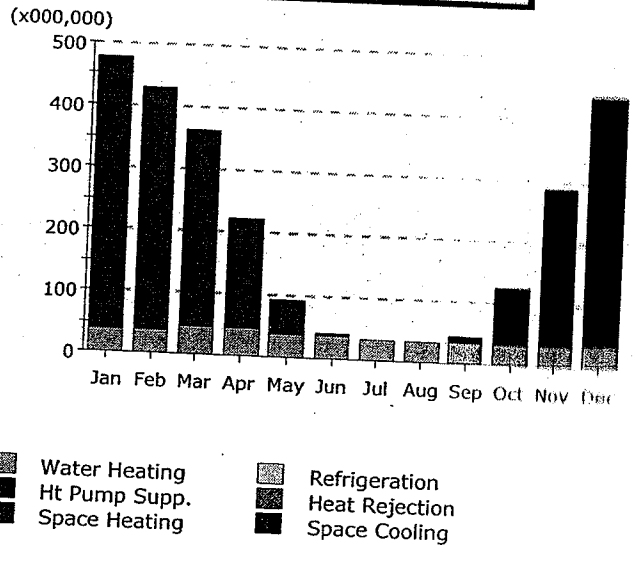
Gas Consumption (Btu x000,000,000)

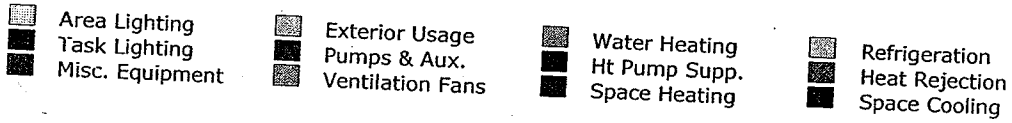
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.87	0.70	0.59	0.30	0.05	0.00	-	-	0.00	0.09	0.44	0.72	3.77
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.20	0.19	0.21	0.20	0.19	0.17	0.17	0.16	0.15	0.16	0.17	0.19	2.16
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.07	0.89	0.80	0.50	0.24	0.17	0.17	0.16	0.15	0.26	0.61	0.91	5.92

Electric Consumption (kWh)



Gas Consumption (Btu)





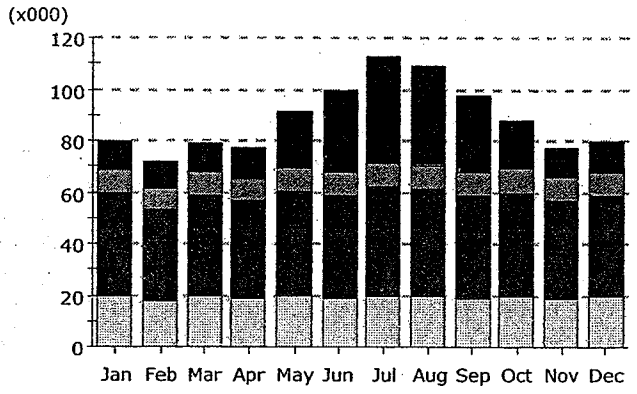
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	0.0	0.4	1.9	2.6	1.9	1.1	0.1	0.0	0.0	8.0
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	16.3	16.2	18.9	18.1	17.9	23.4	24.4	24.3	21.0	17.4	16.5	17.7	231.9	
Pumps & Aux.	13.2	13.2	16.1	16.0	16.9	19.1	18.2	19.1	18.2	16.2	14.6	14.9	195.8	
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	70.4	67.2	78.1	75.1	72.4	75.1	74.3	76.2	73.2	72.4	71.3	74.3	829.9	
Task Lights	6.6	6.6	8.0	7.6	6.9	7.6	7.3	7.6	7.3	6.9	6.9	7.3	86.6	
Area Lights	51.4	50.9	61.2	58.6	53.8	58.6	56.3	58.7	56.1	53.8	53.7	56.3	669.6	
Total	171.2	166.9	199.5	196.6	211.5	252.4	254.1	256.6	234.3	201.7	182.5	187.7	2,515.2	

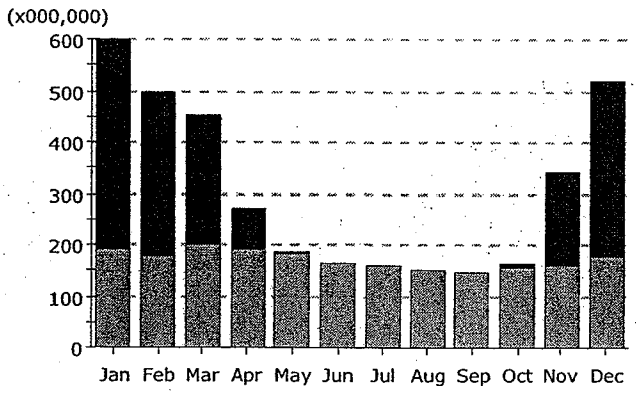
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	439.9	392.6	315.4	177.8	56.3	1.6	-	-	12.4	92.5	254.3	403.3	2,145.9
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	37.4	38.3	46.1	43.4	37.1	37.6	33.8	33.8	32.2	32.1	34.3	38.6	444.7
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	477.2	430.9	361.5	221.2	93.4	39.2	33.8	33.8	44.6	124.6	288.6	441.9	2,590.6

Electric Consumption (kWh)



Gas Consumption (Btu)

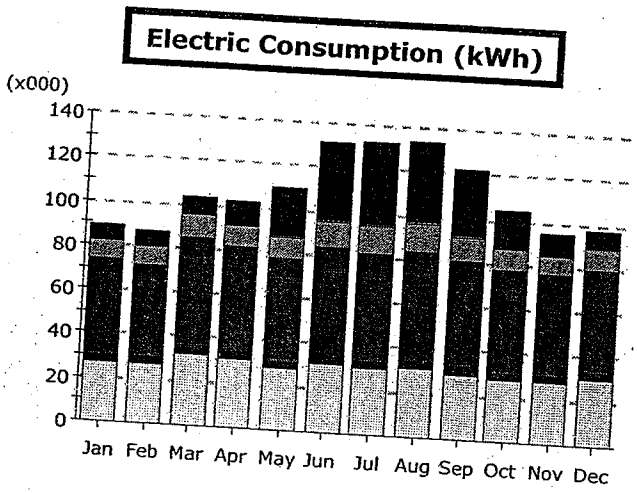


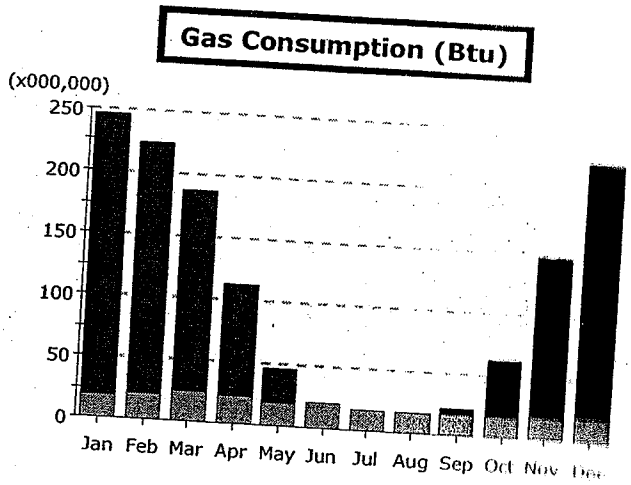
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	12.2	10.8	12.0	12.1	22.2	32.3	41.1	38.3	30.4	19.0	11.8	12.0	254.1
Heat Reject.	-	-	-	-	0.1	0.2	0.5	0.4	0.1	0.0	-	-	1.3
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	9.1	8.1	8.9	8.6	9.0	8.6	9.0	8.9	8.7	9.0	8.7	9.0	105.6
Pumps & Aux.	12.8	11.4	12.5	12.2	13.9	14.4	15.7	15.4	14.4	13.6	12.3	12.6	161.2
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	26.8	24.1	26.7	25.8	26.7	25.8	26.7	26.7	25.9	26.7	25.9	26.7	314.6
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	19.6	17.5	19.1	18.6	19.5	18.6	19.4	19.2	18.7	19.5	18.8	19.4	227.8
Total	80.4	72.0	79.2	77.2	91.4	99.9	112.5	109.0	98.1	87.9	77.4	79.7	1,064.6

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	410.1	320.7	251.1	80.4	5.5	-	-	-	-	6.3	181.1	339.6	1,594.9
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	189.0	179.2	202.0	192.1	181.6	166.5	159.6	152.7	147.0	156.7	162.0	179.8	2,068.3
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	599.1	500.0	453.2	272.5	187.1	166.5	159.6	152.7	147.0	163.0	343.1	519.5	3,663.2





Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

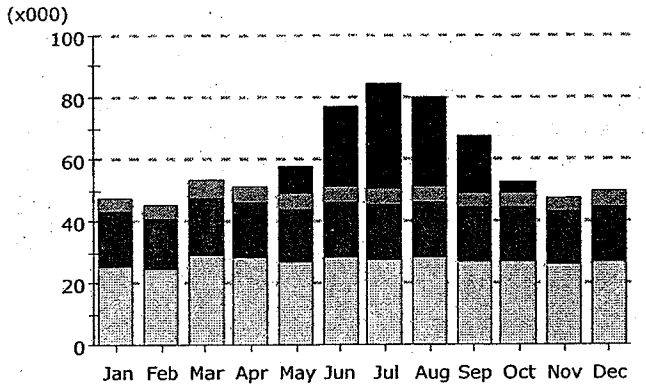
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.0	0.2	1.0	1.3	1.0	0.6	0.1	0.0	0.0	4.3
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	8.4	8.4	9.8	9.4	9.3	12.1	12.7	12.6	10.9	9.0	8.5	9.1	120.1
Pumps & Aux.	6.9	6.9	8.4	8.3	8.8	9.9	9.5	9.9	9.5	8.5	7.6	7.8	101.9
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	36.9	35.2	41.0	39.4	37.9	39.4	39.0	40.0	38.4	37.9	37.4	39.0	461.4
Task Lights	3.1	3.1	3.7	3.6	3.2	3.6	3.4	3.6	3.4	3.2	3.2	3.4	40.6
Area Lights	27.0	26.8	32.2	30.8	28.3	30.8	29.6	30.9	29.5	28.3	28.2	29.6	351.8
Total	89.2	87.0	103.9	102.4	110.1	131.4	132.3	133.6	122.0	105.0	95.1	97.0	1,309.0

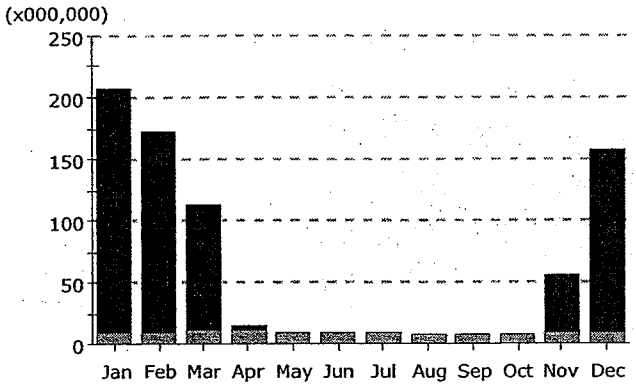
Gas Consumption (Btu x000,000)

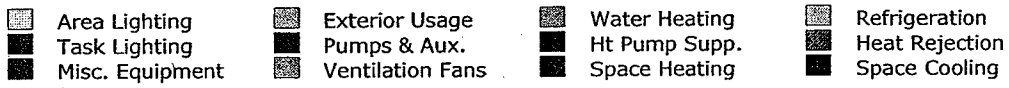
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	227.6	203.7	162.5	90.7	28.0	0.8	-	-	6.3	46.8	129.5	206.8	1,102.8
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	19.4	19.9	23.9	22.5	19.2	19.5	17.5	17.5	16.7	16.7	17.8	20.0	230.8
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	247.0	223.5	186.5	113.2	47.2	20.4	17.5	17.5	23.1	63.5	147.3	226.9	1,333.6

Electric Consumption (kWh)



Gas Consumption (Btu)





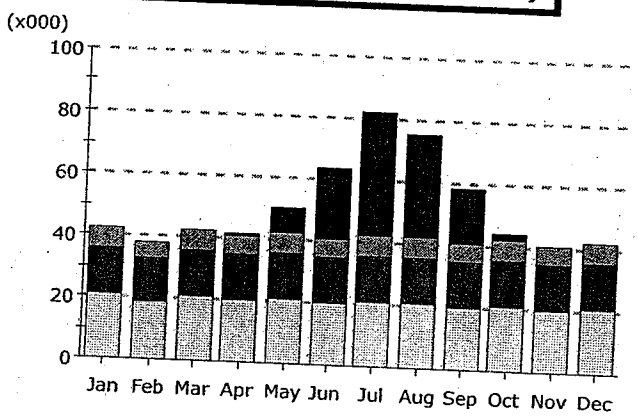
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.01	0.32	8.83	25.88	33.71	28.91	18.28	3.21	0.16	-	119.31
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.78	4.62	5.46	5.25	4.99	5.25	5.20	5.25	5.04	4.99	4.83	5.04	60.68
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	17.02	15.97	18.34	17.68	17.43	17.68	17.83	17.94	17.28	17.43	16.88	17.54	209.02
Task Lights	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.09	1.06
Area Lights	25.44	24.53	28.91	27.81	26.51	27.81	27.57	27.84	26.74	26.51	25.67	26.77	322.09
Total	47.51	45.36	52.99	51.29	57.87	76.71	84.40	80.03	67.43	52.28	47.77	49.61	713.24

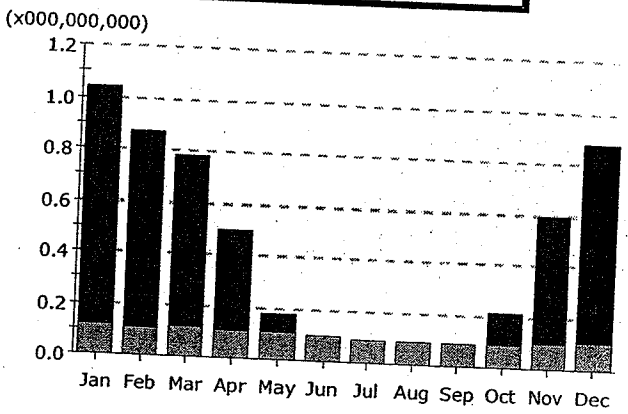
Gas Consumption (Btu x000,000)

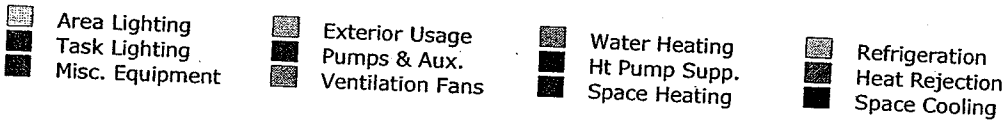
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	197.67	162.62	101.01	3.80	-	0.03	-	-	-	-	47.86	148.52	661.50
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	9.68	9.53	11.16	10.55	9.51	9.19	8.62	8.28	7.94	8.26	8.51	9.49	110.70
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	207.35	172.15	112.17	14.35	9.51	9.22	8.62	8.28	7.94	8.26	56.36	158.00	772.21

Electric Consumption (kWh)



Gas Consumption (Btu)





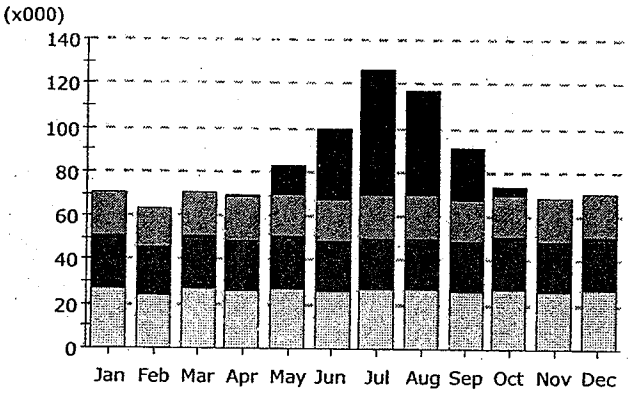
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.74	8.48	23.36	40.16	33.85	17.81	2.23	0.12	-	126.75
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	6.19	5.59	6.19	5.99	6.19	5.99	6.19	6.19	5.99	6.19	5.99	6.19	72.83
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	14.84	13.40	14.84	14.36	14.84	14.36	14.84	14.84	14.36	14.84	14.36	14.84	174.67
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	20.90	18.88	20.90	20.23	20.90	20.23	20.90	20.90	20.23	20.90	20.23	20.90	246.13
Total	42.11	38.04	42.10	41.45	50.43	63.93	82.08	75.78	58.38	44.22	40.85	42.10	621.47

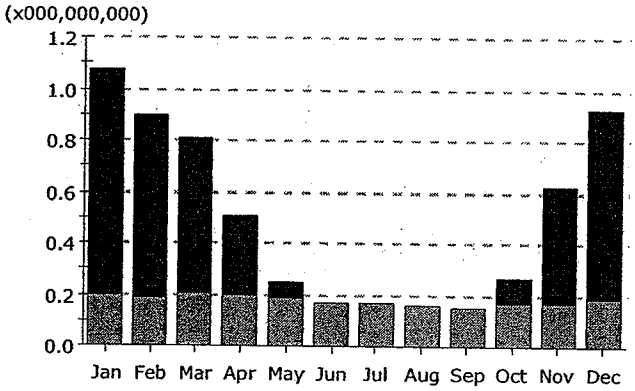
Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.93	0.77	0.66	0.39	0.08	0.00	0.00	0.00	0.00	0.12	0.50	0.77	4.23
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.11	0.10	0.12	0.11	0.11	0.10	0.09	0.09	0.09	0.09	0.10	0.11	1.21
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.04	0.87	0.78	0.50	0.18	0.10	0.09	0.09	0.09	0.21	0.60	0.88	5.43

Electric Consumption (kWh)



Gas Consumption (Btu)



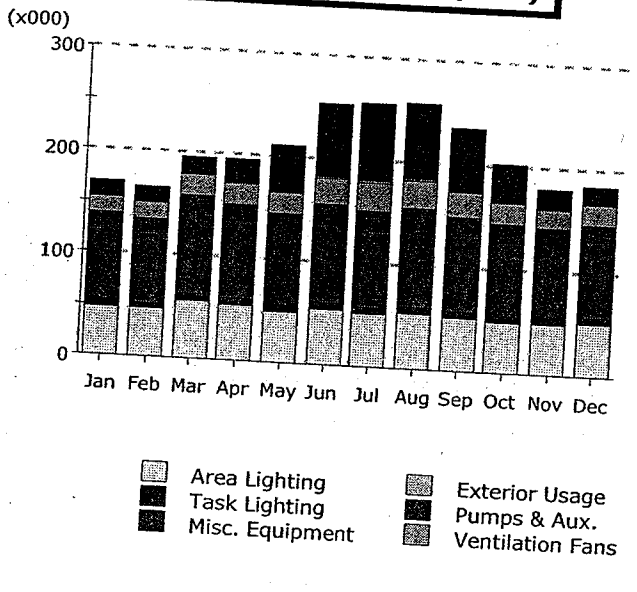
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.0	1.2	12.8	32.5	57.4	47.9	24.2	3.4	0.2	0.0	179.7
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	19.4	17.5	19.4	18.7	19.4	18.7	19.4	19.4	18.7	19.4	18.7	19.4	228.1
Pumps & Aux.	0.7	0.7	0.7	0.6	0.1	-	-	-	0.0	0.2	0.6	0.7	4.3
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	23.7	21.4	23.7	23.0	23.7	23.0	23.7	23.7	23.0	23.7	23.0	23.7	279.3
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	26.5	24.0	26.5	25.7	26.5	25.7	26.5	26.5	25.7	26.5	25.7	26.5	312.3
Total	70.3	63.6	70.3	69.1	82.6	99.9	127.0	117.5	91.6	73.2	68.2	70.3	1,003.7

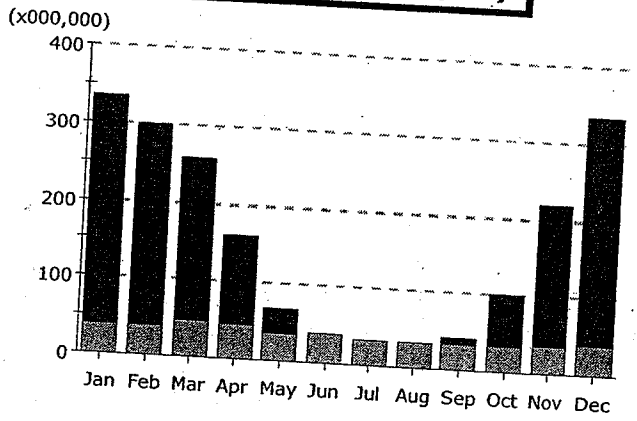
Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.88	0.71	0.60	0.31	0.06	0.00	-	-	0.00	0.10	0.45	0.73	3.85
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.20	0.19	0.21	0.20	0.19	0.17	0.17	0.16	0.15	0.16	0.17	0.19	2.16
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.08	0.90	0.81	0.51	0.25	0.17	0.17	0.16	0.16	0.26	0.62	0.92	6.01

Electric Consumption (kWh)



Gas Consumption (Btu)



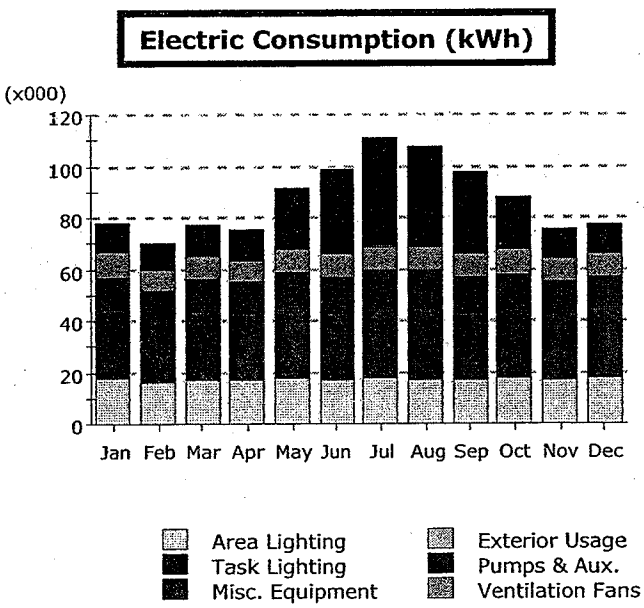
Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

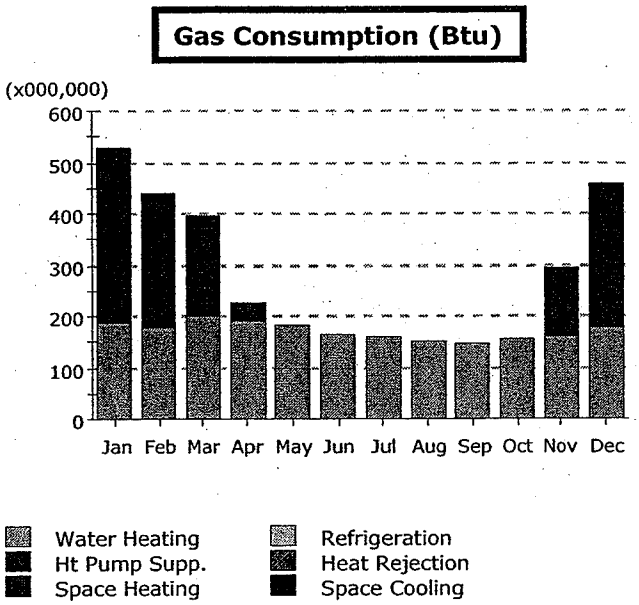
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	14.2	13.8	18.3	22.7	46.6	71.4	75.2	73.0	61.7	37.6	20.9	18.4	473.7
Heat Reject.	-	-	-	0.0	0.4	2.0	2.7	2.1	1.2	0.2	0.1	0.0	8.6
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	16.7	16.8	20.3	19.7	19.8	25.5	26.0	26.0	22.9	19.2	17.6	18.5	248.8
Pumps & Aux.	14.0	13.9	17.1	17.0	17.9	20.2	19.3	20.2	19.2	17.2	15.4	15.8	207.3
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	70.4	67.2	78.1	75.1	72.4	75.1	74.3	76.2	73.2	72.4	71.3	74.3	879.9
Task Lights	6.6	6.6	8.0	7.6	6.9	7.6	7.3	7.6	7.3	6.9	6.9	7.3	86.6
Area Lights	45.9	45.6	54.8	52.4	48.1	52.4	50.4	52.6	50.2	48.1	48.0	50.4	599.0
Total	167.9	163.7	196.6	194.6	212.1	254.2	255.1	257.7	235.7	201.5	180.2	184.6	2,503.9

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	298.5	261.7	213.2	117.2	30.1	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	37.2	38.2	46.0	43.3	37.0	37.6	33.7	33.8	10.5	68.4	184.9	295.9	1,480.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	335.8	299.9	259.2	160.5	67.1	37.6	33.7	33.8	42.7	100.5	219.2	334.4	1924.2





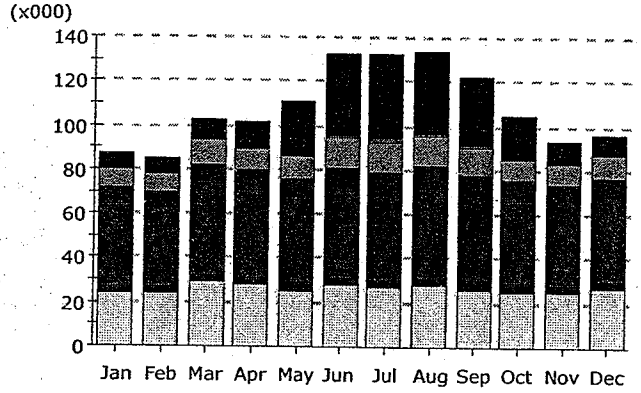
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	12.2	10.8	12.1	12.6	24.1	33.0	41.3	38.7	31.6	21.1	12.0	12.0	261.6
Heat Reject.	-	-	-	-	0.1	0.2	0.5	0.4	0.1	0.0	-	-	1.3
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	9.1	8.1	8.9	8.6	9.0	8.6	9.0	8.9	8.6	9.0	8.7	9.0	105.4
Pumps & Aux.	12.8	11.4	12.5	12.2	14.1	14.5	15.7	15.5	14.5	13.9	12.3	12.6	161.9
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	26.8	24.1	26.7	25.8	26.7	25.8	26.7	26.7	25.9	26.7	25.9	26.7	314.6
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	17.7	15.7	17.2	16.7	17.5	16.7	17.5	17.3	16.8	17.6	16.9	17.4	205.0
Total	78.4	70.2	77.4	75.9	91.6	98.9	110.7	107.5	97.5	88.4	75.7	77.7	1,049.9

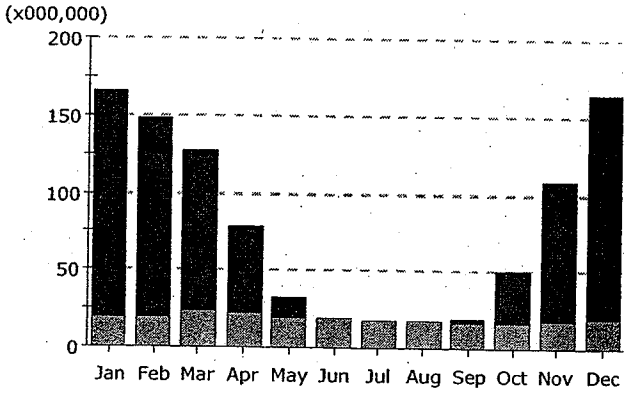
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	342.1	261.2	195.7	36.4	1.3	-	-	-	-	-	130.5	277.9	1,245.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	188.8	179.1	201.9	191.8	181.4	166.5	159.6	152.6	146.9	156.4	161.7	179.7	2,066.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	530.9	440.2	397.5	228.2	182.7	166.5	159.6	152.6	146.9	156.4	292.2	457.6	3,311.4

Electric Consumption (kWh)



Gas Consumption (Btu)



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	7.3	7.1	9.4	11.7	24.1	37.1	39.1	37.9	32.0	19.5	10.8	9.5	245.5
Heat Reject.	-	-	-	0.0	0.2	1.0	1.4	1.1	0.6	0.1	0.0	0.0	4.5
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	8.6	8.6	10.5	10.2	10.3	13.3	13.6	13.6	12.0	10.0	9.1	9.5	129.4
Pumps & Aux.	7.3	7.3	8.9	8.9	9.3	10.5	10.1	10.5	10.0	9.0	8.1	8.3	108.2
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	36.9	35.2	41.0	39.4	37.9	39.4	39.0	40.0	38.4	37.9	37.4	39.0	461.5
Task Lights	3.1	3.1	3.7	3.6	3.2	3.6	3.4	3.6	3.4	3.2	3.2	3.4	40.5
Area Lights	24.1	23.9	28.8	27.6	25.3	27.6	26.5	27.6	26.4	25.3	25.2	26.5	314.7
Total	87.4	85.2	102.4	101.4	110.5	132.5	133.0	134.3	122.8	105.0	93.8	96.1	1304.3

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	146.69	128.17	103.88	56.79	13.46	-	-	-	2.93	33.06	90.65	145.20	720.83
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	19.32	19.81	23.87	22.44	19.19	19.49	17.49	17.52	16.70	16.63	17.77	19.99	230.22
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	166.01	147.98	127.74	79.23	32.65	19.49	17.49	17.52	19.63	49.69	108.43	165.18	951.05

Stationary Source - CO2 Emission Results

CO2 Conversion Factors	Electricity	1107	lb CO2/Mwh	ISO-New Elgnad Marginal Emissions Report
	Gas	117.08	lb CO2/Mbtu	The Energy Information Administration Documentation for Emissions for GHG

Coverage	City	Analysis Year	Building Location
MA	Boston	2016	Burlington, MA

	Building Type	Total Elec. (Mwh)	CO2 from electricity (lbs)	s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	s (tons)	TOTAL CO2 (tons)
Baseline Condition (2016)	Retail	733.48	811962.36	405.98	1457.2	170608.976	85.30	491.29
	Restaurant	652.66	722494.62	361.247	5.37	628.72	0.31436	361.56
	Hotel	1042.2	1153715.4	576.857	5.92	693.11	0.346555	577.20
	Office A	2515.2	2784326.4	1392.163	2590.6	303307.45	151.6537	1543.82
	Residential	1064.6	1178512.2	589.2561	3663.2	428887.46	214.4437	803.70
	Office B	1309.8	1449948.6	724.9743	1333.6	156137.89	78.068	803.04

	Building Type	Total Elec. (Mwh)	CO2 from electricity (lbs)	s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	s (tons)	
(2016)	Retail	713.24	789556.68	394.78	772.21	90410.3468	45.21	439.98
	Restaurant	621.47	687967.29	343.983	5.43	635.74	0.31787	344.30
	Hotel	1003.7	1111095.9	555.548	6.01	703.65	0.351825	555.90
	Office A	2503.9	2771817.3	1385.908	1924.2	225285.34	112.642	1498.55
	Residential	1049.9	1162239.3	581.119	3311.4	387698.71	193.849	774.97
	Office B	1304.3	1443860.1	721.93	951.05	111348.93	55.67447	777.60

Total CO_2 Emissions

Total CO2 Emission Results (Stationary and Mobile Sources)

Baseline Conditions (2016)		Net Increase from No Build to Build		
CO2 from Building/Energy		CO2 from Mobile Source		
Retail	4001.5 tons			
Restaurant	309.1 tons			
Hotel	577.2 tons			
Office A	1543.8 tons			
Residential	1607.4 tons			
Office B	12848.7 tons			
sum	**20,887.7** tons	**22,923.1** tons	Total Yearly CO2 Emission Increase=	**43,810.8** tons
				43.8 Mega_tons

Improved Conditions (2016)		Net Increase from No Build to Improved Build Condition (2016)		
CO2 from Building/Energy		CO2 from Mobile Source		
Retail	3583.7 tons			
Restaurant	294.4 tons			
Hotel	555.9 tons			
Office A	1498.6 tons			
Residential	1549.9 tons			
Office B	12441.7 tons			
sum	**19,924.1** tons	**22,571.7** tons	Total Yearly CO2 Emission Increase=	**42,495.8** tons
				42.5 Mega_tons

Northwest Park Redevelopment FEIR #14000

GHG Emissions Improvements

The EEA and MEPA draft GHG emissions policy encourages project proponents to identify and quantify measures that would reduce or minimize GHG emissions from mobile sources and direct and indirect stationary sources. The Proponent has developed physical and operational mitigation measures to be included in the Project, including:

Mobile Sources

- TDM measures (described above in the Ozone mesoscale analysis section and more fully in Chapter 3, *Transportation*) are also expected to reduce GHG emissions related to Project-induced mobile sources.

Stationary Sources

As discussed in Chapter 1, *Project Description* sustainable design principles, including energy efficiency are proposed as part of the Project. The following strategies will be incorporated into the Project in efforts to reduce GHG emissions from Project-related stationary sources:

- Use high-albedo roofing materials
- Install high-efficiency HVAC systems
- Eliminate or reduce use of refrigerants in HVAC systems
- Reduce energy demand using peak shaving or load shifting strategies
- Maximize interior daylighting through floor plates, increased building perimeter and use of skylights and light wells
- Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance
- Incorporate super insulation to minimize heat loss
- Install energy efficient measure, such as motion sensors for lighting and building climate control

Wetlands

In keeping with the sustainable design/development principles, the site design aims to avoid significant direct impacts to wetland or other natural resources on- and adjacent to the Site. Mitigation for the proposed impacts to Bank, Bordering Vegetated Wetland and Bordering Land Subject to Flooding will be provided to offset any Project-related impacts. Generally, wetland mitigation will consist of the creation of a stream and wetland complex downstream of Wetland 3 and enhancement of the existing floodplain area adjacent to Fourth Avenue. The mitigation area will be constructed within an existing paved parking area. Figures 6.1 and 6.2 show the proposed on-site wetland mitigation.

BG

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
205B Lowell Street, Wilmington, MA 01887 • (978) 694-3200

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

January 23, 2008

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Burlington
Northwest Park Redevelopment
Middlesex Turnpike
EEA # 14000

Attn: MEPA Unit

Dear Secretary Bowles:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the Final Environmental Impact Report (FEIR) submitted by the Nordblom Company to demolish several existing industrial/commercial buildings in order to construct a 3,280,000 square foot mixed use project comprised of about 1.3 million square feet of housing, retail, and office space in Area A, and 1.9 million square feet of new and redeveloped office space in Area B on a 127 acre site, which is in a Planned Development District in Burlington (EEA #14000). The mixed-use project has not changed since the ENF review; the development plan includes about 300 units of housing, 600,000 square feet of retail with restaurant space, 1,900,000 square feet of office/commercial, a 200 room hotel, and other uses, such as child/adult day care, medical facilities, a theatre, health club, and a community center, which would be built out over about a 10 year period. However, the number of parking spaces has increased from an estimated 8,700 parking spaces in the ENF to a range of 9,630 to 11,630 spaces. Currently, there are about 4,800 parking spaces on site. The Department provides the following comments on this project.

Wetlands

The wetlands impacts do not appear to have changed since the DEIR; the proposed project would alter 370 feet of bank, 1,400 square feet of bordering vegetated wetland (BVW), and alter 420,000 square feet of bordering land subject to flooding. Wetlands mitigation plans create a stream with bank and bordering vegetated wetland resources by day-lighting a culverted section downstream of Wetland 3 and north of North Avenue, as depicted in Figures 6.1 and 6.2. The FEIR indicates that the incremental flood volumes would be maintained at existing conditions (page 6-11), although details were not available and will need to be provided in the Notice of Intent filing.

Stormwater

The total suspended solids removal calculations in Attachment 6 in the FEIR indicate that the primary treatment devices proposed are Stormceptor units, which are accepted as pre-treatment devices only in critical areas, such as Zone II, wellhead protection areas on redevelopment sites, unless site constraints prevent the use of best management practices, which are to be used in critical areas. The EIR review has represented that the project could be designed to be in compliance with the Stormwater Management Standards. Therefore, the stormwater management plan should be revised in those areas where stormwater would only been conveyed through a catch basin and particle separator prior to discharge.

Low impact development (LID) measures will be incorporated into the stormwater management plan, as the site plan design is refined, where practical and feasible. The use of low impact development measures is advanced under the stormwater regulations that went into effect on January 2, 2008. The costs associated with LID are often lower than more conventional stormwater management practices according to a new report entitled, *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices*, which was recently released by the U.S. Environmental Protection Agency. A copy of the report is available at the following EPA website: http://www.epa.gov/owow/nps/lid/costs07/. Therefore, it is anticipated that the Notice of Intent filing would include a stormwater management plan that incorporates many, if not all of the low impact development measures under consideration in the FEIR, including bioretention cells, permeable pavement in areas where infiltration of stormwater would not adversely impact site remediation, and rainwater reuse.

Although street sweeping is proposed, the scheduling of the sweeping program will need to be better defined. The proponent should demonstrate that the sweeping frequency with high efficiency vacuum equipment would have the capability to remove sediment and associated contaminants effectively from within the wellhead protection area for the public water supply, consistent with the stormwater regulations, and to be given 10 percent TSS removal credit.

Wastewater

The FEIR has provided enough additional information to demonstrate that the proponent's infiltration/inflow removal plan, when implemented, would be satisfactory for compliance with the Administrative Consent Order (NE-06-1N001), which was issued to the town of Burlington to eliminate and reduce I/I which results in sanitary sewer overflows, including overflows from the Horn Pond Interceptor downstream of the project site.

The proposed mixed-use project would increase sewer flow by 275,295 gallons per day, and the total wastewater flow would increase to 374,963 gallons per day. The FEIR indicates that proponent's I/I removal plan, which would achieve the required 5:1 ratio would result in elimination of 1.38 million gallons of infiltration and inflow from the municipal sewer system.

According to the FEIR, a preliminary study of the sewer system upstream of the Terrace Hall pump station, (and downstream of the project site) did not identify sewer capacity deficiencies. However, four areas studied independently by the proponent may have significant

I/I (Figures 5.6 – 5.8). The proponent will evaluate the condition of sewer manholes in these areas, and either remove I/I or reimburse the town for that a portion of the I/I removal work being undertaken by the town, consistent with the town's Sewer Allocation Policy. In addition, the proponent anticipates that a portion of the I/I removal from repair work being undertaken by the town in area Phase 3A will be available to the proponent for purchase to fulfill I/I removal obligations.

The FEIR has provided in Tables 5-2, 5-3, and 5-4, a plan for phasing in the I/I removal work, prior to the addition of any net new wastewater flow to the municipal sewer system. In Phase 1, 27,635 gallons per day of I/I will be removed, Phase 2 will remove 902,045 gpd, and Phase 3 will eliminate 446,800 gpd. The total I/I removal planned is 1,376,480 gpd. MassDEP recommends that the proponent's plan for I/I removal be sufficiently flexible to accommodate changes in the development build out to ensure that the work is accomplished in advance of increasing the wastewater flow. The details of an adjusted plan will need to be worked out with MassDEP in permitting. The proponent should meet with MassDEP in advance to ensure that the project and mitigation are coordinated and phased as necessary.

Air Quality

The FEIR demonstrates some reasonable progress over the DEIR towards achieving the goal of the MEPA Policy. The proponent fairly responded to the MEPA Certificate on the DEIR and MassDEP comments. The proponent made data corrections, which were requested and restated commitments to specific mitigation measures for both stationary and mobile sources. In reference to the Section 61 commitment, the proponent listed those specific measures on pages 7-9 to 7-11. Where MEPA or MassDEP comments sought a greater or additional commitment from the DEIR, such as purchasing power from renewable or using on-site power generation, the proponent committed to "evaluate" those as part of the sustainable goals described in C. 1.

Massachusetts Contingency Plan (MCP) /21E

The FEIR acknowledged that the proponent would comply with all applicable requirements set forth in 310 CMR 40.0000. The Final General Environmental Management (GEM) Plan will be submitted to MassDEP. The revised outline for the GEM in Appendix F indicates that the plan would provide an overview of the environmental conditions, the requirements of a Release Abatement Measure (RAM) plan, notification of release conditions (where applicable), a construction monitoring program, soil, groundwater, and surface water management, monitoring well management, a plan for potential vapor intrusion and soil gas, a blasting plan, and a demolition waste management plan.

Recycling Issues

The FEIR has affirmed that the project would coordinate a recycling program with the project tenants and that the building design will accommodate recycling facilities that are easily accessible and user-friendly.

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Jack Zajac at (978) 694-3240 for further information on the wastewater issues, Rachel Freed at (978) 694-3258 for wetlands issues, and Leticia Ruiz-Boyle at (978) 694-3352 regarding the MCP. Should you have any questions on air quality issues, please contact Jerome Grafe at (617) 292-5708. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Phil Weinberg, Jerome Grafe, MassDEP-Boston
Eric Worrall, Stephen Johnson, Kevin Brander, Rachel Freed, James Persky, Joanne Fagan, Jill Provencal, Jack Zajac, Leticia Ruiz-Boyle, MassDEP-NERO
Town of Burlington, Planning Board, Conservation Commission

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January 30, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
FINAL ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Northwest Park Redevelopment
PROJECT MUNICIPALITY	: Middlesex Turnpike - Burlington
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 14000
PROJECT PROPONENT	: Nordblom Company
DATE NOTICED IN MONITOR	: December 24, 2007

As Secretary of Energy & Environmental Affairs, I hereby determine that the Final Environmental Report (FEIR) submitted on the above project **adequately and properly** complies with the Massachusetts Environmental Policy Act (G. L., c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00).

Project Description

As described in the FEIR, the proposed project consists of the redevelopment of Northwest Park into approximately 3.28 million square feet (sf) of mixed-use development. The Mixed-Use Phase or Area A includes approximately 1.28 million sf of space. It is comprised of approximately 300 residential units, 600,000 sf of retail/restaurant space, an approximately 200-room hotel, 260,000 sf of general office space, and additional open space. Area A is approximately 48 acres. The Office Phase or Area B includes approximately 2 million sf of general office space. Area B is approximately 79 acres. Both Areas A and B will be constructed simultaneously. The existing project site contains approximately 1.34 million sf of existing office space with some commercial uses with parking for 4,830 cars in surface lots. These buildings will be demolished or reconfigured to make way for the proposed project. The site is adjacent to Route 3 and close to I-95 (Route 128). It is comprised of approximately 127 acres between Route 3 and the Middlesex Turnpike.

The project requires a mandatory EIR. It will require an Indirect Access Permit, a permit

to blast within 250 feet of a State Highway Layout, and Traffic Signal Permits from the Massachusetts Highway Department (MassHighway). The project may require a Construction Dewatering Permit, a Notice of Construction & Demolition, a Notice Regarding Demolition and Construction, a Modification Permit for the water distribution system, a Cross Connection Permit, and a Sewer Extension/Connection Permit from the Department of Environmental Protection (MassDEP). It may need to obtain a Construction Dewatering Permit from the Massachusetts Water Resources Authority (MWRA). The project must comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges from a construction site and an NPDES Remediation General Permit. It may require a Programmatic General Permit from the U.S. Army Corps of Engineers. An Order of Conditions will be required from the Burlington Conservation Commission for impacts to wetland resource areas and buffer zones. MEPA jurisdiction extends to land alteration, traffic, air quality, wetlands, stormwater, blasting, water, and wastewater issues that may have significant environmental impacts.

Using the unadjusted Institute of Traffic Engineers Trip Generation land use codes (220, 310, 710, and 820), the proponent has estimated that the project will generate approximately 39,735 average weekday (unadjusted) vehicle trips and approximately 36,930 Saturday trips. The proponent has estimated that the project would generate about 20,830 net new vehicle trips on a weekday and 22,890 trips on Saturday when adjustments are made for shared, pass-by, diverted link, and existing vehicle trips. Access to the project site from the regional highway system would be provided from Second, Third, and Fourth Avenues to the Middlesex Turnpike and to I-95 and to Route 62 and its interchange with Route 3. The proponent has estimated that the project will require between 9,630 and 11,630 shared parking spaces in structured and surface facilities.

The proposed project will be connected to existing municipal water and sewer service. It will consume approximately 412,459 gallons per day (gpd) of water (daily design flow) and will generate approximately 375,000 gpd of wastewater flow (Title 5).

Review of the FEIR

The FEIR included a detailed description of the project with a summary/history of the project. It described each state agency action required for the project. The FEIR demonstrated how the project is consistent with the applicable performance standards. It contained sufficient information to allow the permitting agencies to understand the environmental consequences related to the project.

The proponent believes that the Preferred Alternative (3.28 million sf) has been designed to maximize the site layout and the sustainable design/Low Impact Development (LID) opportunities. These LID opportunities will minimize water, wastewater, stormwater and

wetland impacts.

A full Roadway Segment Analysis (RSA) for the Middlesex Turnpike between Middlesex Commons to Burlington Mall Road (BMR) was conducted by the proponent. The proponent has proposed some traffic signal coordination/interconnection, and it is providing two through travel lanes in either direction with left/right turning lanes along the Middlesex Turnpike. The RSA included access management along the corridor. The proponent provided supplemental material on January 24th explaining the RSA charts (Figures 3.1a and 3.1b.

The FEIR provided a breakdown of parking needs by land use category/use, time of day, and employee/customer/ resident/visitor category to demonstrate the need for the proposed parking spaces. It described how the number of parking spaces needed was determined. Parking at the site has decreased from the DEIR's 12,040 spaces in parking garages and surface lots or 3.67 spaces per 1,000 sf of space. The proponent has stated that Area A requires a minimum of 3,630 spaces, which includes a 10 percent reduction due to internal capture rates between office and retail uses. Area B requires a minimum of 5,600 spaces based on the assumption that there is no shared parking. According to the proponent, the project will require a minimum of 9,230 parking spaces. The proponent is proposing to provide between 9,630 and 11,630 spaces, which is slightly more than the minimum Urban Land Institute-suggested minimum, but less than the typical market number of 14,465 spaces as required by zoning. The 9,630 parking spaces are 2.9 spaces per 1,000 sf of space, and the 11,630 spaces are 3.6 spaces per 1,000 sf of space. The proponent is not proposing to charge fees for parking. During final project design, all valet parking stations will be identified, with parking for the valets located in the most remote areas of structured parking or surface lots. The taxi-parking areas will be identified during final design, and the proponent will contact Zip Car or a similar service to determine if it is willing to expand into the suburban areas in the future.

The FEIR showed in Figure 3.2 where traffic calming measures are being proposed. The proponent will provide pedestrian connections and signage to the Burlington Mall, and Figure 3.3 displayed these connections. The FEIR stated that the proponent would provide approximately one bicycle parking space for every three residential unit (100 spaces); bicycle racks at each office building sufficient to park four bicycles (76 spaces); for retail uses, one bicycle parking space provided for each 100 automobile parking spaces (24 spaces); and ten bicycle parking spaces for hotel employees. The proponent will supply a total of 210 bicycle parking spaces. It will also provide additional bicycle spaces as demand dictates beyond the initial bicycle parking program. Figure 1.7 showed where bicycle parking areas would be located on the project site. There are no private shuttle bus routes within the area operating to the Anderson Transportation Center or other transit centers. The proponent has committed to contribute $25,000 to facilitate the expansion of the B-line transit service and to work with future businesses that locate within the project site for future contributions.

The FEIR presented a comprehensive Transportation Demand Management (TDM) Program.

The FEIR provided the 2016 No-Build baseline information for CO2 emissions. The proponent provided additional sustainable design principles and TDM measures to offset the potential increase in CO2 emissions in the 2016 Build scenarios. The proponent will finalize a landscape plan that will include diverse plantings to help minimize pollutant impacts on residences at the site. The FEIR listed the mitigation measures to reduce GHG emissions.

Adequate compensatory flood storage has been provided within the bank and wetland mitigation area on the western side of the site and also within the proposed green space area directly north of Fourth Avenue to mitigate and balance the flood plain storage on the site. The FEIR provided an evaluation of the subsurface conditions where stormwater infiltration is proposed. It evaluated the potential for irrigation wells in both Areas A and B. The proponent proposed to use sand with a non-sodium chloride deicing or anti-caking agent. .

The proponent will need to eliminate approximately 1.3 million gallons of Infiltration/Inflow (I/I). In the FEIR, the proponent has identified four potential areas for I/I removal. It has considered the installation of High Efficiency Toilets throughout the project to reduce water demand. The FEIR determined that the 24-inch sewer within the Middlesex Turnpike has sufficient available capacity to handle the proposed wastewater from the project. The FEIR has addressed this I/I issue and has worked closely with the Massachusetts Water Resources Authority (MWRA), MassDEP, and the Town of Burlington.

The FEIR discussed the consistency of the project with the provisions of the National Pollutant Discharge Elimination System (NPDES) General Permit from the U.S. Environmental Protection Agency for stormwater discharges from construction sites. It included a discussion of best management practices employed to meet the NPDES requirements. The FEIR considered additional Low Impact Development (LID) measures that may minimize the volume of stormwater runoff to be treated and controlled by maintaining the existing hydrologic functions. LID techniques were incorporated into the drainage plan early in the project design phase. The FEIR considered other LID tools to reduce the amount of impervious areas. The proponent is considering pervious pavement if allowed by Town of Burlington, bioretention cells (rain gardens), and rainwater harvesting. It included a draft Erosion and Sedimentation Control Manual in Appendix C. The site contractor will utilize this draft manual to prepare a Pollution Prevention Plan. The stormwater management plan for this project and the Town of Burlington's stormwater program are compatible according to the Town of Burlington. The FEIR outlined the monitoring program of groundwater levels.

The FEIR addressed MassDEP's concerns regarding conformance to the Critical Area Standard 6. It identified measures to contain stormwater runoff in the event of an emergency spill. The snow management plan for the project was displayed in Figure 4.4, and it showed the locations on-site where snow will be plowed and stored.

The FEIR outlined how this proponent will coordinate its construction program with other nearby projects. The number of truck trips required to handle the filling operation and the truck routes for fill removal will be determined by the construction phasing of the project and evaluated with Burlington safety officials. The proponent will develop a Blast Design Plan, which will describe any blasting proposed at the project site. The Blast Design Plan will identify the proponent's plans to deal with blasting and the notification process to adjacent land owners and local officials.

The FEIR included renderings of the proposed buildings. The proponent has incorporated native plants and low water using landscape materials.

The FEIR identified how construction activities will be coordinated with the ongoing remedial activities at MCP sites at the project site. A comprehensive groundwater monitoring plan capable of monitoring contaminant concentrations in overburden, shallow bedrock, and deep bedrock groundwater will be undertaken during construction and blasting activities.

The proponent has incorporated sustainable design elements into the project design. The FEIR summarized the proponents' efforts to ensure that this project includes Leadership in Energy and Environmental Design (LEED) Certified buildings or the equivalent.

FEIR Mitigation

The FEIR included a separate chapter on mitigation measures. Draft Section 61 Findings for MassHighway and MassDEP were included in Appendix H. The mitigation chapter and the Draft Section 61 Findings contained clear commitments to mitigation, estimates of the individual costs of the proposed mitigation, and the identification of the parties responsible for implementing the mitigation. A schedule for the implementation of mitigation was also included, which described the phasing of the mitigation.

In the FEIR, the proponent has committed to the following mitigation measures:

- Provide a minimum increase of 10 percent above the existing infiltration volume of groundwater into the surrounding aquifer.
- Implement a General Environmental Management Plan to mange existing environmental conditions in the project area in accordance with the requirements of the Massachusetts

Contingency Plan (MCP) and the requirements o the Town of Burlington, approximately $650,000.

- Provide approximately 1.38 million gpd of I/I removal for project's added wastewater flows to the municipal system, between $1 and $2.2 million. It has identified four potential areas for I/I removal: Wheeler Road, Meadow Road, the Sandy Brook Area, and the Peach Orchard Area.
- Fund the Town of Burlington for a Town Sewer Study to identify wastewater I/I projects up to $300,000.
- Provide an independent sewer study, approximately $50,000.
- Utilize ultra-low sulfur diesel fuel in construction vehicles.
- If requested by the Burlington Conservation Commission, replace up to 7,500 sf of BVW, provide 370 feet of bank mitigation and maintain the same floodplain volume, approximately $150,000.
- Fund a Regional Transportation Master Plan for the area to identify and address long-term transportation improvements, approximately $150,000.
- Designate 10 percent of the housing units as affordable units to comply with the Commonwealth's affordable housing policies, approximately $1.5 million..
- Install a fully-actuated traffic signal at the Middlesex Turnpike/Third Avenue intersection, make geometric improvements, and coordinate the new signal with the next three signals along the Turnpike to the north, approximately $600,000.
- Modify traffic signal phasing and timings at the Middlesex Turnpike/Second Avenue/ Burlington Mall Road (BMR) intersection and make geometric improvements with accommodations for pedestrians and bicycles, approximately $1.2 million.
- Install a fully-actuated traffic signal at the South Avenue/Second Avenue intersection, coordinate the new signal with the signal at Middlesex Turnpike/Second Avenue/BMR, and make geometric improvements with accommodations for pedestrians and bicycles, approximately $400,000.
- Design signal timing modifications and geometric improvements with pedestrian accommodations at Middlesex Turnpike/Fourth Avenue, approximately $250,000.
- Provide signal phasing and lane reconfigurations at Route 62/Network Drive, approximately $10,000 (provided by the Tri –Town Commission).
- Provide 100 percent design plans for the full buildout of the interchange and widen the northbound Middlesex Turnpike approach to provide a 4-lane cross-section and turn lane between Wheeler Road to a point past the I-95 northbound ramps at the Middlesex Turnpike/I-95 Northbound Ramps/Wheeler Road intersection, approximately $750,000.
- Provide 100 percent design plans for the full buildout of the interchange and install queue detection on the southbound off-ramps and coordinate with the traffic signal system along the Middlesex Turnpike at the Middlesex Turnpike/Route 128/I-95 Southbound interchange, approximately $275,000.
- Design and construct the continuation of the right-hand lane through the weaving section

on the Route 128/I-95 Southbound frontage road between the Middlesex Turnpike on-ramp and the Route 3 Northbound on-ramp and other geometric improvements, approximately $100,000.

- Provide signal timing modifications after the occupancy of each 300,000 sf by the proponent at the following intersections: Route 62/Route 3 Southbound Ramps; Route 62/Route 3 Northbound Ramps/Crosby Drive; Route 62/Middlesex Turnpike; Middlesex Turnpike/Terrace Hall Avenue; and Middlesex Turnpike/South Avenue/Burlington Mall Driveway ($5,000 per visit per intersection).
- Modify the signal timing at the BMR/Marriott Driveway prior to the occupancy of any portion of Area A or 300,000 sf of Area B, approximately $5,000.
- Evaluate and utilize bio-retention cells, permeable pavement, and rainwater harvesting.
- Provide a mix of sand and a non-sodium chloride de-icing material for the maintenance of parking and roadways in winter.
- Provide one bicycle parking space for three residential units (100 spaces)(suitable for long- and short-term parking), one bicycle parking space for every 100 automobile spaces for retail uses (24 spaces), one bicycle parking space for every 100 automobile spaces for office uses (76 spaces), no bicycle parking accommodations provided for guests of the hotel, but the project will include approximately 10 bicycle parking spaces for hotel employees. This equates to a total of approximately 210 bicycle parking spaces project-wide.
- Construct up to three miles of sidewalks and a one mile of a shared-use (bicycle/pedestrian) path on the project site and provide short- and long-term bicycle parking facilities throughout the project, approximately $250,000.
- Provide street sweeping within the project site.
- Install a stormwater management system with water quality treatment units, between $700,000 and $1 million.
- Install water-efficient appliances and fixtures (low flush toilets and faucet aerators).
- Utilize low-demand irrigation plantings.
- Provide the following to reduce GHG emissions, where applicable and feasible: highly reflective, light-colored roofing materials; high-efficiency HVAC systems with limited refrigerants; potential use of peak shaving or load shifting energy strategies; maximize interior day lighting by the use of skylights and light wells; incorporate window glazing to balance day lighting, heat loss, and solar heat gain; incorporate significant insulation to minimize heat and cooling losses; install energy motion sensors for lighting and building climate control where feasible.
- Provide a TDM program with an on-site coordinator, flexible working hours, direct deposit of payroll, a guaranteed ride home, preferential parking, and commuter information.
- Provide preferential parking spaces for a car-sharing service (subject to an agreement with a willing car-sharing service such as Zip Car).

- Encourage tenants to provide a subsidy to employees who purchase monthly or multiple trip transit passes.
- Contribute $25,000 to expand the B-Line transit service to the project site and work with future tenants for future contributions.
- Implement a Construction Management Plan (includes traffic).
- Evaluate the application of the LEED-Neighborhood Development (ND) Green Building Rating System.

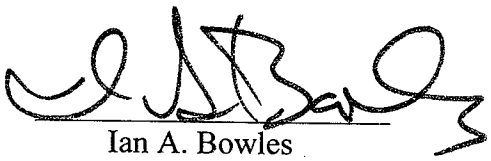
The proponent has suggested that it will contribute 22 percent of the estimated traffic to travel through the Middlesex Turnpike/Route 128/I-95 northbound and southbound ramps. It has estimated that it will cost approximately $3.5 million to construct the needed improvements, which were identified in the FEIR. At the northbound ramps, the proponent has identified that the northbound on- and off-ramps should provide additional queuing and operational enhancements ($700,000) and that the northbound Middlesex Turnpike beneath the Route 128 overpass should be widened and provided with signal timing modifications ($550,000). At the southbound ramps, the proponent has identified that the southbound on- and off-ramps should be provided with additional queuing and operational enhancements to the signal system ($600,000) and that the northbound Middlesex Turnpike approach should be widened and provided with signal timing modifications ($500,000). A 22 percent share of $3.5 million would be approximately $700,000. However, the proponent has committed to fund $1.1 million in interim improvements at these interchanges. The proponent will prepare full design plans for the Route 128/I-95/Middlesex Turnpike interchange. It will provide queue detection along the Route 128/I-95 off-ramps. The proponent will upgrade the Route 128/I-95 Northbound ramps at the Middlesex Turnpike intersection by widening the Middlesex Turnpike to provide an additional northbound approach lane between Wheeler Road and the Route 128/I-95 overpass, adding a left-turn lane into Wheeler Road, and modifying some of the signal phasing and timing beyond what are currently in place.

The proponent has revised its mitigation commitments to implement upon occupancy of up to 300,000 sf of net new building space its Phase 1 schedule of improvements as outlined in Table 3.6 in the FEIR. It will implement prior to site occupancy beyond the above 300,000 sf of net new building space the Phase 2 improvements consistent with Figure 3.35 included in the DEIR. These measures involve upgrades to the Route 128 northbound ramps and any necessary improvements under Route 128 that are needed to support the widening of the ramps and to provide sufficient capacity along the Middlesex Turnpike. MassHighway believes that the above improvements will adequately mitigate the impacts of the project, and as other developments with impacts at this location are proposed, MassHighway will work to implement the improvements. The proponent has also committed to altering the merge configuration on Route 3 northbound and the weave on the I-95 southbound frontage road between the Middlesex Turnpike and Route 3.

Prior to the issuance of the Section 61 Finding by MassHighway, the proponent should provide documentation showing each phase of development with the associated transportation impacts and the required mitigation commitments. This information should clarify the timing of the mitigation implementation. The proponent should provide conceptual plans that show the proposed lane widths and offsets, layout lines and jurisdictions, and land uses (including access drives) adjacent to areas where improvements are proposed. MassHighway will require the proponent to monitor the improvements. This above documentation should be supplied as an Addendum to the proponent's Draft Section 61 for MassHighway, which should be submitted to the MEPA Office by the proponent. I will publish the notice of availability of the proponent's draft Section 61 finding for MassHighway in the Environmental Monitor for a thirty day comment period. The draft Section 61 Finding should also be sent to the list of commenters below.

I note that the proponent has agreed to a substantial package of mitigation commitments. The specific details of these mitigation measures will be resolved within the state permitting process and Section 61 Findings for each agency. The proponent must finalize its permitting requirements with the state agencies as indicated above; agencies must forward final Section 61 Findings to the MEPA Office.

January 30, 2008
DATE



Ian A. Bowles

Comments received:

VHB, 12/31/07
VHB, 1/16/08
VHB, 1/23/08
VHB, 1/23/08
Anne Rowe, 1/23/08
MassDEP/NERO, 1/23/08
VHB, 1/24/08
EOT, 1/28/08

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October 24, 2007

CERTIFICATE OF THE SECRETARY OF ENERGY & ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Meadow Walk at Lynnfield
PROJECT MUNICIPALITY	: Lynnfield and Wakefield
PROJECT WATERSHED	: North Coastal
EOEA NUMBER	: 14096
PROJECT PROPONENT	: PHF-ND Colonial, LLC
DATE NOTICED IN MONITOR	: September 10, 2007

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and Section 11.03 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of an Environmental Impact Report (EIR).

Project Description

As described in the Expanded Environmental Notification Form (EENF), the project consists of the construction of a mixed-use development on a 203-acre parcel in Lynnfield and Wakefield. It will include 395,000 square foot (sf) of retail space, 80,000 sf of office space, and 220-residential units. The housing will consist of 180 rental apartments (including 45 affordable units). In addition, six acres of land will be purchased by the Lynnfield Initiative for Elders (LIFE) for development of 40 units of moderate income housing for seniors. The project includes retention of the northern half of the golf course as a 9-hole golf course and construction of a new club house. The remainder of the golf course (including the existing club house) and the conference center will be demolished. The project includes improvements to the access drives, construction of an internal roadway system, construction of 3,438 parking spaces and installation/expansion of associated infrastructure and utilities, including a stormwater

management system. The project is being developed under M.G.L. Chapter 40R Smart Growth Zoning and Housing Production legislation. According to the EENF, potential environmental impacts include the creation of 55 acres of impervious surfaces, alteration of 1,700 square feet (sf) of Bordering Vegetated Wetlands (BVW), generation of approximately 19,079 average daily vehicle trips (adt) on a weekday, use of 122,010 gallons per day (gpd) of water and generation of 122,010 gpd of wastewater.

As described in the EENF, the site is bounded by Interstate 95 (I-95)/Route 128 and the Saugus River to the south, Audubon Road in Wakefield to the west, Walnut Street in Lynnfield to the east and Reedy Meadow to the north. The site contains an 18-hole golf course including a clubhouse and maintenance buildings, a 54,000 sf conference center, a 55,000 sf Boston Sports Club, 181,400 sf Sheraton Hotel and 975 parking spaces. The site has immediate highway access from I-95/Route 128 via Exit 42 (Pleasure Island Road) and Exit 43 (Walnut Street). The Saugus River provides habitat for the passage of the American eel (Anguilla rostrata), riffle habitat for spawning rainbow smelt (Osmerus mordax) and habitat for the passage, spawning and juvenile development of river herring (Alosa pseudoharengus and Alosa aestivalis). Reedy Meadow is a 540-acre freshwater marsh that has been designated by the National Park Service (NPS) as a National Natural Landmark. According to the 12th Edition of the Massachusetts Natural Heritage Atlas, the project is located within Priority and Estimated Habitats of Rare Species, including habitat for the American Bittern (Botaurus lentiginosus), the Common Moorhen (Gallinula chloropus) and the King Rail (Rallus elegans).

MEPA Jurisdiction and Required Permits

The project is undergoing review and requires preparation of an EIR pursuant to sections 11.03 (1)(a)(1), (1)(a)(2), (6)(a)(6) and (6)(a)(7) of the MEPA regulations, because the project requires state permits and will alter more than 50 acres of land, create more than 10 acres of new impervious surfaces, generate 3,000 or more new adt on roadways providing access to a single location and construct 1,000 or more new parking spaces at a single location. The project requires a Sewer Connection/Extension Permit and a 401 Water Quality Certificate from the Department of Environmental Protection (MassDEP). It requires an Access Permit from the Massachusetts Highway Department (MassHighway). The project may require a Conservation and Management Permit from the NHESP and it may require review by the Massachusetts Water Resources Authority (MWRA). Also, the project requires Orders of Conditions from the local conservation commissions in Lynnfield and Wakefield. The project must comply with the National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges from a construction site of over five acres.

Because the proponent is not seeking financial assistance from the Commonwealth for the project, MEPA jurisdiction extends to those aspects of the project that may have significant environmental impacts and that are within the subject matter of required or potentially required state permits. In this case, MEPA jurisdiction exists over land alteration, traffic/transportation, air quality, wetlands, drainage, rare species and wastewater.

Request for a Single EIR

In accordance with Section 11.05 (7) of the MEPA regulations, the proponent has submitted an Expanded ENF with a request that I allow the proponent to fulfill its EIR obligations under MEPA with a Single EIR, rather than the usual process of a Draft and Final EIR. The Expanded ENF received an extended comment period pursuant to Section 11.06 (8) of the MEPA regulations. The EENF included a detailed project description, a description of existing conditions and resource areas, a summary of site planning to date, an alternatives analysis, traffic study, the stormwater management plan, a greenhouse gas analysis and other information to assist reviewers in understanding the project, its potential environmental impacts and identification of measures to avoid, minimize and mitigate these impacts.

Comments from the Executive Office of Transportation and Public Works (EOT) identify additional traffic analysis that will be required and indicate that remaining traffic and transportation issues can be addressed through a Single EIR. Comments from other state agencies, including MassDEP, MWRA, NHESP and DMF identify significant outstanding issues that must be adequately addressed through MEPA review including identification of a feasible approach for wastewater management, detailed information on wetland impacts and alternatives that avoid these impacts and revisions to the site plan and stormwater management plan to improve protection of wetland resource areas and wildlife. Comments from the Town of Lynnfield and the Town of Wakefield identify the extensive amount of planning and review conducted as part of the 40R process and express strong support for the project and the ability of the project proponent to work constructively to address any outstanding issues. Comments from MassAudubon and the Saugus River Watershed Council identify issues consistent with those raised by state agencies and specifically request that a Draft and Final EIR be required, in particular to develop adequate baseline information regarding water quality and environmental resources.

I am aware of the extensive amount of planning and analysis that the proponent has completed on the local level, which is reflected in the EENF, and agree with many commentors that this project has the potential to be a good model for sustainable development; however, I am not confident that the outstanding issues that have been identified by state agencies and others can be adequately addressed through a Single EIR. Therefore, I am requiring development of a Draft and Final EIR. I note that the MEPA regulations do provide sufficient flexibility to streamline the review in the future. If the Draft EIR provides a complete and stand-alone description and analysis of the project, project alternatives and environmental impacts, and adequately addresses mitigation, the regulations allow the Draft EIR to be reviewed as a Final EIR. The proponent has expressed its intention to thoroughly address outstanding issues and to coordinate and consult closely with state agencies and other stakeholders prior to filing the EIR.

SCOPE

General

The EIR should follow the general guidance for outline and content contained in section 11.07 of the MEPA regulations, as modified by this Certificate.

Project Description

The Single EIR should include a thorough description of the entire project and all project elements and construction phases. The EIR should include an existing conditions plan illustrating resources and abutting land uses (including water supply) for the entire project area and a proposed conditions plan (or plans) illustrating proposed elevations, structures, access roads, stormwater management systems, and sewage connections associated with each phase of the project. The EIR should also include a site circulation plan illustrating how motor vehicles, pedestrians and cyclists will be accommodated on the site for each phase of the project. Plans must be provided for the entire site at a reasonable scale (e.g. 40 or 60 scale).

Project Permitting and Consistency

The EIR should briefly describe each state permit required for the project and each phase of the project and should demonstrate that the project meets applicable performance standards. In accordance with section 11.01 (3)(a) of the MEPA regulations, the EIR should discuss the consistency of the project with any applicable local or regional land use plans. The EIR should also address the requirements of Executive Order 385 (Planning for Growth) and the project's consistency with the Commonwealth's Sustainable Development Principles.

Alternatives Analysis

In addition to the Preferred Alternative for the proposed mixed-use project, the EIR should discuss an alternative site layout or layouts that will minimize impacts to wetlands, rare species and fisheries. Comment letters from NHESP, DMF, Mass Audubon and the Saugus River Watershed Council identify the need to maximize the amount of undisturbed buffer zone between project elements and Reedy Meadow and the Saugus River and further minimize the creation of impervious surfaces. Such an alternative may also create a more compact site plan and provide opportunities for improving pedestrian and bicycle access between the residential uses and commercial uses on the site. The EIR should identify any constraints to providing greater integration between these uses on the site.

Greenhouse Gases

I applaud the proponent's inclusion of a quantitative greenhouse gas (GHG) analysis that identifies the project's total emissions of carbon dioxide (CO_2) and will support EEA efforts to identify and collect data on GHG emissions associated with various types of projects. The analysis identifies GHG emissions associated with stationary source and transportation emissions. Because the project was filed prior to the introduction of the final EEA GHG Emissions Policy and Protocol, the proponent was only required to conduct a qualitative analysis of emissions. The analysis calculates total CO2 emissions by adding transportation emissions with direct and indirect stationary emissions (from on-site sources and energy use). Transportation emissions were developed through the mesoscale analysis and stationary source emissions were developed using the EQUEST model. The stationary source analysis compared the 2012 Build (a building constructed with typical building materials) and a 2012 Build with Improvements alternative that includes measures to reduce emissions through use of improved building materials and rooftop equipment. The GHG analysis indicates that the 2012 Build Condition will contribute a total of 185,044 tons per year (tpy) of CO_2 and the 2012 Build with Improvements will contribute 183,305 tpy for a total reduction of 739 tpy.

The measures identified in the EENF for reducing GHG emissions offset less than 1% of the GHG emissions generated by the project. The mixed use nature of the project will contribute to significant reductions in transportation emissions over the long run; however, the size and scale of this project provide additional opportunities for the proponent to further reduce GHG emissions. I strongly encourage the proponent to consider constructing buildings that are consistent with the Massachusetts Leadership in Energy and Environmental Design (LEED) Plus standard for new buildings, incorporate renewable energy technology (e.g solar, fuel cells, geothermal and combined heat and power) into the project design and further incorporate Low Impact Development (LID) techniques into the site design. In addition, efforts to encourage source reduction and recycling through building design and operations could have a significant impact on GHG emissions. Finally, the proponent should strengthen the Transportation Demand Management (TDM) program. These efforts can minimize the long term environmental impacts of this project while reducing operating costs. I encourage the proponent to consult with EEA staff regarding the development of a more aggressive approach for reducing GHG emissions.

Land Alteration

The project will create an additional 37 acres of new impervious surfaces for a total of 55 acres on the site. It should describe the amount of excavation and fill and include a blasting plan. It should assess the impacts from earth moving and blasting on wetlands and rare species and evaluate alternatives road and building layouts to minimize impacts. The blasting plan should identify blasting locations and provide more information on technical specifications and/or operations to avoid perchlorate contamination. The EIR investigate all feasible methods of avoiding, minimizing or mitigating impacts to land.

The EIR should evaluate alternatives that minimize the amount of impervious surfaces associated with the project. Specifically, the EIR should evaluate the feasibility of reducing overall parking ratios, and/or of providing structured parking as part of the proposed project. The EENF indicates that 103 acres of the site will be deeded to the Town of Lynnfield as open space and conservation land. This area includes the northern half of the golf course, which will be redesigned as a 9-hole golf course. A conservation restriction (CR) will be placed on 58 acres including Reedy Meadow and an associated buffer zone. The EIR should clearly identify, in the text and on project plans, the area of the project site that will remain as open space and as conservation land. It should identify who will hold the CR and include a draft of the CR language.

Transportation

As noted previously, the project is estimated to generate approximately 19,079 unadjusted average daily vehicle trips (adt) using appropriate Institute for Traffic Engineers (ITE) land use codes and 15,079 adt when adjusted for internal shared trips and pass-by trips. According to the comments received from the Executive Office of Transportation (EOT) the traffic study included in the EENF appears to conform to the EEA/EOT Guidelines for EIR/EIS Traffic Impact Assessment. The EENF indicates that the traffic analysis is fairly conservative because it does not take credit for the reduction in trips associated with removal of the conference center and a reduced golf course and analysis provided in the EENF (based on a study of 3 similar mixed-use projects) indicates that ITE trip generation estimates may overestimate traffic generation associated with a mixed-use development by 50% and greater. The EENF identifies significant issues with existing traffic capacity, identifies roadway improvements planned by others to alleviate existing conditions and identifies roadway improvements planned by the project proponent to mitigate its contribution to increased traffic volume and address longstanding congestion issues. In addition, the proponent identifies a TDM program developed to minimize single occupancy vehicle (sov) trips.

The proponent should provide a detailed response to the comments provided by EOT and provide a revised traffic analysis that includes the locations and movements identified in its comment letter (i.e. Route 1/Salem Street, Route 128/Walnut Street and Salem Street/Audubon Road). The EIR should more clearly define the details and schedule for implementation of the MassHighway improvements in relation to this project and identify how construction can be coordinated to minimize construction period impacts. The proponent should continue its coordination with Lynnfield, Wakefield and EOT during preparation of the EIR.

The EIR should include conceptual designs for the internal roadway improvements, as well as off-site improvements and discuss the suitability of any proposed signalization improvements and any roadway widening. It should discuss right-of-way (ROW) implications associated with widening and describe how such ROW's would be acquired. In addition, it should identify any wetlands and/or drainage impacts associated with off-site roadway improvements. The EIR should include any conceptual plans for roadway improvements with sufficient detail to verify the feasibility of constructing such improvements. The plans should

show proposed lane widths and offsets, layout lines and jurisdictions, and the land uses (including access drives) adjacent to areas where improvements are proposed.

The project will include construction of 2,456 new parking spaces for a total of 3,438 spaces. The EIR should identify the parking ratios associated with each aspect of the project, explain how the number of parking spaces was determined and describe how shared parking has been incorporated into the project. The EIR should demonstrate that the parking supply is the minimum necessary to accommodate project demand. It should include an assessment of parking supply and use associated with the three mixed use projects identified in the traffic analysis and provide a comparison. The EIR should identify additional alternatives for minimizing the creation of impervious surfaces associated with the parking supply including use of structured parking, locating parking under buildings and use of pervious pavement for residential parking or overflow parking.

Air Quality

In accordance with the State Implementation Plan (SIP) for ozone attainment, the proponent must conduct an indirect source review analysis because this project contains non-residential uses that generate 6,000 or more new trips per day. Comments from EOT indicate that the analysis has been conducted in accordance with DEP Guidelines for Performing Mesoscale Analysis of Indirect Sources. Because this analysis demonstrates that hydrocarbon emissions for the 2012 Build scenario (206 kilograms per year (kpd)) are greater than the 2012 No Build scenario (199.5 kpd), the proponent is required to provide appropriate mitigation including the development of a Transportation Demand Management (TDM) program. The proposed mitigation package analyzed for the Build with Mitigation scenario includes roadway improvements and demonstrates a reduction of 1 kpd, respectively from the Build scenario.

The EENF identifies a TDM program which consists primarily of identification of an on-site transportation coordinator and facilitation of bicycle and pedestrian access by providing bicycle racks and creating sidewalks within the site. Although the text in the EENF identifies pedestrian access as a major emphasis, the site layout and project plans do not reflect this priority. The EIR should include a plan that identifies existing modes including transit, walking and bicycling, within the project area and on-site, analyze existing and future conditions and provide infrastructure improvements and incentives to increase use of these modes. These improvements and incentives (e.g. bus shelters, bus turnouts, taxi areas, pedestrian/bike paths) should be clearly described and illustrated on plans. The EIR should present a strengthened Transportation Demand Management (TDM) program to further mitigate emissions of criteria pollutants and GHG and consider provision of a shuttle bus service to the Andersen Regional Transportation Center (ARTC). The EIR should describe any monitoring necessary to ensure the success of the program. Walk Boston provided thoughtful and detailed comments on the site plan and traffic flow. I encourage the proponent to consult with them regarding efforts to improve the walkability of the site.

Wetlands and Drainage

As noted previously, the project will require a 401 Water Quality Certificate from MassDEP and Orders of Conditions from the Lynnfield and Wakefield Conservation Commission. Wetland alterations are associated with the expansion of the secondary access drive. The project will alter 400 feet of bank, 1,700 sf of BVW, 2,150 sf of land under water, 16,000 sf of bordering land subject to flooding (BLSF) and 600 feet of riverfront area. In addition, it includes work and/or permanent structures within 429,700 sf of buffer zone. The stormwater management plan includes the use of rain gardens, vegetated swales and a dispersed system that is intended to maintain and mimic existing hydrologic functions.

The EIR should include plans that illustrate most recently approved delineation of all applicable resource area boundaries including riverfront areas, buffer zones, 100-year flood elevations, priority and/or estimated habitat, wetland replication areas, water supply and waterways. The EIR should quantify the project's estimated impact on each resource area, including impacts associated with the proposed stormwater outfalls and with proposed water transportation. It should describe the nature of all impacts that cannot be avoided including grading, clearing and construction-related disturbances and whether they are temporary or permanent in nature. The EIR should confirm that all feasible methods to reduce impervious surfaces, including parking supply/design and narrow roadway widths, have been explored.

Comments on the EENF identify concerns with the accuracy of the analysis of the stormwater management system and identify several issues that should be addressed in the EIR. The EIR should include a revised stormwater management plan that adequately addresses the stormwater comments and demonstrate that source controls, pollution prevention measures, erosion and sediment controls and the drainage system will comply with the MassDEP Stormwater Management Policy and standards for water quality and quantity both during construction and post-development. The EIR should identify the quantity and quality of flows and design a system that can approximate current rates. The rates of stormwater runoff should be analyzed for the 10, 25, and 100-year storm events. Also, it should identify how it is consistent with the City of Lynnfield's NPDES Phase II Stormwater Management Plan (SMP). The EIR should include an operations and management plan to ensure the long-term effectiveness of the stormwater management system. The locations of detention basins, distances from wetland resource areas and the expected quality of the effluent from the basins should be identified. A copy of the Stormwater Pollution Prevention Plan (SWPPP) should be included in the EIR.

The EIR should analyze impacts associated with the proposed stormwater discharges to Reedy Meadow and the Saugus River, including impacts on water quality and temperature. It should indicate whether the project includes a discharge to Hawkes Pond, which is an Outstanding Resource Water (ORW) and demonstrate that the critical areas standard can be met. In addition, the EIR should further consider how Low Impact Development (LID) techniques, such as disconnecting runoff flow pathways and minimizing clearing and grading, can be incorporated into the project design.

The EIR should include an assessment of wildlife and fisheries habitat including evaluation of existing hydrology studies, fish monitoring programs and water quality analysis conducted by others. As noted previously, the EIR should include analysis of an alternative site plan that will minimize impacts to wetlands, rare species and fisheries (as outlined in comments below). The EIR should provide more detail on proposed road widening and fill in Reedy Meadow and other wetland impacts including an analysis of alternatives that could avoid minimize and mitigate wetlands impact. It should include additional detailed information on how undeveloped areas, including wetland buffers, will be enhanced, managed and protected. It must include a detailed wetlands restoration plan (and identify it on project plans) and demonstrate that it will meet regulatory standards and adequately mitigate the loss of BVW and flood storage.

Rare Species and Wildlife Habitat

As noticed previously, the site contains habitat for rare species and important fisheries. Comments from Mass Audubon indicate that the Reedy Meadow has been designated as an Important Birds Area (IBA) due to its outstanding habitat value for a wide variety of birds. NHESP comments indicate that wetlands provide necessary cover and food resources for survival of rare species. It indicates that these species are sensitive to auditory and visual disruptions, particularly in spring and summer during breeding and nesting. In addition, alterations to marsh hydrology and water quality can impact the habitat necessary for successful nesting and feeding and allow establishment of non-native invasive plant species. These comments also identify significant concern with the project as proposed, including grading and construction activities and creation of impervious surfaces within a significant length of the buffer zone to wetlands. In addition, they note a significant decrease in the peak runoff rate and peak volume at four of the six stormwater design points and auditory disturbance posed by blasting and on-site rock crushing activities during construction. NHESP indicates that the proponent should consult with it regarding protocols for field surveys of state-listed marsh birds, that the proposed development within the mapped Priority Habitat adjacent to Reedy Meadow should be reduced and that the stormwater management plan should be revised to more closely match the existing pre- and post-development rates.

Comments from DMF describe efforts by its agency, the Saugus River Watershed Council and the Lynn Water and Sewer Commission to restore eels and river herring to Reedy Meadow. A key element of this effort is to reduce stormwater pollution and improve degraded habitat. DMF comments identify the need for more information on impacts to Reedy Meadow and mitigation for those impacts consistent with comments from other resource agencies. In addition, these comments indicate that in-water silt producing work should be prohibited from February 15 through June 30 and that adequate fish passage should be maintained until October 15th to protect migration of eels.

The EIR should include the results of field surveys conducted consistent with NHEPS protocols, address how the project can contribute towards improved habitat and address DMF and NHESP comments on mitigation.

Water Supply

The EENF indicates that the project will use approximately 122,010 gpd of water. Water service will be provided by Wakefield and Lynnfield, both of which are members of the MWRA water service area. The proponent has indicated that water conservation measures will be incorporated into the project design as part of an overall effort to construct sustainable buildings. The EIR should describe proposed water conservation measures and analyze their potential to reduce total water demand (and associated wastewater generation). As noted previously, if on-site discharge is proposed, the proponent should evaluate re-use of gray water.

The site contains irrigation wells associated with the existing golf course. These wells may be retained and used for irrigation of landscaping. The EIR should identify which wells will be retained and estimate the associated amount of water withdrawal.

Wastewater

As described in the EENF, the project will increase wastewater flow by 73,770 gpd for a total of 122,010 gpd of wastewater flow. Most of the wastewater from the site is discharged to Wakefield's municipal wastewater collection system for ultimate treatment and discharge at Deer Island. A small portion of its wastewater is treated through an on-site septic system. The EENF proposes to discharge increased wastewater flows to the Wakefield municipal collection system. It indicates that preliminary geotechnical investigation indicate that groundwater discharge is a possibility if discharge to the municipal system is not permitted.

Because Lynnfield is not a member of the MWRA sewer service area, this discharge was allowed through the development of an agreement between Wakefield, Lynnfield and the Department of Conservation and Recreation (DCR). Comments from the MWRA indicate that this agreement does not contemplate the magnitude of flows currently proposed or the nature of the proposed development. Also, these comments identify significant concern with the addition of wastewater to the MWRA system from the re-development related to the severe constraints of the system downstream of the connection with Wakefield due to wet weather inflow. These constraints have resulted in subcharging and overflow of the system in downstream communities such as Melrose. MWRA indicates that the project does not appear to comply with the conditions identified in its policy for admitting new communities to the MWRA system or approving sewer service to other locations outside of the MWRA sewer service area. These conditions include the following: a) any expansion of the system shall strive for no negative impact on the existing sewer system communities and b) the proposed flows will not result in surcharging or other overflows in the MWRA transport system.

The EIR should include additional analysis of options for wastewater collection, treatment and discharge including on-site groundwater discharge, discharge to the Wakefield collection system and discharge to the Saugus collection system. For each alternative, the EIR should identify preliminary design of the infrastructure, associated constraints and measures to mitigate associated impacts.

The EIR should include adequate technical information and analysis to demonstrate the feasibility of a groundwater discharge system and ensure that consistency with regulatory standards can be addressed during MEPA review, including adequate separation between leaching fields and wetland resource areas and stormwater infiltration beds. The EIR should identify potential sites for the treatment facility and leaching fields, include a hydrogeologic report, a wastewater time of travel study, demonstrate that representative sampling of the site has been conducted, include a map of test pit and boring locations and include soil logs. Design of an on-site system creates the potential for re-use of gray water and the proponent should consider its incorporation into the project design (consistent with MassDEP's January 3, 2000 *Interim Guidelines on Reclaimed Water (Revised)).* The proponent should consult with MassDEP to develop a protocol for the groundwater report and the report should be developed consistent with this protocol.

For the sewer collection system alternatives, the EIR must include documentation from the municipality that the proposed alternative is feasible and that adequate capacity is available to accommodate the proposed project's additional wastewater flows. It should identify whether a Comprehensive Wastewater Management Plan (CWMP) has been completed by the municipality and whether any associated MEPA filings, such as a Notice of Project Change (NPC), are required consistent with review of the CWMP. It should identify specific measures to reduce extraneous clean water (infiltration and inflow (I/I)) from the system and identify the ratio for establishing the amount of I/I reductions. For the Wakefield alternative, it must demonstrate that the standards identified by the MWRA can be achieved. Because water needs will be met by the MWRA, it does not appear that discharge of wastewater to the MWRA system would constitute an interbasin transfer; however, the EIR should clarify this issue.

Contaminated Soils

Comments from MassDEP indicate that there is an identified contamination site on the property (Release Tracking Number 3-26555). These comments indicate that the site is classified under the Massachusetts Contingency Plan (MCP)/21E regulations as Response Action Outcome (RAO) Class B-1 which indicates that no Activity and Use Limitation is necessary because No Significant Risk exists at the site.

The EIR should provide additional information regarding the contamination site, identify it on project plans, and assess whether project changes (including stormwater discharge and/or an on-site wastewater discharge to groundwater) could result in migration of contaminants.

Construction Period

The project has potentially significant construction impacts, including extensive earth moving and likely blasting. The EIR should evaluate construction period impacts, impacts to vegetation, potential impacts from erosion and sedimentation, traffic impacts on adjacent roadways. The EENF indicates that the proponent will seek to engage a contractor that is participating in the MassDEP Diesel Retrofit Program to minimize construction related air quality impacts. I encourage the proponent to require participation in its bid documents, including te use of diesel oxidation catalysts or diesel particulate filters and use of on-road ultra low sulfur diesel (ULSD) fuel.

Mitigation

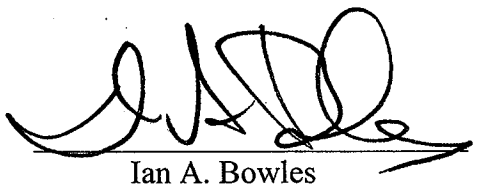
The EIR should include a separate chapter on mitigation measures. It should include a Draft Section 61 Finding for all state permits that includes a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation, and the identification of the parties responsible for implementing the mitigation. A schedule for the implementation of mitigation, based on the construction phases of the project, should also be included.

Response to Comments

The EIR should contain a copy of this Certificate and a copy of each comment received. The EIR should respond to the comments received to the extent that the comments are within MEPA jurisdiction. I recommend that the proponent use either an indexed response to comments format, or else direct narrative response. The EIR should present any additional narrative or analysis necessary to respond to the comments received.

Circulation

The EIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should be sent to any state agencies from which the proponent will seek permits or approvals, to the list of "comments received" below, and to Lynnfield and Wakefield officials. A copy of the EIR should be made available for review at the Lynnfield and Wakefield public library.



October 24, 2007
Date

Ian A. Bowles

Comments Received:

10/10/07	Department of Environmental Protection/Northeast Regional Office (MassDEP/NERO)
10/15/07	MassDEP/NERO (comment addendum)
10/10/07	Division of Marine Fisheries (DMF)
10/09/07	Division of Fisheries and Wildlife/Natural Heritage and Endangered Species Program (DFW/NHESP)
10/10/07	Executive Office of Transportation (EOT)
10/10/07	Town of Lynnfield/Board of Selectmen
10/5/07	Town of Wakefield/Board of Selectmen
10/3/07	Lynnfield Initiatives for Elders, Inc. (LIFE)
10/10/07	MassAudubon
10/10/07	Saugus River Watershed Council
10/10/07	Walk Boston
10/8/07	Lawrence Soucie

IAB/CDB/cdb

AC

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
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DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

October 10, 2007

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Lynnfield
Meadow Walk at Lynnfield
Walnut Street
EEA # 14096

Attn: MEPA Unit

Dear Secretary Bowles:

The Department of Environmental Protection has reviewed the Expanded Environmental Notification Form (EENF) submitted by PHF-ND Colonial, LLC c/o National Development for a mixed-use development comprised of approximately 395,000 sf of retail, 80,000 sf of office, and 220 housing units with parking for 3,438 vehicles on a 203 acre site in Lynnfield (EEA# 14096). The project increases the existing site development by 718,200 square feet. This project is categorically included for the preparation of an environmental impact report (EIR) and the proponent is requesting a single EIR for this 1,024,200 square foot project. The Department provides the following comments.

Section 61 Finding

The Department requests that the Draft EIR include a Section 61 Finding that describes and lists those measures to avoid, minimize, and mitigate environmental impacts from the project that relate to the MassDEP permits. The Finding also should identify the parties responsible for implementing these measures, and an approximate schedule for completing the work after the environment is impacted.

Wetlands

According to the EENF, the project would alter 400 feet of bank, 1,700 sf of bordering vegetated wetlands, 2,150 square feet of land under water, 16,000 sf of bordering land subject to flooding, and 600 feet of riverfront. Direct impacts are proposed due to widening of an existing roadway, which depicted by a comparison of Figure 3.1 and 3.2. The EENF indicates that this roadway is located north of the hotel. However, from the figures, the roadway to the east of the hotel appears to be widened, impacting Wetland C. The extent of the proposed impact should be

clarified, and other planned impacts to wetland resource areas should be described and depicted on plans in the EIR. In addition, alteration to wetland buffer zone is estimated to be 429,700 sf. The EENF indicates that the performance standards of the wetlands regulations for alteration of these resource areas will be met with a replacement wetland.

An assessment of wildlife/fisheries habitat is being prepared to identify any additional wetlands functions that would need to be replicated. The EIR should explain the wildlife/fisheries habitat evaluation in greater detail, provide the results, and expand on the description of the replacement wetland to demonstrate that the performance standards in the wetlands regulations would be satisfied. The wetlands replication/mitigation should be consistent with the BVW performance standards in 310 CMR 10.55(4), and the design for the replication be based upon the MassDEP *Massachusetts Inland Wetland Replication Guidelines*, March 2002. The EIR also should provide information on the compensatory flood storage to demonstrate that it would conform to the performance standards in the wetlands regulations. Plans showing the wetlands replacement and compensation areas should be at a readable scale.

401 Water Quality Certification

It is acknowledged in the EENF that a 401 Water Quality Certification will be required for the real estate subdivision proposed. 401 Water Quality Certificates (401 WQC) are needed for residential subdivisions, unless deed restrictions are recorded for each lot to ensure that there will be no further alteration of wetlands on site. In accordance with 314 CMR 9.04 (3), "Any discharge of dredged or fill material associated with the creation of a real estate subdivision, unless there is a recorded deed restriction providing notice to subsequent purchasers limiting the amount of fill for the single and complete project to less than 5,000 square feet cumulatively of bordering and isolated vegetated wetlands and land under water, and the discharge is not to an Outstanding Resource Water." The EIR should explain how the project would comply with these 401 WQC regulations. Because Hawkes Pond is an Outstanding Resource Water (ORW), if there would be a stormwater discharge from the subdivision to this water body, a 401 WQC would be required, irrespective of deed restrictions.

A 401 Water Quality Certificate requires evaluation of alternatives. Information in the EIR on alternatives that consider measures to avoid, minimize, and mitigate wetlands impacts will be considered by MassDEP in permitting.

Stormwater

Wetland resource areas are protected from adverse water quality, flooding, and erosion impacts caused by stormwater runoff during construction and post-construction, under the provisions in the MassDEP Stormwater Management Policy (SMP). Revisions to the SMP will be incorporated into the wetlands and 401 Water Quality Certification regulations on January 2, 2008. Therefore, the proponent should be aware of changes in stormwater control requirements that will affect projects seeking approval after that date.

The Outstanding Resource Waters (ORW) abutting the site need to be protected from adverse water quality, flooding, and erosion impacts caused by stormwater runoff during construction and post-construction, under the provisions in the MassDEP Stormwater Management Policy (SMP). From the drainage report, it appears that the 4.37-acre drainage area,

which includes the access road, parking and landscaping would discharge toward Wetland C, which is considered to be ORW. The EENF acknowledges that stormwater management systems in this drainage area would need to comply with the Critical Area standard, as well as the other applicable standards for compliance with the SMP. Municipalities such as Lynnfield also are required to prepare and implement Stormwater Management Programs for compliance with the NPDES Phase II Stormwater General Permit. The EIR should demonstrate that source controls, pollution prevention measures, erosion and sediment controls during construction, and the post-development drainage system will be designed to comply with the SMP and standards for water quality and quantity impacts and for consistency with the town of Lynnfield's Storm Water Program.

The Department requests that the EIR provide revised total suspended solids (TSS) calculations. The TSS calculations for Discharge Point DP-1, DP-3, DP-4, and DP-5 (Volume 3, Drainage Report), take 25 percent removal credit for the sediment forebay and 70 percent for the detention pond. These calculations need to be redone for consistency with the SMP, which requires that a detention basin include a sediment forebay in order to be given a 70 percent credit for TSS removal.

The EIR should provide specifications and supporting information on the proposed sizing and removal efficiency for the particle separators proposed to explain why 80 percent TSS removal was used in the TSS removal calculations. Proprietary system efficiency information outlined in the Stormwater Management Policy Handbook, Volume II, Appendix D, should substantiate the TSS removal claims used in the removal calculations. In addition, the Stormwater Technology Clearinghouse, a website maintained by UMass with funding support from MassDEP/USEPA at http://www.mastep.net/, provides information on stormwater technology studies that are available to evaluate a manufacturer's efficiency claims about these systems.

The EIR should explain the recharge volume of 164,925 cubic feet that is proposed to be provided from the calculations in Volume 3, Appendix G. Within that volume are Ponds 1B, 1D, and 3A, which are not expected to infiltrate stormwater, according to a letter from SHA to Danielle Spicer at Stantec, dated August 29, 2007.

Low Impact Development

Currently, about 18 acres of the site are impervious and about 55 acres or about 27 percent of the site will be pavement or covered with buildings. The Department requests that the proponent consider alternatives that would reduce the increase in imperviousness to a minimum. Reducing imperviousness is one of the most important low impact development (LID) measures, which is effective in reducing the volume of runoff requiring treatment and control. The Department appreciates the proponent's inclusion of rain gardens, vegetated swales, and a dispersed stormwater management that would help to maintain and mimicking existing hydrologic functions. As the stormwater system design is refined through the EIR review, the Department requests further consideration of LID site design techniques, such as disconnecting runoff flow pathways and dispersing stormwater control across the site, and minimizing clearing and grading while preserving natural resources and drainage patterns. When combined with

pollution prevention measures, LID can be less costly than conventional gutter and pipe drainage system and can provide redundancy for stormwater control.

Wastewater

The EENF states that there is sufficient capacity in the existing collection system to accommodate the estimated 76,350[1] gpd of new wastewater flow from the Meadow Walk at Lynnfield project. At full development, wastewater from the existing and proposed development would generate about 122,010 gpd of wastewater. Wastewater generated by the project is proposed to be discharge into the town of Wakefield sewer system, which flows into the MWRA system and ultimately to the Deer Island Wastewater Treatment Facility.

MassDEP, in cooperation with MWRA and its member communities (including Boston), are implementing a flow control program in the MWRA regional wastewater system, to remove extraneous clean water (e.g., infiltration/ inflow (I/I)) from the system. Routinely, MassDEP is requiring proponents that are adding significant new wastewater flow, (such as the Meadow Walk at Lynnfield project), to assist in the I/I reduction effort and to ensure that the additional wastewater flows are offset by the removal of I/I.

Currently, MassDEP is using a minimum 4:1 ratio for I/I removal to new wastewater flow added. This ratio may be increased if specific flow constrictions/overflows already exist in the sewershed to which the new flow is added. The proponent should therefore work with the town of Wakefield, and consult with MassDEP on this issue. Assuming that a 4:1 ratio is utilized, the proponent will need to remove, or cause to be removed, 305,400 gpd of I/I.

Although the proponent is negotiating with the town of Wakefield to connect to the municipal sewer system, the EENF indicates that geotechnical testing is being conducted for an on-site system, until the agreement is finalized with the town of Wakefield. Should the proponent decide to proceed with onsite treatment, MassDEP recommends that the proponent contact the Northeast Regional Office, Municipal Services and Wastewater Management for a pre-permit meeting to discuss permitting requirements, coordination of field-testing, hydrogeologic investigations, and legal reviews. Information requested at the pre-permit meeting, such as permit requirements, alternative siting of the on-site system and leaching fields, and modeling information and results of a wastewater time of travel study to water supply and wetlands resources also should be included in the scope for the EIR, where applicable, if an onsite system is proposed.

Construction Period Air Quality

MassDEP recommends that the project proponent participate in the MassDEP Diesel Retrofit Program to mitigate the construction-period impacts of diesel emissions to the maximum extent feasible. Diesel emissions contain fine particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), which has been found to exacerbate a number of heath conditions, such as asthma and respiratory ailments. $PM_{2.5}$ also contributes to lung damage and has been identified as a likely carcinogen.

[1] This number is slightly higher than the number in the EENF because the onsite septic system is not considered an existing wastewater discharge, for the purposes of I/I calculation because it does not discharge to the sewer system.

MassDEP staffs are available to work with the project proponent to implement construction-period diesel emission mitigation, which could include the installation of after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). For more information on these technologies, see: http://www.epa.gov/otaq/retrofit/verif-list.htm.

In addition, MassDEP reminds the project proponent that off-road equipment engines must use low sulfur diesel (LSD) fuel as of July 2007, as required by a 2004 regulation issued by the U.S. Environmental Protection Agency. On-road LSD fuel has a sulfur content of approximately 500 parts per million (ppm) in contrast to the 3,000 ppm sulfur level of current off-road diesel fuel. The use of LSD fuel, in conjunction with after-engine emission controls, can reduce $PM_{2.5}$ by an additional 25 percent beyond that obtainable with after-engine controls only. Project proponents may also use on-road ultra low sulfur diesel (ULSD) fuel, which has a sulfur content of 15 ppm.

Massachusetts Contingency Plan (MCP)/21E

There is an identified contamination site on the property, Release Tracking Number (RTN) # 3-26555, which has been classified under the MCP/21E regulations as Response Action Outcome (RAO) Class B-1, as of September 19, 2007. This classification identifies sites where remedial actions have not been conducted and no Activity and Use Limitation is necessary because No Significant Risk exists at the site.

Recycling

Waste reduction, recycling, and integrating recycled materials into the project are necessary to minimize or mitigate the long-term solid waste impacts of this mixed-use development. The Commonwealth's waste diversion strategy is part of an integrated solid waste management plan, contained in The Solid Waste Master Plan that places a priority on source reduction and recycling. Efforts to reduce waste generation and promote recycling have yielded significant environmental and economic benefits to Massachusetts' residents, businesses and municipal governments over the last ten years. Waste diversion will become even more important in the future as the key means to conserve the state's declining supply of disposal capacity and stabilize waste disposal costs.

For a project of this magnitude, it is important for the proponent to be specific in defining the waste management goals in contractor and subcontractor agreements. Documentation also should be provided by these contractors to verify waste reuse, recycling, and disposal plans are as proposed in the waste management plan for the project.

As the lead state agencies responsible for helping the Commonwealth achieve its waste diversion goals, DEP and EOEA have strongly supported voluntary initiatives by the private sector to institutionalize source reduction and recycling into their operations. Adapting the design, infrastructure, and contractual requirements necessary to incorporate reduction, recycling and recycled products into existing large-scale developments has presented significant challenges to recycling proponents. Integrating those components into developments such as the Ridgecrest Residential development at the planning and design stage enable the project's management and occupants to establish and maintain effective waste diversion programs. Additional information

on developing successful waste management programs is available at the following DEP website: http://www.mass.gov/dep/recycle/files/cdhome.htm.

The Department also encourages the proponent to use products from recycled materials for structural elements, equipment, and furnishings, (e.g., wall and floor coverings). The proponent also should promote efforts among building management, tenants, suppliers, and contractors to increase their use of products with recycled content. The MassDEP website also includes information on recycled material availability and sources.

By incorporating recycling and source reduction into the design, the proponents would have the opportunity to join a national movement toward sustainable design. Sustainable design was endorsed in 1993 by the American Institute of Architects with the signing of its *Declaration of Interdependence for a Sustainable Future.* The project proponent should be aware there are several organizations that provide additional information and technical assistance, including WasteCap, the Chelsea Center for Recycling and Economic Development, and MassRecycle.

In 2004, Massachusetts generated a total of 13.93 million tons of waste, including 8.72 million tons of residential and commercial waste and 5.16 million tons of construction and demolition waste (C&D). On average, this rate equates to each person in Massachusetts generating approximately 1.3 tons of waste a year, according to the MassDEP website: http://www.mass.gov/dep/recycle/priorities/dswmpu01.htm - recycling.

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Jack Zajac (978) 694-3240 for further information on the wastewater issues. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Kevin Brander, Jack Zajac, Criss Stephens, Jill Provencal, MassDEP-NERO,
Town of Lynnfield, Conservation Commission, Town of Wakefield, Conservation Commission

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
205B Lowell Street, Wilmington, MA 01887 • (978) 694-3200

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

October 15, 2007

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Lynnfield
Meadow Walk at Lynnfield
EEA # 14096

Attn: MEPA Unit

Dear Secretary Bowles:

The Department of Environmental Protection provides the following addendum to its comment, dated October 10, 2007 on the the Expanded Environmental Notification Form (EENF) submitted by PHF-ND Colonial, LLC c/o National Development for a mixed-use development comprised of approximately 395,000 sf of retail, 80,000 sf of office, and 220 housing units with parking for 3,438 vehicles on a 203 acre site in Lynnfield (EEA# 14096). The project increases the existing site development by 718,200 square feet. This project is categorically included for the preparation of an environmental impact report (EIR) and the proponent is requesting a single EIR for this 1,024,200 square foot project.

Air Quality

Summary of VOC and NOX Analysis

The EENF contains an air quality mesoscale analysis of VOC and NOX emissions from mobile sources. The results of the analysis show increases in VOC and NOX emissions with the Build Condition compared to the No Build Condition.The proposed mitigation package analyzed for the Build with Mitigation Condition includes roadway-based improvements. The roadway improvements will provide a slight reduction in predicted emissions increases.

Recommendations

The mesoscale analysis does not quantify the emission reductions from any transportation demand management (TDM) measures. However, the project does commit to two specific TDM measures: appointing a TDM coordinator, and facilitating bicycle and pedestrian measures by providing bicycle racks and incorporating sidewalks within the site, respectively. Coordination with town officials also should include off-site bicycling route planning. In addition, a list of several other excellent TDM measures is provided, but no commitment is made other than encouraging tenant employers to implement these measures when appropriate. A greater

commitment between the project and employer tenants to an expanded TDM program should be proposed. As an added measure, MassDEP also recommends a project commitment of support, and funding as necessary, to a shuttle service linking the project with the Anderson Regional Transportation Center. These recommendations also would reduce CO_2 emissions as discussed below.

Summary of GHG Analysis

The EENF contains an analysis of the project's greenhouse gas (GHG) emissions. The proponent performed the GHG analysis pursuant to the MEPA Certificate dated May 11, 2007 and the *Draft MEPA Greenhouse Gas Emissions Policy and Protocol*, dated July 11, 2007. This project is one of the first projects to conduct a GHG analysis under the Draft MEPA Policy.

The GHG analysis calculates the project's carbon dioxide (CO_2) emissions from stationary and mobile sources. Total CO_2 emissions were determined by combining the emissions from the mesoscale analysis of mobile source CO_2 emissions with stationary source CO_2 emissions. The stationary source emissions include both direct (on-site energy consumption) and indirect, (off-site energy), building sources, (e.g., for electricity, district heating).

Mobile source CO_2 emissions were calculated following similar procedures used for the mesoscale analysis of VOC and NOX emissions. CO_2 emission rates were developed using EPA's Mobile 6.2 emissions model with Massachusetts' specific model inputs and conditions. The GHG analysis also uses the same traffic data on speeds, flow characteristics, and roadway capacity, but used yearly traffic volumes for weekdays and weekends instead of the daily peak and off-peak summer volumes typically used in VOC and NOX mesoscale analyses. The mobile source analysis was conducted for four conditions: 2007 Existing, 2012 Build, No Build, and Build with Improvements.

Direct, (onsite energy consumption), and indirect, (offsite energy generation), stationary sources of CO_2 emissions were calculated using the EQUEST model, which is one of several energy use models considered appropriate for this purpose according to Draft MEPA GHG Emissions Policy. Emission calculations were performed for two scenarios: 1) use of typical building materials for the 2012 Build condition, and 2) use of certain improved building materials for the Build with Improvements condition. The stationary source analysis was conducted for 2012 Build and Build with Improvements. Unlike the mobile source analysis, it did not include the 2007 Existing condition or the 2012 No Build condition as a baseline for comparison. These omission are discussed below, and they should be addressed fully in the EIR.

Results of Mitigation

Mobile Sources

The mitigation of CO_2 emissions from mobile sources relies on the same measures proposed to reduce the VOC and NOX emission impacts. The EENF reports that the proposed roadway/signal improvements account for CO_2 emissions reductions from project-induced mobile sources. Even with the implementation of these measures, CO_2 emissions are predicted to increase by 5,430 tpy in the 2012 Build with Improvements condition compared to the 2012 No Build condition, (Table 7.3). This result contradicts the assertion on page 7-10 that CO_2

emissions would decrease by almost 160 tpy in the 2012 Build with Improvement condition as compared to the 2012 No Build condition. The discrepancy is significant and should be corrected and documented in the Environmental Impact Report (EIR).

Stationary Sources

Indirect Emissions

The EENF contains no information on the opportunities to avoid, minimize, or mitigate *indirect* impacts. More consideration should be given to other offset measures, such as a commitment to purchasing electricity generated from renewable energy sources or generating renewable energy on-site.

Direct Emissions

The mitigation of *direct* CO_2 emission sources included in the 2012 Build with Improvements relies on a number of sustainable design elements including several suggested mitigation measures listed in the Draft MEPA GHG Emissions Policy. Although no definition of "typical building materials" associated with the Build condition is provided, the presumption is that the proposed sustainable design elements, including improved building materials and rooftop equipment, will yield the calculated CO_2 emission reductions.

Similar to the mobile source emissions reporting discussed above, there also is an apparent contradiction between data comparing future stationary source emissions reported in the text on p. 7-11 and data from the GHG analysis results contained on Table 7-3. In addition to these discrepancies, Table 7.3 omits important data necessary to assess CO_2 impacts. These issues are described below.

Table 7.3, which compares 2012 Build With Improvements condition to the 2012 Build indicates almost 580 tpy CO_2 reduction associated with the Project's 2012 Build with Improvements condition. This is acceptable; however, the text on page 7-11 compares stationary source emissions of the 2012 Build with Improvements condition to the 2012 No Build condition and reports a 580 tpy CO_2 reduction associated with the project. This is not possible because the GHG analysis did not analyze a 2012 No Build condition for stationary sources.

Table 7.3 also describes the 2007 Existing condition and the 2012 No Build condition emissions data as N/A (not applicable). MassDEP disagrees that these baseline conditions are not applicable. Without the 2012 No Build baseline information, it is not possible to compare the project's actual CO_2 emission impacts.

Recommendations

Draft MEPA GHG Policy's seeks reasonably accurate quantitative analysis of CO_2 emissions from applicable projects. The policy then directs project proponents to complete GHG analyses to evaluate alternatives that avoid, minimize, and mitigate CO_2 impacts and ensure that project proponents have taken all feasible means and measures to reduce those impacts. The policy is not intended to create a numeric emission target.

Despite a reasonable effort to reduce mobile sources GHG emissions, the project still results in an increase in CO_2 emissions of 5,430 tpy when compared with the 2012 No Build condition. As discussed in the summary of the VOC and NOX analysis above, MassDEP recommends that additional TDM measures be implemented to further reduce mobile source CO_2 emissions. MassDEP also recommends consideration of additional sustainable design principles such as those suggested by Draft MEPA's GHG Policy. Regardless of the presumed benefits of sustainable design principals proposed as mitigation of direct stationary sources, the GHG analysis does not provide any baseline information of Existing or future No Build conditions. As stated above, without the 2012 No Build baseline information, it is not possible to assess the project's actual CO_2 emission impacts. MassDEP believes this baseline information is relevant and recommends the proponent provide this No Build baseline information. Once this additional information is provided, the proponent should consider additional measures that could avoid, mitigate or offset the difference in a revised 2012 Build with Improvements.

Absent any information relative to indirect or off-site CO_2 emissions, the proponent should consider offset measures such as a commitment to support state or municipal climate action activities or other offset measures described in the Draft MEPA GHG Policy and Protocol to address off-site CO_2 reduction measures. The EIR should further explore these and other additional opportunities to avoid, minimize, or mitigate *indirect* impacts including a commitment to purchasing electricity generated from renewable energy sources or generating renewable energy on-site.

MassDEP recommends that all air quality mitigation commitments identified in the EENF, those additionally recommended by MassDEP herein, and new measures proposed in the EIR be incorporated into Section 61 Findings, which should be included in the EIR.

The MassDEP appreciates the opportunity to expand upon the original comment on this proposed project. Please contact Jerome Grafe at (617) 292-5708 for questions on air quality in this comment. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Richard Blanchet, Jerome Grafe, MassDEP-Boston
Kevin Brander, Jack Zajac, Criss Stephens, Jill Provencal, MassDEP-NERO,
Town of Lynnfield, Conservation Commission, Town of Wakefield, Conservation Commission

AC

Commonwealth of Massachusetts

Division of Marine Fisheries

251 Causeway Street • Suite 400
Boston, MA 02114
(617) 626-1520
fax (617) 626-1509

Paul J. Diodati
Director

October 10, 2007

Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office,
Anne Canaday, EOEA#14096
100 Cambridge Street
Boston, MA 02114-2150

Dear Secretary Bowles:

The Division of Marine Fisheries (*MarineFisheries*) has reviewed the Environmental Notification Form submitted by PHF-ND Colonial, LLC c/o National Development, for a mixed use retail, office and residential development in Lynnfield and Wakefield, MA. The project is proposed on 77 acres of land currently in use as a golf course and accessory buildings. We offer the following comments with respect to the project's potential impacts to marine fisheries resources and habitats.

The project site borders on and proposes fill in the Saugus River and Reedy Meadow. This portion of the Saugus River provides important habitat for the passage of American eel (*Anguilla rostrata*). This year the Saugus River Dam eel ramp passed approximately 9,000 eels in three months (DMF monitoring data, unpublished). The Saugus River Dam is the site of an ongoing effort lead by the Saugus River Watershed Council in partnership with *MarineFisheries* and the Lynn Water and Sewer Commission to restore eels and eventually river herring to Reedy Meadow. A key element in the restoration effort is to work toward reducing impacts such as stormwater pollution, in order to improve degraded habitat. Downstream of the dam, at the Saugus River Iron works historic site, is the only portion of the Saugus River that currently supports riffle habitat for spawning rainbow smelt (*Osmerus mordax*). The Saugus River also provides important habitat for the passage, spawning and juvenile development of river herring (*Alosa pseudoharengus* and *Alosa aestivalis*).

MarineFisheries has the following comments, questions and recommendations, should this project go forward:

- In-water silt producing work should be prohibited from February 15th through June 30th in order to protect passage, spawning, and juvenile development of river herring, rainbow smelt and American eel. Adequate fish passage must also be maintained during this period and until October 15th, to protect migration of eels.

- More detail is needed on the proposed road widening and fill in Reedy Meadow, including design plans of the road and culvert. Information is needed to ensure that the proposed road widening will not limit fish passage or water flow to Reedy Meadow.

- We recommend that the applicant minimize the amount of impervious surface proposed, perhaps with the use of innovative stormwater management techniques such as vegetated

over-flow parking lots or pervious pavement designs. Stormwater management BMP's should be tailored to the specific site requirements and site inputs. BMPs should include both stormwater infiltration and filtration.

- We recommend that vegetated buffer zones separating the development from Reedy Meadow and the Saugus River be improved and maintained with native plantings.

- Sedimentation and erosion controls should be strictly monitored and maintained during construction to prevent impacts to adjacent habitats.

Thank you for the opportunity to comment on this proposal. If you have any questions regarding these comments, please contact Tay Evans at our Gloucester office at (978) 282-0803 x 168.

Sincerely,

Paul J. Diodati
Director

CC:

Ed Reiner, EPA
Chris Boelke, NMFS
Mary Griffin, DFG
Brad Chase & Matt Ayer, DMF
Joan LeBlanc, Saugus River Watershed Council

AC

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

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OCT 11 2007

MEPA

October 9, 2007

Ian Bowles, Secretary
Executive Office of Environmental Affairs
Attention: MEPA Office
Anne Canaday
100 Cambridge St.
Boston, Massachusetts 02114

Project Name:	***Meadow Walk at Lynnfield***
Proponent:	*PHG-ND Colonial, LLC c/o National Development*
Location:	*Walnut Street (Lynnfield) & Audubon Road (Wakefield), Sheraton Golf Course*
Document Reviewed:	*Expanded Environmental Notification Form (EENF)*
EOEEA/NHESP Nos.	*14096/**06-19546***

Dear Secretary Bowles,

The Natural Heritage & Endangered Species Program (NHESP) of the MA Division of Fisheries & Wildlife has reviewed the *EENF* for the 40R Planned Village Development District zoning bylaw entitled Meadow Walk at Lynnfield and would like to offer the following comments regarding impacts to state-listed species. This project is located within *Priority* and *Estimated Habitats of Rare Species* (PH 838, EH 215) as indicated in the 12th Edition of the Massachusetts Natural Heritage Atlas.

Based on a review of the information that was provided and the information that is currently contained in our database, the NHESP has determined that this project occurs within and immediately adjacent to habitat for the following state-listed species:

Scientific Name	*Common Name*	*Taxonomic Group*	*Status*
Botaurus lentiginosus	American Bittern	Vertebrate Animal: Bird	Endangered
Gallinula chloropus	Common Moorhen	Vertebrate Animal: Bird	Special Concern
Rallus elegans	King Rail	Vertebrate Animal: Bird	Threatened

These species and their habitat are protected pursuant to the Massachusetts Endangered Species Act (MESA, MGL c131A) and its implementing regulations (321 CMR 10.00).

Reedy Meadow is documented as habitat for the three state-listed species listed above. These marsh birds nest in wetlands which then provide the necessary cover and food resources for survival. They are sensitive to auditory and visual disruptions, particularly in spring and summer during breeding and nesting. Alterations to the marsh hydrology and water quality can impact the habitats necessary for successful nesting and feeding and allow for establishment of non-native invasive plant species.

The NHESP is concerned about the project as currently proposed. The filing indicates that significant work is proposed to occur very close to Reedy Meadow. Figure 3.2 and other figures show grading and other work as close as 25-feet to the wetland and introduction of impervious surfaces within 50-feet of the wetland over a significant length of the interface with Reedy Meadow. In order to minimize impacts to state-listed species

Division of Fisheries and Wildlife
Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-7890
An Agency of the Department of Fish & Game

and their habitats, revisions to the project shall include significant reduction of proposed development within the mapped Priority Habitat adjacent to Reedy Meadow. Stormwater data provided in the filing indicates a significant decrease in both peak runoff (Table 5-2) and peak volume (Table 5-3) at four of the six provided design points yielding a decrease in delivery of water from the site into the surrounding wetlands under all modeled storm scenarios. Particularly concerning are the lowered rates and volumes at the smaller, more common storm events. Revisions to the project should include measures to more closely match pre- and post-development delivery of water to the surrounding wetlands while complying with applicant other regulatory standards. Substantial auditory disturbance to these birds is proposed during critical breeding and nesting periods according to the construction schedule in section 1-31 due to the blasting and on-site rock-crushing activities. Revisions to the project should include avoidance of disturbance through timing restriction for blasting and rock-crushing, as the birds are absent from the wetland during the late fall and winter.

Based on the plans and information submitted in the EENF, the NHESP will likely require field surveys for state-listed marsh birds as part of our MESA review pursuant to 321 CMR 10.18. The EENF states that the applicant has conducted "extensive surveys" relative to state-listed species ("Discussion" of ENF form). The filing goes on to state in section three that an ornithologist visited the site several time during the spring. The NHESP has no record that the applicant consulted with us regarding surveys for the above-noted species nor have we received a post-survey report to review. The project proponent should note that endangered species surveys conducted as part of the MESA project review process must be carried out by qualified experts in accordance with protocols pre-approved by NHESP staff.

A filing directly with the NHESP is required pursuant to the MESA (321 CMR 10.18) for project in *Priority Habitat.* If the NHESP determines that the proposed project would "take" a rare species, then it may be possible to redesign the project to avoid a "take." If such revisions are not possible, the applicant should note that projects resulting in the "take" of state-protected wildlife may only be permitted if they meet the performance standards for a "Conservation and Management Permit" pursuant to 321 CMR 10.23. The proponent must demonstrate that the project has avoided, minimized and mitigated impacts to State-listed Species to receive a "Conservation & Management Permit" consistent with the following performance standards: (a) the applicant has adequately assessed alternatives to both temporary and permanent impacts to State-listed Species; (b) an insignificant portion of the local population would be impacted by the project, and; (c) the applicant agrees to carry out a conservation and management plan that provides a long-term Net Benefit to the conservation of the state-listed species impacted (321 CMR 10.23). Please do not hesitate to contact Misty-Anne R. Marold, Endangered Species Review Biologist, at (508) 389-6356 (misty-anne.marold@state.ma.us) with any questions or comments you may have. Thank you for the opportunity to comment on this project.

Sincerely,

Thomas W. French

Thomas W. French, Ph.D.
Assistant Director

CC: Felipe Schwarz, AICP, Vanasse Hangen Brustlin, Inc.
PHF-ND Colonial LLC
MA Department of Environmental Protection, Southeast Regional Office, Wetlands
Lynnfield Conservation Commission
Lynnfield Planning Board
Wakefield Conservation Commission
Wakefield Planning Board

AC

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION

EOT

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

BERNARD COHEN
SECRETARY

October 10, 2007

Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RECEIVED
OCT 11 2007
MEPA

RE: Lynnfield – Meadow Walk at Lynnfield - EENF
(EOEA #14096)

ATTN: MEPA Unit
Anne Canaday

Dear Secretary Bowles:

On behalf of the Executive Office of Transportation and Public Works, I am submitting comments regarding the proposed Meadow Walk at Lynnfield project, as prepared by the Office of Transportation Planning. If you have any questions regarding these comments, please call J. Lionel Lucien, P.E., Manager of the Public/Private Development Unit, at (617) 973-7341.

Sincerely,

David J. Mohler
Acting Deputy Secretary for Planning

DJM/jll

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION AND PUBLIC WORKS
OFFICE OF TRANSPORTATION PLANNING

MEMORANDUM

TO: David J. Mohler, Acting Deputy Secretary for Planning
Executive Office of Transportation and Public Works

FROM: J. Lionel Lucien, P.E., Manager
Public/Private Development Unit

DATE: October 8, 2007

RE: Lynnfield – Meadow Walk at Lynnfield - EENF
(EOEA #14096)

The Public/Private Development Unit has reviewed the Expanded Environmental Notification Form (EENF) for the proposed Meadow Walk at Lynnfield project. The project will be located on a 203-acre parcel of land, just west of Interstate 95 (Route 128) between the Walnut Street and the Salem Street interchanges. The parcel is bounded by Walnut Street to the east, I-95 southbound to the south, Audubon Road to the west, and Reedy Meadow to the north. Access to the site is proposed through the existing site drive that intersects Walnut Street and a secondary site drive which intersects Audubon Road. This project proposes the construction of approximately 1,024,200 square feet of mixed-use development on the site of the existing Sheraton Colonial golf club and hotel. The mixed-use project will retain the existing hotel and sports club and will add an additional 395,000 square foot retail center, 80,000 square feet of office, and 220 housing units, of which 40 will be set aside for elderly housing, and provide 3,438 parking spaces. In addition, the existing 18-hole golf course will be converted into a nine-hole course and donated to the Town of Lynnfield as a public course. Based on Land Use Codes 220 (Apartments), 252 (Senior Housing), 710 (Office), and 820 (Shopping Center), the project is estimated to generate a total of 19,079 vehicles per day on an average weekday. The project will require a MassHighway access permit for indirect access to I-95 via Walnut Street or Audubon Road.

The proponent has requested a waiver for the preparation of a Single EIR (SEIR). The EENF included a traffic study that generally conforms to the EOEEA/EOTPW Guidelines for Traffic Impact Assessment and has adequately analyzed the traffic and proposed mitigation measures that will address the project's impact on the state highway system. We, therefore, would not object to the waiver request. However, the proponent should address the following comments in the SEIR.

The Expanded ENF has outlined the mitigation measures that will be implemented by the project proponent to accommodate the traffic likely to be generated by this project. Improvements are proposed at the following locations: the Audubon Road/Colonial Golf Club Driveway intersection, the Audubon Road/I-95 southbound ramps intersection, the Walnut Street/Salem

Street/I-95 northbound ramps intersection, and the Walnut Street/I-95 southbound ramps/Colonial Golf Club Driveway intersection. In addition, three of the study area intersections will be updated as part of the MassHighway traffic signal improvement project which is scheduled for the 2009 TIP. These include the Salem Street/Pleasure Island Road intersection, the Salem Street/I-95 northbound ramps intersection, and the Salem Street/Montrose Avenue intersection. The project proponent should continue discussions with MassHighway to more clearly define in the SEIR the details and the schedule implementation of the MassHighway improvements in relation to their project. The SEIR should include a letter of commitment that details the mitigation the project proponent intends to implement on behalf of this project. In addition, the project proponent should work with MassHighway to coordinate the two projects to minimize construction impacts.

The proposed site plan offers an opportunity to connect the existing office and hotel land uses with the proposed development. The Expanded ENF outlines a number of measures that the project site will provide to facilitate bicycle and pedestrian trips from the different land uses within the development. The project proponent should initiate discussions with the Council of Aging in Lynnfield to provide service for the senior residential units.

The EENF included the Salem Street/Route 1 intersection in the study area; however, there was no discussion of either the operations or proposed roadway improvements to mitigate the impacts of the project at this location. The SEIR should provide a discussion of operations at this intersection, as well as the necessary mitigation measures to offset the impacts of the project. In addition, the SEIR should provide a discussion of the existing, no-build, and build merge and diverge conditions along Route 128 at the Walnut Street interchange and the Salem Street/Audubon Road interchange. The SEIR should also include additional detail regarding the roadway configuration at the I-95 Bridge over Walnut Street.

The SEIR should provide an update of the local permitting processes for the proposed project, particularly with respect to any state highway issues being discussed. We strongly encourage proponents to consult with MassHighway before any state highway issues are discussed in local meetings or hearings.

We recommend that the project proponent meet with the Public/Private Development Unit and the MassHighway District 4 Office prior to the submission of the SEIR. If you have any questions regarding these comments, please contact Erin Kinahan of the Public/Private Development Unit at (617) 973-8059.

cc: Luisa Paiewonsky, Commissioner
David Anderson, P.E., Acting Chief Engineer
Patricia Leavenworth, P.E., District 4 Highway Director
Neil Boudreau, State Traffic Engineer
Public/Private Development Unit files
Planning Board, Town of Lynnfield
Planning Board, Town of Wakefield
Metropolitan Area Planning Council
Boston Region Metropolitan Planning Organization

AC

Town of LYNNFIELD

DARLENE E. DRUTMAN, Chairman
ARTHUR J. BOURQUE III, Selectman
ROBERT P. MacKENDRICK, Selectman

WILLIAM J. GUSTUS
Town Administrator

BOARD OF SELECTMEN

October 10, 2007

RECEIVED
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MEPA

Secretary Ian Bowles
Attn: Anne Canaday
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2524

RE: Meadow Walk at Lynnfield (EOEA #14096)
Dear: Secretary Bowles

I am writing to convey the unanimous support of the Lynnfield Board of Selectmen for the above referenced project and for the application of National Development for a Single EIR. This project has been studied by the Town of Lynnfield for well over a year. After an extensive review by the Board of Selectmen, the Planning Board, the Conservation Commission and all Town Departments, it received the unanimous support of all Town Agencies. Virtually dozens of public meetings and forums were devoted to the review of this project.

Town Meeting was attended by over two thousand residents, a record for the Town of Lynnfield, and the establishment of a 40R Smart Growth Zoning District to accommodate this development was approved by a four to one vote. Meadow Walk at Lynnfield will generate hundreds of new jobs, forty –five units of affordable housing, will expand our tax base by an incredible $1.75 million, will preserve in excess of one hundred acres of open space including the environmentally sensitive Reedy Meadow, and will provide new shopping, restaurant and recreational uses for the town and the region.

We are confident that the plan put forth by National will respect the natural beauty of the area and that the development will more than adequately protect the environment. During our review process, National was particularly sensitive to the environmental concerns raised by a development of this size.

Thank you for your consideration in this matter.

Very truly yours,

William J. Gustus
Town Administrator

TOWN HALL 781-334-3180 781-334-7660 FAX: 781-334-0014
55 SUMMER ST., LYNNFIELD, MA 01940-1823 e-mail: william-gustus@town.lynnfield.ma.us

L.I.F.E. Incorporated
101 Essex Village
Lynnfield, MA 01940-1269
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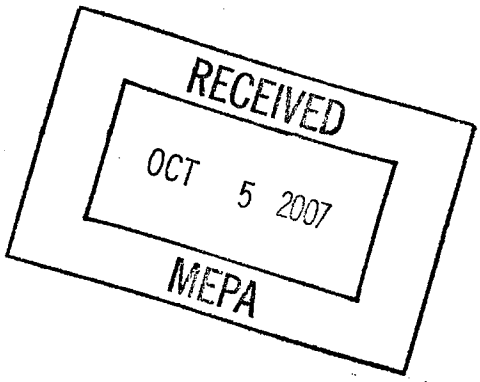
Telephone & FAX +1.781.334.6066

AC
14096

Center Village | Essex Village | Colonial Village

October 3, 2007

Mr. Ian Bowles
Secretary of Energy and Environmental Affairs
Executive office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2534



RE: Meadow Walk at Lynnfield

Dear Mr. Secretary,

Lynnfield Initiatives for Elders, Inc. (LIFE) is a non-profit corporation established in 1982 for the purpose of creating reasonably priced housing for the elderly. LIFE acquired land in 1983 and built 60-units of elderly housing which is known as Center Village. In 1987, LIFE acquired land on Essex Street in Lynnfield and constructed 66-units of elderly housing which is known as Essex Village.

During the process of National Developments planning of Meadow Walk at Lynnfield an agreement was reached amongst National Development, the Town of Lynnfield, and LIFE. It was agreed that LIFE would purchase 6-acres of land at the Colonial Golf Course site. LIFE would build a third village with 40-units of elderly housing.

We, at LIFE, are very much in favor of this multi-use project where retail, office, apartment housing, and elderly housing will be created to exist side by side, in an atmosphere of vibrant living.

In view of the significant review of all aspects of this project performed in preparation for the vote at Lynnfield Town Meeting, we are also very much in favor of the filing of a single EIR.

Very truly yours,

H. Joseph Maney
President
L.I.F.E., Inc. Board of Directors

Saugus River Watershed Council

10 October 2007

Secretary Ian Bowles
EOEEA, Attn: MEPA Office
Analyst Ann Canaday, EOEA #14096
100 Cambridge Street, Suite 900
Boston, MA 02114

Re: Expanded Environmental Notification Form, Meadow Walk at Lynnfield

Dear Secretary Bowles:

The Saugus River Watershed Council is a non-profit organization founded in 1991 to protect and restore the natural resources of the Saugus River watershed. Our organization includes over 675 members and hundreds of volunteers. Our board of directors includes two environmental engineers, an attorney, a geologist, a hydrologist, and several other community leaders. We have reviewed the Expanded Environmental Notification Form for the Meadow Walk at Lynnfield project and we respectfully submit the following comments for your consideration.

Background

The Saugus River Watershed Council has been working actively to protect and restore important natural resources of the Saugus River and Reedy Meadow, adjacent to the project site. Reedy Meadow has been designated as a National Natural Landmark because of the unique value of its 540-acre freshwater marsh to wildlife. The Massachusetts Audubon Society has also recently designated Reedy Meadow as one of only 79 Important Bird Areas (IBA) in the state of Massachusetts because it provides valuable habitat for a wide variety of birds. The main stem of the Saugus River flows through Reedy Meadow adjacent to the Colonial property before reaching the diversion dam operated by the Lynn Water and Sewer Commission. The upper portions of the Saugus River watershed (above the dam) provide drinking water for the City of Lynn. Water from upstream is diverted from the Saugus River via the Lynn Water and Sewer Commission diversion canal into Lynn's drinking water reservoirs (see Attachment A). The site is also important because it supports fisheries including a healthy American eel run which was documented during the spring of 2007 by the Massachusetts Division of Marine Fisheries and the Saugus River Watershed Council.

In support of our efforts to maintain adequate water flows, improve water quality and restore fisheries to the Saugus River watershed, the Council has coordinated and been involved with several projects that provide background information about the status of natural resources adjacent to the proposed development site. These include a Saugus River flow study, a fish passage and hydrology study, water quality analysis, and an American eel monitoring and restoration program.

As described in the EENF, the project proponent spent significant effort in negotiations with the Town of Lynnfield regarding economic and community development aspects of the project prior to submitting an EENF. Several positive changes were made in response to community concerns regarding project size, elderly and 40B housing, open space, visual impact to neighborhoods and other issues. Following extensive outreach, the town voted to adopt 40R zoning for the site. During its outreach (and in the EENF), the developer indicated that an open space restriction would be placed upon 103 acres of the site which is to be donated to the Town of Lynnfield for use as a reconfigured 9-hole golf course. The developer and the Town of Lynnfield also adopted a development agreement and associated design standards to provide a framework and guiding principles for site design.

Given the size and scope of the project -- as well its location adjacent to significant natural resources, a source of drinking water supply, and valuable wildlife habitat -- every effort must be made to thoroughly document existing conditions, monitor the potential impact of the project on natural resources, and protect and restore natural resources to the maximum extent feasible.

Project Scope

The proposed Meadow Walk at Lynnfield project is a mixed use development that includes 395,000 square feet of retail space, 80,000 square feet of office space, 220 residential units (including 135 market rate and 45 affordable multi-family rental units and 40 elderly housing units), and a total of 3,438 parking spaces. The project will include approximately 55 acres of impervious area, an increase of 37 acres over existing conditions. Of the 203-acre site, 103 acres will be designated as open space for continued use as a golf course by the Town of Lynnfield (53 acres of the 103 will include a conservation restriction). The project is being developed under Chapter 40R Smart Growth Zoning and Housing Production.

Request for a Single EIR

We respectfully ask the Secretary to require that the project proponent file both a draft and final EIR for the Meadow Walk at Lynnfield project. At 88 acres of proposed construction, this project is the largest development to take place in the Saugus River watershed since our organization was founded in 1991. In addition to its extensive size and scope, the project has the potential for significant environmental impacts to natural resources as it is located adjacent to the Saugus River, the Reedy Meadow National Natural Landmark, and the canal which transports water from the Saugus River into the City of Lynn's reservoir system.

After reviewing the EENF, we believe that it **does not meet the requirements for a single EIR** according to 301 CMR 11.05 (7), because it does not satisfy requirements (b) or (c) of the regulations.

> **Requirement (b):** ***"provides a detailed baseline in relation to which potential environmental impacts and mitigation measures can be assessed"***
>
> The EENF does not meet requirement (b) because it does not provide an adequate baseline in relation to which potential environmental impacts and mitigation measures

can be assessed. The Expanded Environmental Notification Form for Meadow Walk at Lynnfield provides insufficient information about natural resources on or adjacent to the project site.

The EENF does not provide information about the project's potential impact on the Saugus River as a source of drinking water to the City of Lynn. The EENF does not acknowledge that Reedy Meadow has been designated as a National Natural Landmark. The EENF provides no baseline information about existing water quality conditions in Reedy Meadow or the Saugus River, nor does it reference any of the existing hydrology studies, fish monitoring programs or water quality analysis previously conducted by other organizations such as the Massachusetts Department of Environmental Protection, the Saugus River Watershed Council, and the Massachusetts Division of Marine Fisheries.

The project site includes a Massachusetts Hazardous Waste site associated with Release Tracking # 3-2655. Additional information is needed to assess the status of this site and the relationship of potential contamination with planned construction activities. This release is associated with an "unknown chemical" and methyl-benzene in groundwater. Analysis is also needed to determine the status of existing soil quality related to this hazardous waste site as well as historic use of pesticides and herbicides. Although the EENF indicates that five shallow groundwater monitoring wells have been installed, they don't indicate any sampling or results for the typical constituents such as metals, bacteria, PAHs, chloride, pesticides, herbicides, VOCs, and phosphorus. Additional groundwater monitoring should focus on these parameters as well as potential impacts associated with the RTN mentioned above.

Requirement (c): ***"demonstrates that the planning and design of the Project use all feasible means to avoid potential environmental impacts"***

The EENF does not provide adequate information to satisfy requirement (c). As there is very little discussion about the natural resources adjacent to the site, it is impossible to evaluate the impact of planning and design features on those resources.

The EENF also does not include adequate planning or design information regarding the selection of wastewater treatment options or reconstruction of the roadway crossing over the Saugus River. Both of these elements of the project are complex and could have a significant negative impact on the resources of the watershed.

In addition to documenting baseline conditions and the impact of proposed development, we urge the project proponent to incorporate the following elements (as further outlined in this letter) into their project as part of their effort to use all feasible means to avoid potential environmental impacts -

- Expand and provide firm commitments for low impact development techniques and best management practices associated with traffic, construction, parking, stormwater management and landscaping. Priority should be placed upon those

LID techniques which reduce the amount of impervious surface area, and those that slow and treat stormwater flow using landscape features.

- Enhance and expand the vegetated buffer zone along the perimeter of Reedy Meadow and the Saugus River adjacent to portions of the site to be developed.
- Consider creating a new area with native plantings, wildlife habitat, interpretive information, and public access with a conservation restriction on the parcel of land (currently not proposed for construction) adjacent to the diversion canal and the Saugus River.

Issues to be Addressed in Draft Environmental Impact Report

The Saugus River Watershed Council respectfully asks that the following issues be addressed in the Draft Environmental Impact Report for the Meadow Walk at Lynnfield project.

Lynn Drinking Water Supply

The DEIR should provide detailed plans to ensure protection of the water resources flowing through the Saugus River and Reedy Meadow and transported by the Lynn Water and Sewer Commission diversion canal into the City of Lynn's reservoir system.

Potential Project Impact on Fisheries

The project proposes widening the road (from 19 to 26 feet) which provides access through the site from Audubon Road in Wakefield to Walnut Street in Lynnfield. Because this roadway crosses the Saugus River, reconstruction work and associated filling could have a potential negative impact on an American eel fish run (see Attachment B). The EENF highlights off-site transportation improvement plans in section 6 and provides associated engineering plans in Attachment J. Unfortunately, similar detail regarding reconstruction of the roadway crossing the Saugus River is not provided. The DEIR should include documentation regarding consultation with the Massachusetts Division of Marine Fisheries regarding this roadway reconstruction. Construction periods will need to be timed so as to avoid periods when the American eel are running. Engineering plans (including culvert design) and associated mitigation steps are needed to evaluate this proposed road widening plan and ensure that there is no negative impact to fisheries, water flow, or water quality.

The combination of already damaged buffer zone (i.e. previous removal of shade trees) and significantly increased impervious surface through new buildings and 3,438 new parking spaces is likely to increase water temperatures in the Saugus River and Reedy Meadow. In order to protect fisheries it is important to both document and mitigate the impacts of Meadow Walk at Lynnfield on water temperature in the Saugus River and Ready Meadow.

During the spring of 2007, the Saugus River Watershed Council worked in partnership with the Massachusetts Division of Marine Fisheries, and the Lynn Water and Sewer Commission to monitor and promote the restoration of American eel populations within the Saugus River watershed. With funding from the Gulf of Maine Council on the Marine Environment - NOAA

Restoration Center, Division of Marine Fisheries staff designed and installed a ramp to enable American eels to pass over the Lynn Water and Sewer Commission dam in the Saugus River.

The eel ramp is the only one of its kind in New England and was designed especially for this location. Shortly after the ramp was installed this spring, eels began making their way over the dam into upstream freshwater habitat of the Saugus River and Reedy Meadow. By the end of the season (early July) over 9,000 eels had utilized the ramp. This program highlights the value of fish habitat in the Saugus River and Reedy Meadow and the need to ensure that reconstruction of the roadway, stormwater drainage, and other aspects of the project do not damage this important resource. The Massachusetts Division of Marine Fisheries and the Saugus River Watershed Council are planning to continue the eel restoration, ramp and monitoring program for the Saugus River into 2008 and beyond (see Attachment B).

Protecting Buffer Zones

Though not historically the fault of National Development, the vegetated buffer zone adjacent to both the Saugus River and Reedy Meadow at this site has been consistently destroyed and encroached upon for years. Unfortunately, maintenance practices at both the golf course and hotel often resulted in cutting down large trees and clearing brush which provided important shading and protection for fish and habitat for birds in the Saugus River and Reedy Meadow. Violations took place as recently as this year, with the Lynnfield Conservation Commission requiring replanting in an attempt to replace important shade trees that had been removed from the riverbank.

The combination of past negative practices and potential impact from the proposed development could cause significant damage to the natural resources. Naturally vegetated areas which provide buffer zones for wildlife, natural filtration of polluted runoff, and important shading to help keep water temperatures in the river from rising should be restored as part of the proposed project.

Section 9 of the EENF indicates that the project proponent will enhance areas of the existing golf course that will not be developed in order to provide a natural buffer next to the wetland resources on the property. However, no detail is provided regarding this proposal. The DEIR should include detailed maps, planting plans and site diagrams to indicate the location, size and type of buffer zones to be enhanced. The Council recommends that buffer restoration/enhancement take place on all portions of the property to be developed adjacent to the Saugus River and Reedy Meadow. The addition of large (mature) shade trees should be included at a minimum along both sides of the main stem of the Saugus River downstream of the Lynn Water and Sewer Commission dam. The buffer zone adjacent to Reedy Meadow and the diversion canal should also be enhanced to protect natural resources as well as the quality of the City of Lynn's drinking water supply.

Restoration and enhancement of buffer zones are also important to protecting bird habitat found in Reedy Meadow. The Massachusetts Audubon Society has identified Reedy Meadow as one of only 79 Important Bird Areas (IBA) in the Massachusetts. IBAs are sites which regularly hold significant numbers of endangered, threatened, vulnerable, or declining species. The scale of new development proposed adjacent to Reedy Meadow could have a negative impact on this

important bird habitat. Restoring and expanding upon buffer zones with plantings that provide shelter, food and cover for birds would help to mitigate this potential negative impact.

Stormwater Management and Drainage

SRWC has reviewed the Stormwater section and Drainage Report included to the EENF. The Council requests that the project proponent include larger scale maps and diagrams related to the Drainage Study in the DEIR regarding the existing and proposed drainage boundaries and discharge points. Figure 5 in the drainage report is particularly difficult to evaluate. A larger scale map utilizing color coding would enable the reviewers to identify the drainage area boundaries as they relate to the proposed development plan, detention ponds, and discharge points.

Additional information is needed to describe what the likely inputs to stormwater quality will be post-development. Information regarding stormwater management techniques should relate directly to those inputs and include a description of how these potential pollutants are being removed or treated. The University of New Hampshire's stormwater center is one possible source which could be referenced regarding utilization of certain BMPs to treat specific types of pollutants. The impact of removing inflow and infiltration from the sewer system should be accounted for in the stormwater management plans.

The Drainage Study focuses on the southern 88 acres of the site which is the area proposed for redevelopment. Of those 88 acres, approximately 46.3 acres would discharge to the lower end of Reedy Meadow at discharge point #1. The Saugus River is located within that area of Reedy Meadow and continues immediately below the Lynn Water and Sewer Commission dam. The Council is concerned about the potential negative impact to water quality at this site. Water quality sampling conducted by the Council indicates that while the Saugus River upstream near the outlet at Lake Quannapowitt (significantly upstream of the project site) is often contaminated with bacterial pollution, Reedy Meadow effectively provides natural filtration so that water quality in the vicinity of the Lynn Water and Sewer Commission dam exhibits very little bacterial pollution. Point discharge of significant new amounts of stormwater could degrade existing water quality in this location.

Discharge point #3 drains to the diversion canal which transports water from the Saugus River to the City of Lynn's reservoir system. Stormwater discharges for this outstanding resource water should be removed or reduced and treated at the highest possible level.

To mitigate potential impacts from bacteria and thermal pollution, the Council suggests that, to the maximum extent practicable, the developer include BMPs ahead of discharge points #1 and #3 that will provide for the capture, treatment, and percolation to groundwater (after TSS removal) of all runoff from impervious areas generated by up to the 5-year 24-hour storm. We note that the current plan does provide for use of detention ponds for some of the drainage areas on the site.

The DEIR should include additional detail regarding operational Best Management Practices to ensure protection of the Saugus River, Reedy Meadow and the diversion canal. The proposed

annual street sweeping is unlikely to be sufficient, particularly with the use of sand to maintain roadway safety during the winter. SRWC recommends a minimum of quarterly street sweeping. The DEIR should include commitments regarding practices for maintaining road safety during the winter. Rock salt should not be used on the site as it could have a potential negative impact on the City of Lynn's drinking water supply. Use of pesticides on the site should be limited in general and avoided in or around sensitive resources.

Additional information is needed regarding baseline characteristics of groundwater. Existing wells should be used to provide water quality analysis of groundwater. A water table map is needed to show the fate and transport direction of stormwater as it impacts groundwater and flows to Reedy Meadow and the Saugus River. Additional information should be provided related to groundwater quality associated with RTN 3-26555.

Wastewater Treatment

An August 2007 letter from the Wakefield Board of Selectmen approved in concept the proposal to allow this Lynnfield project to connect to Wakefield's Municipal Sewer System. The DEIR should provide detail regarding all potential wastewater management options considered for this project.

The Saugus River Watershed Council notes concern regarding the potential transfer of water out of the region by transporting wastewater ultimately to the Massachusetts Water Resources Authority system via an upgraded sewer main through Wakefield. Water levels in the Saugus River have been sporadic over the past several years, experiencing many of the same problems with lack of flow during dry periods as other rivers throughout the state. Additional efforts are needed to promote water conservation on site.

Other issues that need to be reviewed as part of the wastewater management plan are: 1) evaluate the feasibility of on-site treatment options that would keep water local, 2) provide detailed plans regarding the size, location, construction and maintenance associated with any proposed sewer main, 3) evaluate the potential for off-site pollution problems in the Saugus River or Mill River that could result from capacity problems that may be caused by adding wastewater to the Town of Wakefield's sewer lines (i.e. any potential increase in direct discharges from the sewer system downstream during major storm events), and 4) evaluate the impact of potential sewer main problems on a source of drinking water.

Low Impact Development Techniques

While some Low Impact Development techniques are discussed generally in the EENF and highlighted as allowable options within the Design Standards and Protocols, the DEIR should include firm commitments along with detailed plans for incorporating these practices into the buildings, parking and associated landscaping of the project.

Incorporating sustainable construction practices into this project is particularly important because of the size and scope of new buildings and impervious surfaces, as well as the project's location adjacent to significant natural resources. We urge the developer to commit to Leadership in

Energy and Environmental Design (LEED) certified building practices for all of the residential, retail and office buildings being proposed at this site. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

The DEIR should also identify measures to quantify and reduce emissions for greenhouse gases associated with the project as required by the MEPA Greenhouse Gas Emissions Policy and Protocol. As required by the policy, the DEIR should also include measures to avoid, reduce or mitigate such emissions. Utilizing the LEED certification process for buildings and reducing emissions associated with vehicle traffic are two possible measures for mitigating greenhouse gas emissions. A project of this size should also consider the feasibility of incorporating innovative energy saving concepts such as a zip car depot, preferential parking for hybrid vehicles, and renewable energy such as solar photovoltaic panels for some of the buildings.

Promoting use of public transportation is one of the key elements associated with Smart Growth development. As indicated in the EENF, the closest bus routes to the project site are 1.5 miles west and 2.5 miles east of the project site - - neither close enough to provide viable public transportation to the project site. In order to minimize new sources of greenhouse gas pollution associated with the expanded number of vehicles traveling to and from the site, the project proponent should work with the MBTA and local communities to explore viable new public transit options for connecting to existing public transit.

The potential for reducing the amount of impervious surface used for parking should be evaluated as part of the alternatives analysis in the DEIR. Reducing surface parking would help alleviate stormwater pollution as well as the potential for increasing water temperature in the Saugus River and Reedy Meadow. Alternatives for incorporating pervious pavement in some segments of the development should also be considered.

Public Access and Additional Conservation Restriction

Strategies to promote environmental stewardship and education for the public regarding the natural resources of the Reedy Meadow National Natural Landmark and the Saugus River should be pursued as part of the mitigation associated with this project. Incorporating public amenities such as walkways, benches, and interpretive information (focused on the natural resources) would enhance the overall environmental and public access aspects of this project. At a minimum full-perimeter public access should be provided to both Reedy Meadow and the Saugus River.

The Council recommends that the project proponent also consider incorporating a new conservation area with public access, amenities and interpretive information adjacent to the LWSC diversion canal and the Saugus River. This portion of the site is currently used as part of the existing golf course, and the project proponent has not indicated any current construction plan for this portion of the site. Including a conservation restriction would help to protect natural resources and eliminate the potential for future development of this parcel and any additional sources of pollution associated with that development.

Review of Existing Studies and Programs

As part of the process for documenting baseline conditions, the project proponent should review previously conducted scientific studies and programs related to the natural resources on the site. This review should include but not be limited to the following:

- An Evaluation of Saugus River Fish Passage and Hydrology, January 2006. Prepared by Gomez and Sullivan Engineers for the Saugus River Watershed Council, the Massachusetts Division of Marine Fisheries, and the Gulf of Maine Council on the Marine Environment/NOAA Habitat Restoration Partnership.

- Saugus River Water Budget and Instream Flow Study, June 2002. Prepared by Gomez and Sullivan Engineers for the MA Dept. of Environmental Management.

- Saugus River American Eel Monitoring and Restoration Program, 2007. Information is available by contacting the Saugus River Watershed Council (Director, J. LeBlanc) or the Massachusetts Division of Marine Fisheries (Marine Biologist, B. Chase).

- Important Bird Area Program. Information regarding Reedy Meadow's designation as an Important Bird Area is available from the Massachusetts Audubon Society, North Shore.

- Reedy Meadow National Natural Landmark. Information regarding Reedy Meadow's designation as one of approximately 600 National Natural Landmarks across the country is available from the National Park Service.

In closing, we reiterate the importance of this site to local wildlife, water supply, and natural resources in the Saugus River watershed. We look forward to working with you and the developer throughout the MEPA review and environmental permitting process to ensure that this major project does not have a negative impact on the environment.

Thank you in advance for your consideration. Please feel free to contact me at 781-233-5046 if you have any questions about the Saugus River Watershed Council or our comments regarding this project.

Sincerely,

Joan LeBlanc
Executive Director

Attachments

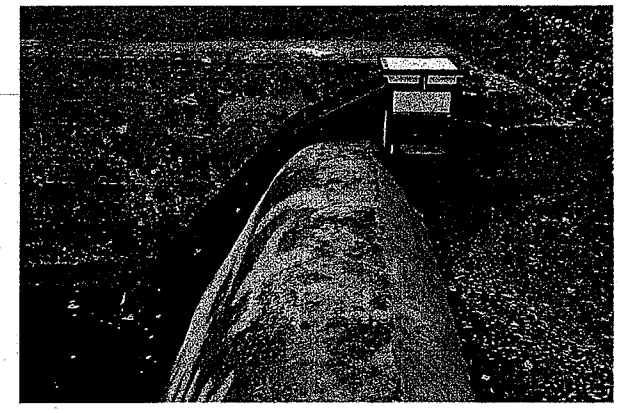
A. Aerial view of Saugus River / Reedy Meadow / LWSC canal
B. Eel ramp and upstream roadway crossing Saugus River / Reedy Meadow

Saugus River Watershed Council

Attachment A

Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs. Imagery was captured in April 2001.

Saugus River Watershed Council
Attachment B



After making their way up the eel ramp (left), juvenile American eels were caught and counted in the box trap (right) before being released upstream. May 2007.

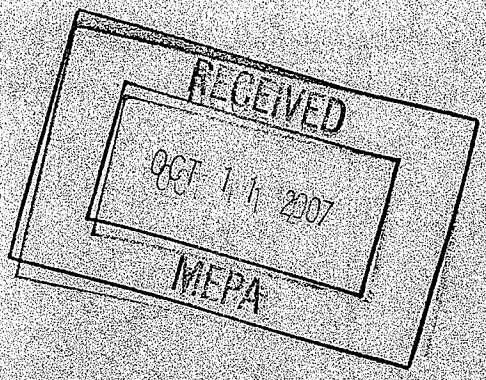
This spring, the Saugus River Watershed Council worked in partnership with the Massachusetts Division of Marine Fisheries, the Lynn Water and Sewer Commission, and the National Park Service to promote restoration of American eels in the Saugus River watershed. With funding from the Gulf of Maine Council on the Marine Environment - NOAA Restoration Center, the Division of Marine Fisheries designed a ramp to enable American eels to pass over the Lynn Water and Sewer Commission dam in the Saugus River.

The eel ramp is the only one in New England and was designed especially for this location. Shortly after the ramp was installed, American eels began making their way into the upstream areas of the Saugus River and Reedy Meadow. During one sampling day, over 2,600 eels were counted before being released upstream.

By the end of the season, over 9,000 eels had traveled up the Saugus River and over the ramp in search of freshwater areas to mature. Once they reach full maturity in a few years, they will head back downstream, out to the ocean and eventually to the Sargasso Sea to spawn. The adults then die and the juveniles make their way back to New England waters. This year's eel passage program highlights the value of fish habitat in the Saugus River and Reedy Meadow, and has given the American eel population a boost.

View looking upstream from the LWSC dam and eel ramp. This roadway, which crosses the Saugus River / Reedy Meadow via two culverts, travels through the Meadow Walk project site connecting Audubon Road in Wakefield with Walnut Street in Lynnfield.

AC



October 10, 2007

Secretary Ian Bowles
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: Expanded Environmental Notification Form (EENF)
Meadow Walk at Lynnfield
MEPA # ~~09800~~ 14096

Dear Mr. Bowles:

We have reviewed the EENF for Meadow Walk at Lynnfield, a proposed mixed-use retail, office and residential redevelopment of a portion of the Sheraton Colonial Golf course in Lynnfield and Wakefield. We are pleased that walking is being encouraged as a major organizing feature of the development - a worthy initiative. We are commenting because of the immense potential for incorporating extensive pedestrian access in mixed-use suburban development throughout Massachusetts.

WalkBoston is the Commonwealth's leading advocate for pedestrians and safe walking. We work throughout the state – encouraging walking, advocating for pedestrian improvements and working for design improvements. We have extensive experience helping residents and local government with pedestrian issues, safe routes to school, and safer street crossings.

The proposed Meadow Walk at Lynnfield comprises 395,000 SF of retail space, 80,000 SF of office space and 200 housing units of which 40 are allocated to the Lynnfield Initiative for Elders (LIFE). It includes 3,438 parking spaces and will increase the number of vehicle trips generated by the site from 644 to 19,079 per day. The retail/office components of the development are designed to be a traditional Main Street where frontage is lined with retail outlets, and on-street parking and pedestrian amenities are key design elements.

The scale of the development is sprawling. Most of the buildings appear to be 1 story in the retail areas, with 2-story exceptions (shown in renderings of the central open space.) Buildings taller than 2 stories are included in the residential areas.

Summary of comments:

- The development appears to be primarily an outdoor mall, without roofed pedestrian walkways and with a street where an enclosed walkway inside a standard mall might ordinarily appear. Notwithstanding some token nods to pedestrians, the overall site is characterized by vast parking lots, relatively high-speed roadways around the lots, visibility from a major highway, and traffic that is dispersed around the site.
- Of the roughly 2 miles of roadway to be constructed, one half mile is truly pedestrian-friendly, while one mile serves solely vehicular traffic and another half mile serves the back side of the retail/office structures with little physical separation of pedestrian and vehicular movements.
- If pedestrian friendliness is to be a major selling point of the development, a great deal of adjustment should be made to the current design to incorporate elements more specifically encouraging to pedestrians.

walkBoston

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156 Milk Street | Boston MA 02109 T: 617.451.1570 F: 617.451.6475 info@walkboston.org | www.walkboston.org

Overall site plan

- A high density of uses in the center of the development, tapering toward the perimeter, does not appear as a guiding feature of the plan. High density encourages walkability.
- The proposed development rigorously separates land uses. The retail/office uses are separated from the residential uses and open spaces. Uses are not mixed within single structures (except perhaps for offices). Residences are not planned above stores or offices, though that would encourage walking.
- The street network could benefit from full integration of the interior Main Street with parking service streets and from street connections to the residential area.
- The existing Boston Sports Club building and Sheraton Hotel, which are to remain on the site, have not been integrated in any way with the proposed development.
- The comparably-scaled Mashpee Commons on Cape Cod offers a useful contrast in pedestrian friendliness. A similar development of 250,000 SF of retail space with 90 stores, Mashpee Commons has residential uses above many retail outlets, creating walkability as a major feature. Its circulation plan emphasizes the creation of traditional city blocks, multi-story structures that hold both retail and residential uses, 2 main streets with connections to minor streets that lead to all parking lots, some very small-scale stores, and mid-block meeting places and walkways. Westwood Station, being planned at Rte 128/I 95, has 1000 residential units above or adjacent to retail.

Relationship to Traditional Neighborhood Development Planning

The development adopts many of the current concepts about traditional neighborhood developments without full embrace of them. In particular, it has these distinctions:

- A roadway solely for vehicles extends around the perimeter of the site for approximately one mile, and the interior pedestrian-friendly street is roughly a half-mile in length. The interior street is paralleled by a street on the other side of the retail/office structures that is also about a half mile long but with few pedestrian friendly features.
- Transit service does not connect directly into the site and is not within walking distance.
- Proposed pedestrian access ways are tied to streets. All pedestrians must enter the site at locations where vehicles also enter. Pedestrian circulation is entirely along the sidewalks next to the streets. No off-street pedestrian walkways for circulation or for access to the site or nearby open space areas are provided.
- Additional pedestrian access to the site could be added on the Walnut Street frontage of the site owned by the project proponent. Without this access, pedestrians arriving via Walnut Street must enter near the Rte 128 ramps, a location with heavy traffic volumes.
- On-street parking is permitted only on the Main Street, (making the sidewalks safer with the protection of a row of cars separating pedestrians from the roadway) and not on either the perimeter street or access ways into parking lots.
- The location of the site next to a protected environmentally sensitive site suggests the possibility of pedestrian walkways or jogging paths for recreation at the site perimeter. These paths might link to the Sheraton Hotel via the bridge over the Saugus River.

The retail/office components

- The roadway network for the retail and office elements consists of a perimeter road, with access into parking lots from 14 separate intersections. Five short streets connect the parking lots and the Main Street.
- The project's retail elements are organized around the spine of a traditional Main Street. The Main Street seems to serve a minimal circulation purpose, as it is a closed

loop within the overall project, connected primarily at an entrance location to the Rte 128/I-95 access points for the project.

- The interior street is gently curved – a nice touch.
- The proportion of street frontage with active commercial uses that encourage walking may be limited because all of the stores will have entries facing both the street and the parking lots. Retail operations are unlikely to be able to support window displays or store-related activities on two street frontages of each site.
- All buildings appear to be designed for large-scale uses – perhaps big box stores that swallow up frontage unless broken up by smaller stores.
- Small structures do not appear to be included, but encouraging participation of small entrepreneurs can encourage outdoor browsing and pedestrian activity.
- Parking seems to be excessive. The 3,438 parking spaces for the development contrast with Mashpee Commons with less that half that number.
- Open space in the retail/office area is limited to the small central square while open space outside the perimeter road is relatively lavish, because of abutting wetland.
- The interior shopping street should have a dense tree canopy to encourage walking.
- Design standards for sidewalk and path construction were not provided. In some instances, greater widths will provide more public space and greater levels of activity.

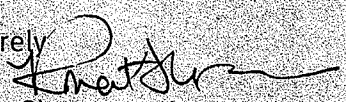
The residential components

Residential units include luxury housing (160 units) and the LIFE component (40 units) wholly separated from retail/office uses by the perimeter street. This results in:

- The retail and office mall comes close to the residential units at the only part of the site without vast parking capacity on the mall side. Even here, pedestrians must cross the parking lots in front of the residential buildings before crossing the street into the mall.
- The residential access road (a part of the perimeter road around the site) is about 1500 ft long between parking access points and has only two access points into the residential parking lots. This layout suggests it may become a relatively high-speed roadway with hazards for walkers. Two pedestrian crosswalks are provided to cross this street at the luxury apartments. No crosswalks are indicated for the LIFE buildings.
- Residential buildings could be grouped to reduce the impact on this environmentally-sensitive location. Grouping would allow residential structures to be at a greater distance from the wetlands, while retaining the pleasant views.
- There should be direct pedestrian access between the residential and retail/office uses. (Sidewalks are not always shown on the plans.) The possibility of a more direct connection might result in locating the residences inside the perimeter roadway where they can be more immediately adjacent to the retail/office uses.

Thank you for the opportunity to comment on this document, which offers great promise for improvements for pedestrians in a suburban setting. Please feel free to contact us for clarification or additional comments.

Sincerely



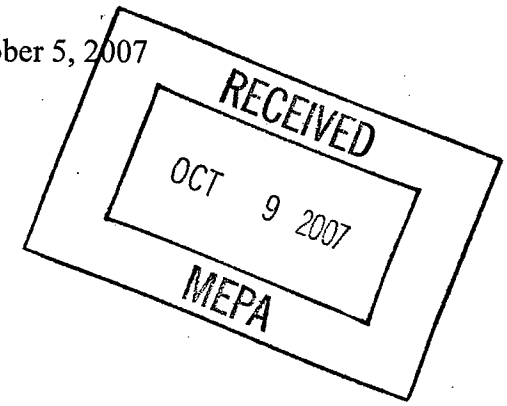
Robert Sloane
Senior Planner

AC

MASSACHUSETTS WATER RESOURCES AUTHORITY
Charlestown Navy Yard
100 First Avenue
Boston, Massachusetts 02129

Telephone: (617) 242-6000
Facsimile: (617) 788-4899

October 5, 2007



Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge St., Suite 900
Boston, MA 02114
Attn.: Anne Canaday, MEPA

Subject: Meadow Walk at Lynnfield
Expanded Environmental Notification Form - EOEEA # 14096

Dear Secretary Bowles:

The Massachusetts Water Resources Authority (MWRA) appreciates the opportunity to comment on the Environmental Notification Form (ENF) for the Meadow Walk at Lynnfield project proposed by PHF- ND Colonial LLC. The proposed project consists of a mixed-use retail, office and residential development on a portion of the existing Colonial Golf Course located off of Walnut Street in Lynnfield and Audubon Road in Wakefield. The ENF indicates that water will be supplied to the site via Wakefield and Lynnfield, both of which are members of the MWRA water service area. The ENF also indicates that 82,350 gallon per day (gpd) of wastewater would be generated by the proposed new development. It is the wastewater aspect of the project that is the focus of our comments below.

Discharge to MWRA via the Wakefield collection system is one of two wastewater management options mentioned in the ENF. In late September, MWRA met with the project proponent and Wakefield representatives to discuss significant concerns related to the potential addition of wastewater to the MWRA system from the Lynnfield portion (most of the site) of the proposed development. Downstream of the proposed Meadow Walk site's connection with Wakefield, the MWRA sewage transport system is already severely constrained in wet weather. While there is more than adequate capacity for existing dry weather flow, sewers experience inflow during extreme wet weather events well in excess of capacity. Downstream MWRA communities, such as Melrose, have been directly impacted as a result of sewers that surcharge and then overflow due to excess amounts of infiltration and inflow.

Lynnfield is not a member of the MWRA sewer service area. An existing agreement between the Wakefield, Lynnfield, and MDC includes some provision for sewer service to the Colonial site, but that agreement does not provide for the magnitude of flows and the nature of development now contemplated. As a result, MWRA has informed the applicant of the applicability of MWRA Operating Policy #11, *Admission of New Community to MWRA Sewer System and Other Requests For Sewer Service to Locations Outside MWRA Sewer Service Area.* This policy requires MWRA to find that certain conditions for sewer service are met, including but not limited to: a) any expansion of MWRA sewer system shall strive for no negative impact on existing MWRA system sewer communities; and b) the proposed flows will not result in surcharging or other overflows in MWRA transport system. At this time, it is not apparent that these and other conditions can be met.

MWRA has requested that further consideration be given to non-MWRA wastewater management alternatives. MWRA has been assured that PHF- ND Colonial LLC and its consultants are investigating the various concerns raised and are further exploring various matters and alternatives. MWRA looks forward to further discussions to reach a balanced solution that addresses both MWRA concerns and the interests of the project. Please do not hesitate to contact Pam Heidell at (617) 788-1102 should you have any questions.

Sincerely,

Marianne Connolly

Marianne Connolly,
Program Manager, Regulatory Compliance

cc: Pam Heidell, MWRA
Ted Marsteiner, National Development
Theodore R. Tye, National Development
Robert Fishman, Nutter McClennen and Fish, LLP
Richard Stinson, Town of Wakefield
Michael Collins, Town of Wakefield

Mass Audubon
Protecting the Nature of Massachusetts

AC

October 10, 2007

Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
Ann Canaday, EOEA #14096
100 Cambridge Street, Suite 900
Boston, MA 02114

RECEIVED
OCT 11 2007
MEPA

Via fax: Anne Canaday, 617-626-1181
EOEA #14096, Meadow Walk at Lynnfield

Dear Secretary Bowles:

On behalf of Mass Audubon, the following comments are submitted on the Expanded Environmental Notification Form (EENF) for the Meadow Walk project in Lynnfield. Mass Audubon recommends that a full draft and final EIR be required. The EENF contains substantial information that reflects considerable cooperative planning by the town and the developer. The project is a 40R "smart growth" project with local support. Mass Audubon supports well-planned dense mixed use developments in appropriate locations, and is not opposed to this project.

However, the EENF falls short of the requirement of the MEPA regulations in regard to a request for a Single Environmental Impact Report (EIR) in several respects. First, it does not adequately present available baseline information. As detailed in the Saugus River Watershed Council's comments, the EENF does not reference or address the existing hydrology studies, fish monitoring programs or water quality analysis previously conducted by other organizations such as the Massachusetts Department of Environmental Protection, the Saugus River Watershed Council (SWRC), and the Massachusetts Division of Marine Fisheries. The EENF also does not adequately describe the effects of the project on important resources such as water quality and rare species. And, while a significant portion of the property is proposed to be excluded from the development area, the exact extent and management of remaining areas and wetland buffers and how they will be managed and protected is not clearly explained in the filing.

As noted by SWRC detailed sampling results and analysis of the Massachusetts Hazardous Waste site associated with Release Tracking #3-2655 that is located on the project site are not included in the EENF. Also, the EENF states that wastewater treatment options include on site treatment or transfer to the Massachusetts Water Resources Authority via sewer to Wakefield. At the September 20 MEPA site visit it was announced that an agreement has been reached with the Wakefield Board of Selectmen to proceed with the latter alternative. The EENF does not adequately explore the impact of these alternatives, including the impact on resources of transferring water out of the Saugus River watershed region; Wakefield sewage system's capacity to handle additional wastewater and construction impacts associated with linking the site to Wakefield's sewer system.

346 Grapevine Road ▲ Wenham, Massachusetts 01984 ▲ tel 978.927.1122 ▲ fax 978.922.8487 ▲ www.massaudubon.org

capacity to handle additional wastewater and construction impacts associated with linking the site to Wakefield's sewer system.

Therefore, Mass Audubon recommends that a full Draft and Final EIR be required. The Draft should fill in the gaps outlined above in the EENF, and provide more information regarding design alternatives and proposed mitigation measures.

Reedy Meadow is a 540-acre marsh of particular ecological significance. The Massachusetts Audubon Society has designated Reedy Meadow as an Important Bird Areas (IBA) due to its outstanding habitat value for a wide variety of birds including several state listed rare species. It is also a National Natural Landmark. The upper portions of the Saugus River watershed above the dam adjacent to the site provide drinking water for the City of Lynn. The river also supports fisheries including an American eel run documented in the spring of 2007 by the Massachusetts Division of Marine Fisheries and the Saugus River Watershed Council.

This is a large project located adjacent to a drinking water supply and significant, sensitive wetland habitats. The plans include a significant open space component, but the exact areas to be protected and the protection mechanisms and management plans are not included in the EENF. These issues were not handled as part of the pre-project negotiations and must therefore be fully addressed through the MEPA process.

The Draft EIR should document baseline conditions and evaluate the proposed design and potential refinements in relation to the resources. In order to meet the MEPA requirements for consideration of all feasible measures to avoid, minimize, and mitigate environmental impacts, the following items should be addressed in detail:

- Application of low impact development techniques and best management practices for both design and management. Categories include managing stormwater throughout the site, designing and managing "green buildings," and minimizing greenhouse gas emissions;
- Hazardous waste site impacts
- Expanded buffer zone along the perimeter of Reedy Meadow and the Saugus River, with plans for vegetation with native plants and long term management plan to ensure it's viability;
- Placement of a permanent conservation restriction on all of the proposed open space lands;
- Consideration of permanent protection with conservation restriction on the small parcel of land between the diversion canal and the Saugus River;
- Wastewater treatment and associated construction alternatives;
- Detailed plans for siting, design, construction and maintenance of replacement wetland

Scope for EIR

Mass Audubon recommends that the MEPA Scope for the EIR address the following resources:

- City of Lynn drinking water supply, including water quality and quantity and impacts of transferring wastewater off site to Wakefield/MWRA.
- Fisheries, including provision of trees and other vegetation along buffers to protect water quality and use of stormwater management designs and best management practices to minimize temperature increases and contamination associated with stormwater runoff.
- Woody and other vegetation throughout buffer areas on the proposed open space parcel.
- Open space and wetlands, including replacement wetland, public access and conservation restrictions.
- Air quality, including providing public transportation alternatives

Mass Audubon is interested in this project because of the potential short and long-term impacts to significant natural resources on and surrounding the project site, particularly the Reedy Meadow Important Bird Area, the Saugus River and the Lynn drinking water supply. We support the many smart growth features associated with the project, but request that the developer be required to submit a Draft and Final EIR to insure adequate review and planning to protect these important resources.

Thank you for considering our comments.

Sincerely,

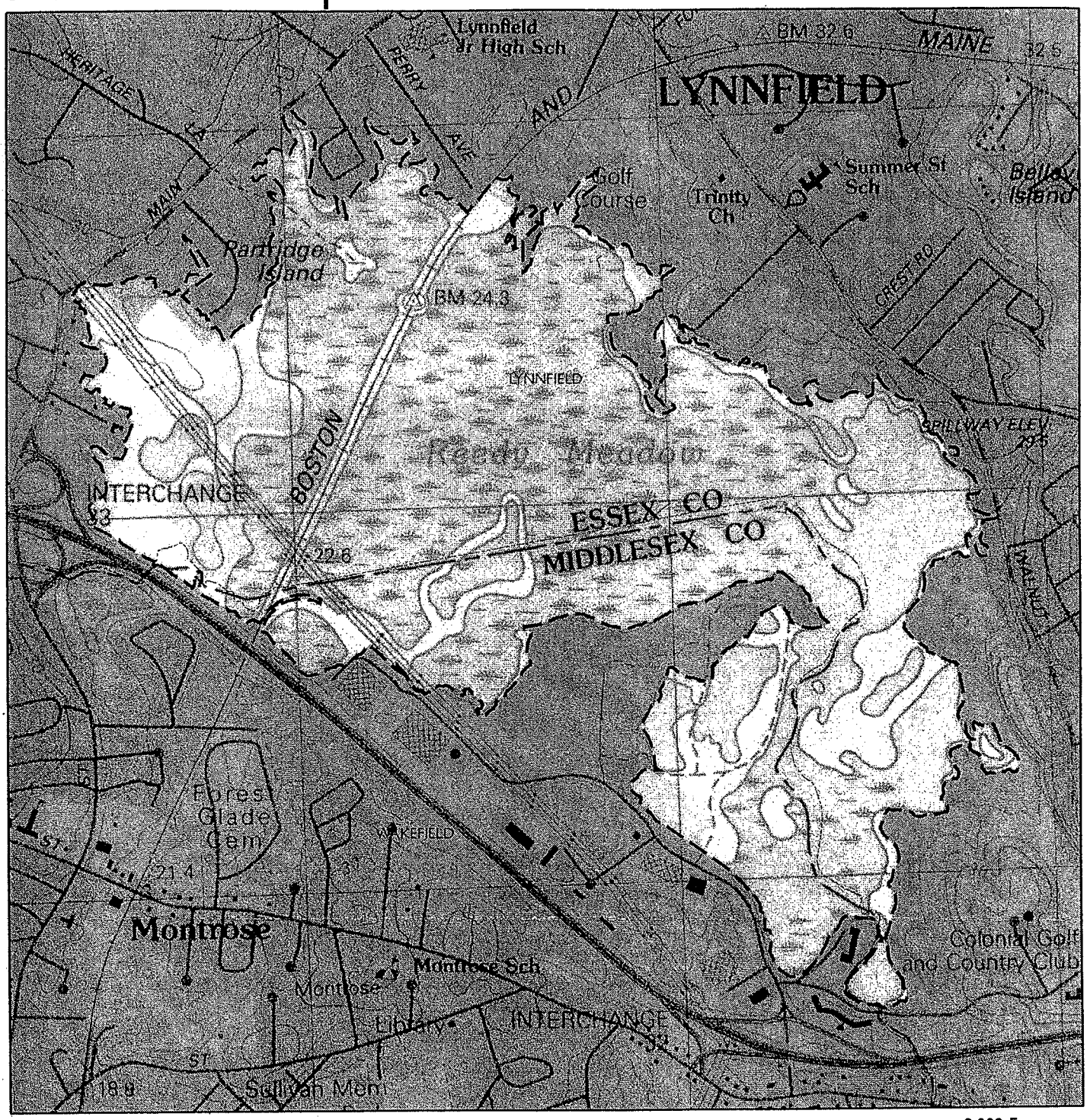
Kathryn W. Leahy

Kathryn W. Leahy
Director, North Shore Advocacy

cc: Felix Schwarz, VHB
Saugus River Watershed Council

Attachments: Important Bird Area (Reedy Meadow) brochure
Reedy Meadow Important Bird Area map

Massachusetts Important Bird Areas



Lynnfield Marsh

0 2,000 Feet

1:14,000

IBA Boundaries

Notes: IBA boundaries from Mass Audubon's IBA Program.
Base map (USGS quads and shaded relief, or 2001 color orthophotos) from MassGIS. Massachusetts State Plane, NAD83.
Map produced by Mass Audubon GIS Services, February 2007.

Mass Audubon
Protecting the Nature of Massachusetts

AC

BOARD OF SELECTMEN
WILLIAM J. LEE MEMORIAL TOWN HALL

THOMAS P. BUTLER
Town Administrator

1 LAFAYETTE STREET
WAKEFIELD, MASSACHUSETTS 01880
(781) 246-6390
FAX (781) 246-2400

October 5, 2007

RECEIVED
OCT 10 2007
MEPA

Secretary Ian Bowles
Attn: Anne Canaday
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2524

RE: Meadow Walk at Lynnfield (EOEA #14096)

Dear Secretary Bowles:

On behalf of the Wakefield Board of Selectmen, I am writing to express Wakefield's support for the Meadow Walk at Lynnfield redevelopment project and the Proponent's recent request for a Single Environmental Impact Report.

Since the proposed project is partially located in the Town of Wakefield, we have spent a great deal of time and effort reviewing the scope and potential impacts from the Meadow Walk project. Over the past six to eight months, we have been working closely with the Proponent to identify the ways in which the Proponent will mitigate the Town's traffic, storm water and wastewater concerns. To date, these efforts have included the following:

- The development of an Amended and Restated Sewer Agreement between the Proponent and Town of Wakefield, establishing the terms under which the Town of Wakefield will allow Meadow Walk to discharge increased wastewater flows to the Wakefield municipal system. The form of this agreement was approved by the Wakefield Board of Selectmen on August 27, 2007. The agreement is currently under review by the Massachusetts Water Resources Authority ("MWRA") into whose sewer system the Town's sewer system connects.

- The Town hired a peer review consultant, Jacobs Edwards and Kelcey, to complete a comprehensive transportation peer review which identified potential traffic impacts and evaluated the adequacy of the proposed transportation system improvements designed to address these impacts. Some minor modifications were made as a result of this peer review but overall the peer reviewer found the Proponents evaluation and improvements to be "conservative".
- Town has held several stormwater-related working sessions with the Proponent's engineering team to establish design procedures and standards to mitigate stormwater impacts from the Project on the Town. These mitigation measures are being incorporated into the project design.
- The Town is currently in the final stages of negotiating a Traffic and Storm Water Mitigation Agreement with the Proponent which will address the traffic and storm water mitigation requirements from the Town.

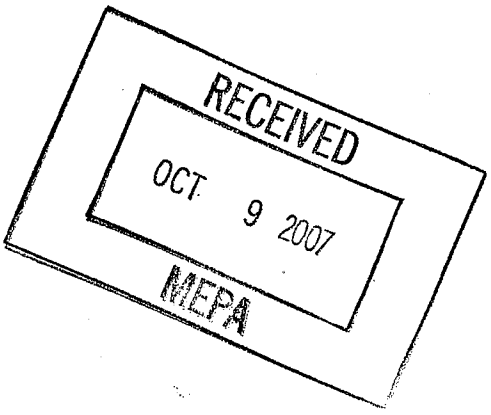
Conditioned upon the finalization and execution of the Amended and Restated Sewer Agreement and a mutually acceptable Traffic and Storm Water Mitigation Agreement, the Town of Wakefield supports the Meadow Walk at Lynnfield redevelopment project. The Proponent has consistently demonstrated a willingness to cooperate in finding solutions to satisfy the Town's concerns and we are confident that this relationship will continue through the development of the Meadow Walk project.

Sincerely,

Thomas Butler
Town Administrator

AC

October 8, 2007



Meadow Walk at Lynnfield

Secretary Ian Bowles
Secretary of Energy and Environmental Affairs
Execututive Office of Energy and Environmental Affairs
Attn: Ann Canaday, EEA No. 14096
100 Cambridge Street, Suite 900
Boston, MA 02114

Dear Secretary Bowles,

I very much appreciate the opportunity to review and comment on the proposed Meadow Walk at Lynnfield project. In general, I support the wise development of this property, which I believe is the intent of the project proponents and the communities involved. However, I do have some very serious concerns with the sewer and stormwater plans, which I believe can be fixed. In this letter I will outline my concerns with the sewer and stormwater plans, and then will suggest ways the problems can be resolved.

Sewer

The current plan is to discharge all wastewater to the Town of Wakefield's system.. There are two issues with this plan: available sewer capacity and inter-basin transfer of water.

Sewer Capacity. The proponents cite a sewer capacity study from the Town of Wakefield as evidence that the existing system has sufficient capacity. What is not mentioned in the document is that wastewater flow from this area would flow to a pumping station in Wakefield, and then to the Massachusetts Water Resources Authority's (MWRA) interceptor system. It is highly unlikely that the pumping station can handle existing flows, such as occurred during March 1993, October 1996, June 1998, March 2001, April 2004, May 2006, and possibly several other storm events. Even if the capacity of the pumping station was not exceeded during these storms, the capacity of the MWRA system downstream of the pumping station in Melrose has been, resulting in extensive overflows. Thus, every additional drop of water from the proposed project will exacerbate existing flooding in either the Wakefield or in the MWRA collection systems, particularly in Melrose. The proponents may not be aware of this limitation and should contact the MWRA and the town of Melrose for additional information on sewer overflows downstream of the proposed project. It is a major problem. The overflow in Melrose most recently occurred in May 2006 and April 2007, and probably occurs on average every year or two.

The proponents may also claim that they will remove sufficient infiltration / inflow (I/I) to justify adding additional flows. In particular, on page 4-7 of the ENF, the proponents note inflow from roof drains and a manhole in the hotel parking lot will

be removed as part of the project. This existing illegal I/I should be removed immediately, even if the project does not go forward. The remediation of existing illegal I/I on-site should not be used as justification for adding additional flow to an overloaded system. The proposed project will add new sources of I/I that will off-set any reductions in the existing system. The success of any future I/I removal elsewhere in Wakefield should be documented by careful flow monitoring during large storm events before it is used as justification for adding additional flows to an overloaded system.

Inter-Basin Transfer. The second problem with the proposed sewer plan is that it results in an inter-basin transfer of water. The majority of the project is located in the community of Lynnfield, MA, which will supply the potable water. The connection of the Meadow Walk wastewater system to the MWRA system via the Wakefield sewer system results in an inter-basin transfer of water from the Saugus River watershed to Boston Harbor. It is important to prevent inter-basin transfers of water in order to ensure the local rivers have sufficient water during dry periods.

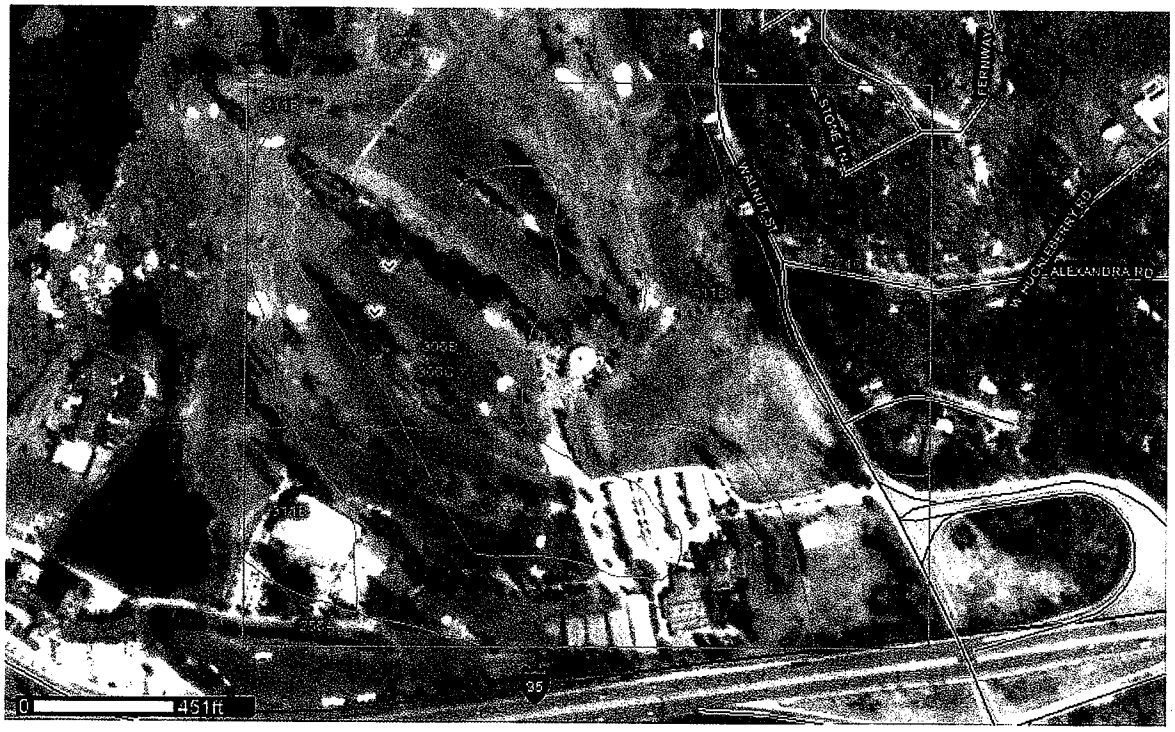
Stormwater

The stormwater discharged from the project enters the Saugus River, which is severely affected by flooding. During the May 2006 flood, portions of Route 1 were closed as a result of the flooding. Because of the duration of the flooding, the peak runoff flow from the proposed project is less important than the total runoff volume. The proponents have attempted to design the stormwater system so that the total volume after the development will be less than or equal to the total volume before development. This is the correct approach. However, the proponents have made some assumptions in their stormwater calculations that may need to be revised, and these are discussed below.

Infiltration Rate. The infiltration rate specified in the model appears to be too high. The soil map in the report is very poor quality and is difficult to read. It is reprinted below for clarity. As described in Table 1.2 of the Drainage Report in Attachment G, most of the site is comprised of soils with hydrologic classification of C (soil types 311B, 306B, 306C). As described on page 5 in Appendix D of Attachment G, hydrologic soil group C soils have a "slow rate of water transmission".

Appendix A of this letter contains a copy of the guidance from the HydroCAD modeling software for selecting infiltration rates based on hydrologic soil group. This is the software used by the proponents. For type C soils, the guidance is as follows:

> Group C: soils have low infiltration rates when thoroughly wetted and consist chiefly of soils with a layer that impedes downward movement of water, and soils with moderately fine to fine texture. These soils have a low rate of water transmission (0.05-0.15 in/h).



Soil Units in Project Area

To reduce peak flows and runoff volumes, the stormwater system utilizes a total of 12 ponds, rain gardens, or underground storage units, and these are listed in Table 1. The data in Table 1 was obtained from the HydroCAD model files contained in Appendix A of Attachment G.

As shown in Table 1, the infiltration rate specified in the model for most of the ponds, rain gardens, and infiltration basins is 7.5 inches per hour. This is a constant rate that occurs over the surface area of the water. This is equivalent to 15 feet of water per day in the vertical direction, which may be appropriate for type A soils, but is unlikely to be achieved in areas with type C soils except perhaps during the beginning of a storm. After the soil becomes saturated, the rate of infiltration will decrease substantially, to a value on the order of 0.1 in/hour. This would reflect the infiltration rate after the soil becomes saturated, such as would occur during an extended rain. The value used in the ENF is applicable only during the first part of the storm, but was applied for the entire storm. Referring to Appendix A of this letter, even if the soils were hydrologic group B and had an infiltration rate of 0.3 inches per hour, the value of 7.5 inches per hour specified in the model is 25 times higher than the value recommended by the HydroCAD Technical Reference manual (the values in the HydroCAD Technical Reference manual are from the Soil Conservation Service TR-55

manual). Based on the HydroCAD Technical Referance manual, the infiltration rate should be 0.05 to 0.15 inches per hour for type C soils.

Table 1. Summary of Ponds / Rain Gardens / Subsurface Storage Modeling Information

Pond / Rain Garden / Storage ID	Peak Elev. For 100-year Storm (feet)	Surface Area at Peak Elevation (square feet)	Bottom Elevation (feet)	Infiltration Rate (inches per hour)
P-1B	91	21245	88	0
P-1C	90	33579	86	0.375
P-1D	85.87	34397	83	0
P-1E	83	13063	80	7.5
P-3B	81.16	3802	78	7.5
P-5A	87	36153	84	7.5
RG1E	88.96	1789	88	7.5
RG2E	87.89	1707	87	0.375
S-3A	95.99	22200	92	0
S-4A	94.51	19800	92	7.5
S-B1	75.97	450	74	7.5
S-B2	75.97	450	74	7.5

The proponents may try to justify a higher infiltration rate based on a percolation test. However, there are many factors that could lead to a high infiltration rate during a percolation test, such as the length of the test. If the percolation test were conducted for a longer period, then the rate may decrease. If the infiltration rate actually is 7.5 inches per hour, then that means the soil data is incorrect and the soils are actually type A. In this case, the modeling should be re-done with curve numbers selected based on type A soils. The proponents cannot have it both ways. If type C soils are used to select curve numbers for existing conditions (which results in more runoff compared to type A soils) then type C soils should also be used for specifying infiltration rates in the ponds.

Subcatchments Modeled Incorrectly for Post-Development Conditions. For existing conditions, the open water or ponds were modeled using a curve number of 100. This is the correct procedure because 100 % of the rain that falls on water or wetlands contributes to an increase in the water level. For post-development conditions, the proponents neglected to include the ponds in the curve number calculations. As was done for existing conditions, the ponds should have been modeled using a curve number of 100. As shown in Table 1,

based on the model results for the 100 year storm in Appendix A of Attachment G, a substantial amount of area (188,635 square feet or 4.3 acres) will be submerged during the 100 year storm. This area should have been modeled using a curve number of 100 to account for the fact that 100 % of the precipitation that falls on the pond enters the pond. The model should be corrected and rerun.

Free Discharge Assumed at Outfalls. Free discharges were specified in the model at all of the ponds. This means that the water level in the ponds, rain gardens, and underground storage units are not influenced by backwater from the receiving water. Based on the model files in Appendix A of Attachment G, the inverts of the outlets range from 86 feet to 73 feet. To confirm that the outlets are not influenced by backwater from the receiving water, the proponents should assess the peak elevation in Reedy Meadow during a 100-year storm. The water elevation in Reedy Meadow is controlled by the weir structure on the Saugus River at the Sheraton Hotel. It should be possible to estimate the peak flow at the weir based on adjusting the peak flows recorded at the USGS stream gage downstream by tributary area. The peak elevation at the weir can then be estimated based on a weir equation. The HydroCAD software used by the proponents has the capability to account for variable tailwater. A table clearly showing the bottom elevation of the pond, the groundwater elevation, the peak elevations in the receiving water, and the outlet elevation should be prepared. If necessary, the model should be revised to include a boundary condition.

Groundwater Mounding not Assessed. As was shown in Table 1 above, the bottom elevation specified in the model for the ponds, rain gardens, and subsurface storage units range from 74 feet to 88 feet. Infiltration is being modeled at a rate of 7.5 inches per hour. As shown in Table 1 of the Sanborn, Head, and Associates *Preliminary Hydrogeological Summary* report in Appendix D of Attachment G, groundwater across the site ranges from 69.9 feet to 95.5 feet. A groundwater mounding study should be performed to confirm that sufficient clearance exists between the bottom of the storage units and the groundwater elevation, assuming an infiltration rate of 7.5 inches per hour.

Recharge Area and Water Quality Calculations are Incorrect. Appendix B contains recharge and water quality calculations. These results appear to be based on a different version of the model than the one contained in Appendix A of Attachment G. For example, the calculations in Appendix B use a bottom elevation of 88 and an outlet elevation of 89.5 feet for Pond 1-B, while the same pond in Appendix A was modeled with an outlet elevation of 88 feet instead of 89.5 feet. Comparing Appendices A and B indicates ponds 1B, 1C, and 1D are not consistent. The calculations in Appendix B should be redone so that they are consistent with Appendix A.

Soil Map not Readable in Appendix D. The soil Map in Appendix D of Attachment G is not readable and should be re-done as it is impossible to confirm that the calculations which used the data in the map were done correctly.

Exploration Location Plan not Readable in Appendix D. The location plan in the Sanborn, Head, and Associates *Preliminary Hydrogeological Summary* report is not readable, even with a magnifying glass. This figure is very important because it is the only way to correlate the hydrogeologic data with the site. The figure should be redone.

Pond Naming Inconsistent in Preliminary Hydrogeological Summary. Although it is difficult to read, the ponds labeled in the location plan of the Sanborn, Head, and Associates *Preliminary Hydrogeological Summary* report in Appendix D of Attachment G appear to be inconsistent with the pond naming convention used in Appendix A. For example, the pond on the eastern side of the site appears to be labeled as Pond 2, while in Appendix A this pond appears to be modeled as Pond 5-A. The figure should be redone so that it is consistent with Appendix A and clearly labels the ponds.

Percolation Tests Difficult to Interpret in Appendix D. Table 6 of the Sanborn, Head, and Associates *Preliminary Hydrogeological Summary* report in Appendix D of Attachment G contains a summary of the percolation test results. The percolation test results are difficult to interpret because they do not give any indication of the duration of the tests. Also, the infiltration rates specified in the table appear to be incorrect. For example, test pit location 1A has a infiltration rate specified as 3 inches per hour and 36 feet per day. The rate of 36 feet per day appears to be incorrect. A rate of 3 inches per hour is equivalent to 6 feet per day, not 36 feet per day as stated in the table.

Design Criteria Document Referenced in Appendix D Not Included. The Sanborn, Head, and Associates *Preliminary Hydrogeological Summary* report in Appendix D of Attachment G references a table titled *Test Pit Information for Drainage Calculations*. This table is not in the ENF and should be included so that it can be reviewed.

Recommended Modifications

The proposed sewer and stormwater plans are not adequate and should be redone. The sewer plan should incorporate on-site treatment and infiltration, and the stormwater plans should utilize more conservative assumptions. To accomplish this, the project should utilize more of the site for managing the sewer and stormwater flows. The proponent has offered to donate 103 acres of land to be used as permanent open space for a golf course. An analysis of this land should be performed to determine if it can be used to manage the sewer and stormwater flows. For example, it may be possible to use a portion of the land for additional infiltration area and still operate the property as a golf course.

I am very interested in this project and would appreciate the opportunity to review the responses and any changes to the plan. I believe this project can go forward if appropriate modifications are made to the sewer and stormwater plans. Please feel free to contact me if you need additional information.

Sincerely,

Lawrence Soucie

4 Allston Road
North Reading, MA 01864

Appendix A

Appendix A1 from HydroCAD Technical Reference Manual Containing Information on Hydrologic Soil Groups

Appendix A1: Hydrologic Soil Groups

Hydrologic soil groups

Soils are classified into hydrologic soil groups (HSG's) to indicate the minimum rate of infiltration obtained for bare soil after prolonged wetting. The HSG's, which are A, B, C, and D, are one element used in determining runoff curve numbers as listed on the following pages.

The infiltration rate is the rate at which water enters the soil at the soil surface. It is controlled by surface conditions. HSG also indicates the transmission rate — the rate at which the water moves through the soil. This rate is controlled by the soil profile. The four groups are defined by SCS soil scientists as follows:

Group A soils have low runoff potential and high infiltration rates even when thoroughly wetted. They consist chiefly of deep, well to excessively drained sands and gravels, and have a high rate of water transmission (greater than 0.30 in/hr).

Group B soils have moderate infiltration rates when thoroughly wetted, and consist chiefly of moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission (0.15-0.30 in/hr).

Group C soils have low infiltration rates when thoroughly wetted, and consist chiefly of soils with a layer that impedes downward movement of water, and soils with moderately fine to fine texture. These soils have a low rate of water transmission (0.05-0.15 in/hr).

Group D soils have high runoff potential. They have very low infiltration rates when thoroughly wetted, and consist chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission (0-0.05 in/hr).

> Note: A complete list of soil types for the United States is included in the HydroCAD Help system, and on the HydroCAD support page at www.hydrocad.net.

Disturbed soil profiles

As a result of urbanization, the soil profile may be considerably altered and the listed group classification may no longer apply. In these circumstances, use the following to determine HSG according to the texture of the new surface soil, provided that significant compaction has not occurred:

HSG	Soil Textures
A	Sand, loamy sand, or sandy loam
B	Silt loam or loam
C	Sandy clay loam
D	Clay loam, silty clay loam, sandy clay, silty clay, or clay

This appendix reprinted from S.C.S. TR-55, revised 1986.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Deval L. Patrick
GOVERNOR

Timothy P. Murray
LIEUTENANT GOVERNOR

Ian A. Bowles
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

April 11, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY & ENVIRONMENTAL AFFAIRS
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Meadow Walk at Lynnfield
PROJECT MUNICIPALITY	: Lynnfield and Wakefield
PROJECT WATERSHED	: North Coastal
EOEA NUMBER	: 14096
PROJECT PROPONENT	: PHF-ND Colonial, LLC
DATE NOTICED IN MONITOR	: February 20, 2008

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and Section 11.08 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **adequately and properly complies** with MEPA and its implementing regulations. I am allowing the proponent to file the Final Environmental Impact Report (EIR) as a response to comments document. The next edition of the Environmental Monitor, published on April 23, 2008 will include a notice that the response to comments and Section 61 Findings will be filed, circulated and reviewed as a Final EIR.

Project Description

As described in the Expanded Environmental Notification Form (EENF) and the Draft EIR, the project consists of the construction of a mixed-use development on a 203-acre parcel in Lynnfield and Wakefield. It will include 395,000 square foot (sf) of retail space, 80,000 sf of office space, and 220-residential units. The housing will consist of 180 rental apartments (including 45 affordable units). In addition, six acres of land will be purchased by the Lynnfield Initiative for Elders (LIFE) for development of 40 units of moderate income housing for seniors.

The project includes retention of the northern half of the golf course as a 9-hole golf course and construction of a new club house. The remainder of the golf course (including the existing club house) and the conference center will be demolished. The project includes improvements to the access drives, construction of an internal roadway system, construction of 2,718 additional parking spaces and installation/expansion of associated infrastructure and utilities, including a stormwater management system. The project is being developed under M.G.L. Chapter 40R Smart Growth Zoning and Housing Production legislation.

According to the EENF, potential environmental impacts include the creation of 38.2 acres of new impervious surfaces, alteration of 1,700 square feet (sf) of Bordering Vegetated Wetlands (BVW), alteration of 400 linear feet (lf) of bank, alteration of 2,150 sf of Land Under Water (LUW), 16,000 sf of Bordering Land Subject to Flooding (BLSF) and 600 feet of Riverfront Area (RA), and generation of approximately 19,079 average daily vehicle trips (adt) on a weekday, use of an additional 73,770 gallons per day (gpd) of water and generation of an additional 76,350 gpd of wastewater.

As described in the EENF, the site is bounded by Interstate 95 (I-95)/Route 128 and the Saugus River to the south, Audubon Road in Wakefield to the west, Walnut Street in Lynnfield to the east and Reedy Meadow to the north. The site contains an 18-hole golf course including a clubhouse and maintenance buildings, a 54,000 sf conference center, a 55,000 sf Boston Sports Club, 181,400 sf Sheraton Hotel and 975 parking spaces. The site has immediate highway access from I-95/Route 128 via Exit 42 (Pleasure Island Road) and Exit 43 (Walnut Street). The Saugus River provides habitat for the passage of the American eel (Anguilla rostrata), riffle habitat for spawning rainbow smelt (Osmerus mordax) and habitat for the passage, spawning and juvenile development of river herring (Alosa pseudoharengus and Alosa aestivalis). Reedy Meadow is a 540-acre freshwater marsh that has been designated by the National Park Service (NPS) as a National Natural Landmark. According to the 12th Edition of the Massachusetts Natural Heritage Atlas, the project is located within Priority and Estimated Habitats of Rare Species, including habitat for the American Bittern (Botaurus lentiginosus), the Common Moorhen (Gallinula chloropus) and the King Rail (Rallus elegans).

MEPA Jurisdiction and Required Permits

The project is undergoing review and requires preparation of an EIR pursuant to sections 11.03 (1)(a)(1), (1)(a)(2), (6)(a)(6) and (6)(a)(7) of the MEPA regulations, because the project requires state permits and will alter more than 50 acres of land, create more than 10 acres of new impervious surfaces, generate 3,000 or more new adt on roadways providing access to a single location and construct 1,000 or more new parking spaces at a single location. The project requires a Sewer Connection/Extension Permit and a 401 Water Quality Certificate from the Department of Environmental Protection (MassDEP). It requires an Access Permit from the Massachusetts Highway Department (MassHighway). The project requires the amendment of a sewer agreement with the Massachusetts Water Resources Authority (MWRA). Also, the project requires Orders of Conditions from the local conservation commissions in Lynnfield and

Wakefield. The project must comply with the United States Environmental Policy Act (EPA) National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges from a construction site of over five acres.[1]

Because the proponent is not seeking financial assistance from the Commonwealth for the project, MEPA jurisdiction extends to those aspects of the project that may have significant environmental impacts and that are within the subject matter of required or potentially required state permits. In this case, MEPA jurisdiction exists over land alteration, traffic/transportation, air quality, wetlands, drainage, rare species and wastewater.

Review of the Draft EIR

The Draft EIR includes a thorough description of the entire project and all project elements and construction phases. The Draft EIR includes plans that depict existing conditions, including resources and abutting land uses, and proposed conditions including elevations, structures, access roads, stormwater management systems and sewage connections. The Draft EIR includes an alternatives analysis, additional traffic analysis, a stormwater management plan, a greenhouse gas analysis and additional information to help reviewers understand the project, its potential environmental impacts and identification of measures to avoid, minimize and mitigate these impacts. As required, the Draft EIR includes a site circulation plan illustrating how motor vehicles, pedestrians and cyclists will be accommodated on the site. It indicates that the project will be constructed in a single phase. It identifies mitigation measures and includes a Response to Comments section.

The Draft EIR identifies changes in the project design and additional mitigation measures to minimize impacts to wetlands, rare species and fisheries. The revised plan maximizes the amount of undisturbed buffer zone between project elements and wetland resources including Reedy Meadow and the Saugus River. Revisions include the reorientation of residential buildings and elimination of a detention basin to significantly increase the buffer zone between the project site and Reedy Meadow. A 25-foot buffer has been added between Reedy Meadow and the golf course and a 150-foot buffer will be provided on the east side of the Saugus River. The proponent will restore and re-vegetate the buffer around Reedy Meadow and re-vegetate areas around the Saugus River. The Draft EIR indicates that 114 acres of the site, including the newly established buffer zones, will be permanently protected through placement of a Conservation Restriction on the property. The Draft EIR includes draft language for the Conservation Restriction. The proponent has committed to provide $25,000 to fund a feasibility study to address the practicality of raising the summer water levels in Reedy Meadow for the benefit of state-listed marsh birds. A multi-use path will be constructed around Reedy Meadow and pervious pavement will be used within the residential areas to minimize stormwater impacts. To mitigate the direct wetland impacts and loss of flood storage, the proponent will provide a single wetland replacement area.

[1] NHESP comments indicate that the project will not result in a "take" of a rare species; therefore, a Conservation and Management Permit is not required.

These changes are consistent with comments provided by NHESP, Division of Marine Fisheries (DMF), Mass Audubon and the Saugus River Watershed Council. NHESP comments on the Draft EIR and correspondence to the proponent indicate that the project will not result in a prohibited "take" of state-listed rare species. This determination is based on the implementation of mitigation identified in the Draft EIR and dependent upon several conditions, including the provision of a draft recordable Conservation Restriction Plan by the proponent to NHESP for review. Comments from the Saugus River Watershed Council indicate that, although significant positive progress has been made, additional work is needed to identify mitigation elements and the letter identifies opportunities for expanded mitigation measures, such as creation of a re-vegetated buffer on the western side of the Saugus River.

The Draft EIR identifies and describes wetland impacts associated with the project and includes a Stormwater Management Plan (SMP). The SMP includes the use of rain gardens, vegetated swales and a dispersed system that is intended to maintain and mimic existing hydrologic functions. It includes deep sump and hooded catch basins, water quality inlets, vegetated biofiltration swales and detention basins. Groundwater recharge will be provided via infiltration basins, rooftop runoff, porous asphalt and permeable pavers. Because the Notices of Intent (NOI) for the project were filed after January 2, 2008, the project is subject to the revised stormwater management standards. These standards have been incorporated into the Wetlands Protection Act Regulations (310 CMR 10.05(6)(k)) and the Water Quality Certification Regulations (314 CMR 9.06(6)(a)). The Draft EIR does not acknowledge that the project must comply with the revised standards or demonstrate its compliance with these standards. Comments from MassDEP identify several areas where the SMP does not appear to comply with the revised stormwater standards. Also, I note that the Draft EIR does not address the project's overall consistency with the Water Quality Certification Regulations as a whole or include a Section 61 Finding for the 401 Water Quality Certificate.

The project will alter approximately 83 acres of the site and create an additional 38.2 acres of new impervious surfaces for a total of 52.2 acres on the site. A significant amount of alteration is associated with the restoration of the buffer zone (6 acres) and changes to existing impervious surfaces (14 acres). Efforts to minimize the amount of impervious surfaces and associated impacts include locating 192 parking spaces under buildings, the use of pervious pavement for streets and sidewalks and use of second stories within the retail/commercial are of the site. The Draft EIR identifies the amount of excavation and fill planned on the site and indicates that the project may include blasting where bedrock is encountered. The document does not provide a blasting plan although it does provide general guidance and procedures associated with blasting. The Draft EIR indicates that perchlorate-containing blasting agents will not be used.

The EENF included a traffic study that, according to the Executive Office of Transportation (EOT), conforms to the EEA/EOT Guidelines for EIR/EIS Traffic Impact Assessment. The project is estimated to generate approximately 19,079 unadjusted average daily vehicle trips (adt) using appropriate Institute for Traffic Engineers (ITE) land use codes and 15,079 adt when adjusted for internal shared trips and pass-by trips. The EENF identified

significant issues with existing traffic capacity, identified roadway improvements planned by others to alleviate existing congestion and identified roadway improvements planned by the project proponent to mitigate impacts associated with its project. Improvements are proposed at the Audubon Road/Colonial Golf Club Driveway intersection, the Audubon Road/I-95 southbound ramps intersection, the Walnut Street/Salem Street/I-95 northbound ramps intersection, and the Walnut Street/I-95 southbound ramps/Colonial Golf Club Driveway intersection. These improvements consist mainly of geometric improvements, traffic signal installation, and traffic signal coordination. The Draft EIR provides additional traffic analysis for areas identified by EOT, including Route 1/Salem Street intersection, Route 128/Walnut Street and Salem Street/Audubon Road, and provides a response to EOT comments. The Draft EIR includes conceptual designs for the roadway improvements and identifies right-of-way (ROW) implications. Comments from EOT indicate that the project has provided adequate information and analysis regarding traffic impacts and proposed improvements and identifies several issues that should be addressed through the project's Section 61 Findings, including signal coordination, interim mitigation and strengthening of the Transportation Demand Management (TDM) Program.

The Draft EIR includes a mesoscale air quality analysis prepared in conformance with MassDEP Guidelines for Performing Mesoscale Analysis of Indirect Sources. Because this analysis demonstrates that hydrocarbon emissions for the 2012 Build scenario (207 kilograms per day (kpd)) exceed the 2012 No Build scenario (199.5 kpd) by 7.5 kgd, the proponent is required to provide mitigation for air quality impacts including the development of a TDM program. The proposed roadway improvements analyzed for the Build with Mitigation scenario includes roadway improvements and demonstrates a reduction of 1.3 kpd from the Build scenario. The TDM Program includes: an on-site Transportation coordinator, bicycle and pedestrian accommodations, a shuttle service for senior citizens, the provision of ZIP Car service and employer-based TDM measures. Several comment letters urge the proponent to establish shuttle service to the Andersen Regional Center (ARC) in Woburn as an effective method of strengthening its TDM Program and minimizing vehicle trips associated with the project.

In addition to the mesoscale analysis, the Draft EIR includes a revised greenhouse gas (GHG) analysis, provided on a voluntary basis. This analysis identifies the project's total emissions of carbon dioxide (CO_2). I applaud the proponent for conducting this analysis and its intention to incorporate measures to reduce GHG emissions into its project design and operation. Efforts to reduce GHG emissions include the following: use of highly-reflective roofing materials for 75% of flat roofs in the commercial and office buildings, maximize interior daylighting through floor plates, increased perimeter and use of skylights and light wells in commercial and office areas, window glazing to balance and optimize daylighting, heat loss and solar heat gain performance in all buildings, use of high-efficiency HVAC systems in commercial and office areas, elimination of refrigerants in HVAC systems, incorporation of motion sensors, lighting and climate control in all public areas, use of efficient, directed exterior lighting for all buildings, provision of construction and design guidelines to support sustainable design for tenant build-out. In addition, measures to protect natural resources and transportation mitigation identified previously will provide additional GHG reductions. The Draft EIR identifies a combined direct

and indirect CO_2 reduction of approximately 12.6 percent. Comments encourage the proponent to make a firm commitment to offset its GHG emissions and identify additional measures for consideration.

The Draft EIR confirms that the project will increase wastewater flow by 73,770 gpd for a total of 122,010 gpd of wastewater flow. The Draft EIR indicates that the proponent has been engaged in detailed discussions with the MWRA and the Town of Wakefield regarding discharge of its wastewater to the Wakefield municipal system and how to address the capacity of the system downstream. The Draft EIR indicates that these discussions have focused on the identification of impacts on downstream MWRA communities, including the City of Melrose, and development of an adequate mitigation package. As a result of these discussions, the proponent has committed to fund a study of infiltration and inflow (I/I) sources on the project site, provide funds to identify and remove infiltration and inflow in Wakefield (on-site and off-site) and to redirect sewer flows in Melrose to relieve surcharge and overflow conditions. A formal agreement has been established between the proponent and the Town of Wakefield (and approved by the Wakefield Board of Selectmen). The proponent is working with the Massachusetts Water Resources Authority (MWRA) to finalize an amended sewer agreement. The Draft EIR does not include any details regarding how I/I will be removed or how flows in Melrose will be redirected. Comments from MassDEP indicate that the proponent will need to commit to removal of I/I on a 4:1 basis for the Sewer Connection Permit application.

Water service will be provided by Wakefield and Lynnfield, both of which are members of the MWRA water service area. The proponent has indicated that water conservation measures will be incorporated into the project design as part of an overall effort to construct sustainable buildings. The Draft EIR indicates that the proponent will employ zeriscaping and incorporate drought tolerant, native species in the landscaping plan to minimize associated water use.

The Draft EIR identifies potential construction period impacts and identifies measures to avoid, minimize and mitigate these impacts. The Draft EIR indicates that the proponent may use a contractor that is participating in the MassDEP Diesel Retrofit Program to minimize construction related air quality impacts.

Comments from the Town of Lynnfield and the Town of Wakefield reiterate the extensive amount of planning and review conducted as part of the 40R process, identify additional progress since the filing of the EENF and express strong support for the project and the ability of the project proponent to work constructively to address any outstanding issues. Although the Draft EIR does not meet the standards for a rollover to a Final EIR, I acknowledge and appreciate the progress that has been achieved on project planning and mitigation. Because agreement appears to have been reached on most of the most of the major issues identified in the Certificate on the EENF and outstanding issues are limited to demonstration of compliance with the revised stormwater standards and specification of mitigation commitments, several of which have been better developed and defined through local review processes, the proponent may prepare the Final EIR as a Response to Comments document. The next edition of the Environmental Monitor, published on April 23, 2008 will include a notice that the response to

comments and Section 61 Findings will be filed, circulated and reviewed as a Final EIR.

The Final EIR should contain a copy of this Certificate and a copy of each comment received. This directive is not intended to, and shall not be construed to, enlarge the scope of the Final EIR beyond what has been expressly identified in the initial scoping certificate or this Certificate. Each comment letter should be reprinted in the Final EIR and the Final EIR should respond to the comments received to the extent that the comments are within the subject matter of this Scope.

Issues for the Final EIR

Wetlands, Drainage and Fisheries

The March 31, 2008 comment letter from DMF identifies the need for more information regarding design and construction of proposed improvements which is consistent with comments from MassDEP and the Saugus River Watershed Council. In addition, the DMF comments indicate that in-water silt producing work should be prohibited from February 15 through June 30 and that adequate fish passage should be maintained from September 1 until October 15th to protect migration of eels. Comments from the Saugus River Watershed Council request that the project proponent improve stormwater management and increase vegetation along the Wakefield side of the Saugus River as well as incorporate additional vegetation into the roadway widening project to minimize stormwater impacts and provide shade for fisheries. According to a second comment letter from DMF, dated April 7, 2008, the proponent did provide additional information regarding construction sequencing and phasing after reviewing DMF's original comment letter. This information was developed during local review of the project.

The Draft EIR identifies wetland alterations associated with the expansion of the secondary access drive from 19 feet to 26 feet. It will alter 210 square feet of LUW, 300 lf of Bank, 1,380 sf of BVW Wetland, 610 square feet of new development in the RA, and 22,650 square feet of land in BLSF. The Final EIR should provide more detailed information regarding the widening of the Saugus River crossing. It should clearly describe the proposed improvements, construction sequencing and design and mitigation. It should identify when water flow would be interrupted and how fish passage will be maintained, in particular from September 1 until October 15th. This additional information should be included in the Final EIR and relevant commitments and mitigation should be incorporated into the project's Section 61 Findings. It should respond to the Saugus River Watershed Council's comments regarding improved buffer zones.

The Final EIR should address all of the comments from MassDEP regarding the SMP and its consistency with the revised stormwater management standards including: revised recharge calculations, updated infiltration rates for the hydrologic soils, use of water quality swales for infiltration, depth to groundwater below the proposed infiltration basins and trenches, number of test pits required for infiltration systems, TSS calculations and requirements for new

development and redevelopment. It should address MassDEP comments regarding the floodplain boundary and whether the proposed replacement wetland meets the standards for flood storage. Also, it should address the Saugus River Watershed Council's comments regarding construction procedures, erosion and sediment control, salt use, snow management and use of pesticides and fertilizers. This information may be provided in a summary from in the document; however, a copy of the revised SMP should be provided to MEPA, MassDEP, the Saugus River Watershed Council and to any other commentor who requests it.

The Scope for the Draft EIR required an assessment of wildlife and fisheries habitat based on existing hydrology studies, fish monitoring programs and water quality analysis conducted by others. The Draft EIR does not provide this assessment although it does note that improvements to water quality and increases in recharge to support aquatic habitat are goals identified in the studies. Comments from the Saugus River Watershed Council call for the establishment of baseline water quality conditions and on-going monitoring to assess the impact of the project on the Ready Meadow and the Saugus River. None of the state permitting agencies have indicated that baseline water quality should be established or request additional information regarding wildlife and fisheries habitat nor have they indicated that these will be a condition of permitting. I encourage the proponent to consult with the Saugus River Watershed Council regarding this request and determine whether existing data collected by the Saugus River Watershed Council may be supplemented and on-going monitoring incorporated into the project. I note that the Council has offered assistance in developing the scope and identifying appropriate equipment and procedures for such a project.

Wastewater

As noted previously, the Draft EIR identifies the development of an agreement to discharge wastewater to the Wakefield municipal sewer system but it does not include any details regarding how I/I will be removed, the amount of I/I to be removed or identify how downstream flows will be redirected to mitigate downstream impacts. The Final EIR should provide more specificity regarding wastewater mitigation. The Final EIR should include copies of the agreements between the proponent and the Town of Wakefield and between the proponent and the MWRA. The Draft EIR should include revised Section 61 Findings for the MassDEP Sewer Connection Permit that include a commitment to remove I/I on a 4:1 basis (i.e. 305,400 gpd). In addition, it should discuss the applicability of MassDEP construction requirements for protection of water supply resources (Policy BRP/DWM/WS/P03-1).

Transportation

The Final EIR should include revised Section 61 Findings, in the form of a letter of commitment, for the MassHighway Access Permit. The Final EIR and/or the Section 61 Findings should address the comments identified in the MassHighway letter including: interconnection and coordination of traffic signals for the morning and evening peak hours,

development of interim mitigation in the event that MassHighway improvements included in the 2009 TIP are not underway or substantially complete prior to site occupancy and the feasibility of shuttle service to the ARC in Woburn. The ARC is located in close proximity to the site and would strengthen the TDM Program significantly by providing a connection to the array of transportation connections at ARC including commuter rail service, AMTRAK service and shuttle service to the Logan Airport and the Route 128 corridor. As the air quality analysis demonstrates, the proposed roadway improvements only reduce the increase in hydrocarbon emissions by 17% and, as noted in the section below, improvements and the TDM Program only reduce GHG emissions by 10%. Strengthening of the TDM Program through establishment of shuttle service to the ARC could provide additional measurable reductions in air pollution and GHG emissions. Comments from MassDEP, Saugus River Watershed Council and Walk Boston support also identify shuttle service as an effective approach to reducing vehicle emissions. I strongly encourage the proponent to analyze the feasibility of this service and, if feasible, commit to its implementation. In addition, the Final EIR should clarify whether the shuttle service for seniors will include a stop at the retail/commercial area of the site.

With the exception of improved pedestrian connections, the Draft EIR does not propose any changes to the retail and office portion of the site. The project continues to include large parking areas and a ring road around the perimeter of the retail/commercial area of the site that separates it from the residential area. The Draft EIR identifies parking ratios for each element of the project and compares it to parking ratios of similar mixed-use projects. The project will include construction of 2,718 new parking spaces (of which 2,242 will be surface parking spaces and 458 will be located underneath buildings). The Draft EIR indicates that the average parking ratio will be 4.7 to 1,000 sf of development. It indicates that shared parking is incorporated into the project but does not demonstrate the reduction in parking associated with the use of shared parking. It indicates that some retailers, including the Whole Foods store, have requested a significantly higher parking ratio (i.e. 6.5:1,000 to 7.0:1,000). This parking ratio appears high for a mixed-use development with a significant amount of housing in close proximity, although the Draft EIR indicates that this is driven by the relatively large amount of restaurant uses proposed on the site and is consistent with other mixed use developments that include parking ratios of 4.2, 4.3 and 4.7 per 1,000 sf.

I remain concerned that the inclusion of the ring road, the amount of parking and the lack of a direct pedestrian/bicycle connection to the Walnut Street neighborhood compromises the proponent's intent to create a true mixed use development that effectively minimizes vehicle trips and promoted walking and biking on the site. The Draft EIR indicates that the proponent did consult with Walk Boston regarding its comments on the EENF and identifies improvements to pedestrian and bicycle access including the multi-use trail, expansion of the width of sidewalks to a minimum of 6 feet (and up to 18 feet along Main Street) and the addition of connections between existing uses and new development. Nevertheless, the comment letter from Walk Boston identifies several opportunities for improving non-vehicular access to and through the site. I encourage the proponent to carefully consider the suggestions included in the Walk Boston comment letter including incorporation of sidewalks within the parking lot.

Greenhouse Gas Analysis

The GHG analysis calculates total CO_2 emissions by adding transportation emissions with direct and indirect stationary emissions (from on-site sources and energy use). The GHG Emissions analysis evaluated the change in CO_2 emissions for the 2007 Existing, 2012 No-Build, the 2012 Build and the 2012 Build with Improvements Conditions. Stationary source emissions were developed using the EQUEST model. Transportation emissions were developed using procedures similar to the ozone mesoscale analysis and emissions reductions associated with the TDM Program were calculated using the EPA COMMUTER model.

The Table below indicates that, under the Build Condition, CO_2 emissions are expected to increase by 10,399 tons per year (tpy) from the No-Build Condition. The incorporation of proposed mitigation measures, identified on page 10-10 in the Draft EIR, is estimated to reduce CO_2 emissions by 1,309 tons per year (tpy), which represents a 12.6 % reduction.

GHG Analysis	2007 Existing Conditions	2012 No-Build Condition	2012 Build Condition	2012 Project CO_2 Emissions	2012 Build w/ Improvements Condition	2012 CO2 Reductions	Percent Reduction in GHG Emissions
Mobile Sources	160,802.1	173,662.8	179,578.7	5,915.9	178,993.1	**-585.6**	**10.1%**
Stationary Sources	2,327.4	2,327.4	6,810.5	4,483.1	6,086.9	**-723.6**	**16.1%**
Total	163,129.5	175,990.2	186,389.2	10,399.	185,080.0	**-1,309.2**	**12.6 %**

* all units expressed in tons per year (tpy)

The proposed improvements include architectural design treatments, building systems, siting and site design and transportation measures. The Section on page 10-10 is titled Proposed Improvements; however, the language indicates that these are "mitigation measures that were considered for implementation and are reflected in the GHG analysis." These mitigation measures have been listed in the mitigation section at the end of this Certificate. If the proponent is not committed to these measures, this should be clarified in the Final EIR. The Draft EIR indicates that the proponent is working with one of its tenants, Whole Foods Market, to identify green building components consistent with the Whole Foods Green Initiative for energy and GHG reductions. As part of this effort, Whole Foods is considering use of solar panels on its roof. I encourage the proponent and Whole Foods to explore the Commonwealth Solar initiative which could increase the financial feasibility of such an effort. This initiative provides rebates for the installation of photovoltaic (PV) projects at commercial, residential, industrial, and public facilities. Non-residential projects are eligible for rebates for PV projects up to 500 kilowatts (kW) and residential projects are eligible for up to 5 kW.

In addition, I continue to encourage the proponent to consider constructing buildings that are consistent with the Leadership in Energy and Environmental Design (LEED) standard for new buildings (and Massachusetts LEED Plus for its office buildings) and/or offsetting GHG

emissions through the purchase of carbon credits or renewable energy. According to nationally recognized energy efficiency programs, such as the USEPA energy star-rating program, commercial buildings, including office buildings, can be designed to use 40 percent less energy and about 35 percent less CO_2 than the average building.

As noted previously, transportation related mitigation includes roadway improvements and development of a TDM Program. Analysis of shuttle service to the ARC may demonstrate significant air quality and GHG emissions reductions.

MassDEP comments indicate that it has reviewed the GHG analysis for consistency with the GHG policy and to assess the measures that will be taken to reduce CO_2 emissions. These comments provide an evaluation of the analysis and its consistency with the GHG Policy that may be useful to the proponent and/or consultant if they submit projects to MEPA in the future that are subject to the GHG Policy. For instance, the proponent should pay particular attention to alternatives selected, modeling inputs (i.e. project size and configuration, type of heating, ventilation and cooling systems, amount of glazing, potential usage and hours of operation), labeling of data and charts and the justification of selected mitigation.

The proponent is not required to provide additional information on GHG emissions; however, to the extent that additional measures are proposed, I encourage the proponent to identify these in the Final EIR.

Mitigation

The Final EIR should include an updated and revised section on mitigation measures. The Draft Section 61 Findings for state permits should be updated and revised and a Section 61 Finding for the 401 Water Quality Certificate should be provided. The Draft EIR indicates that the proponent is committed to the following measures to avoid, minimize and mitigate project impacts:

- restoration and re-vegetation of a 25-foot buffer around Reedy Meadow(with the exception of the widened roadway);
- maintenance of a 150-foot buffer on the east side of the Saugus River and provision of public access, benches and interpretive information adjacent to the canal;
- placement of a CR on 114 acres of the site, including the newly established buffer zones;
- $25,000 to fund a feasibility study to address the practicality of raising the summer water levels in Reedy Meadow for the benefit of state-listed marsh birds;
- construction of a multi-use path on the project site within the buffer to Reedy Meadow;
- design and construction of a SMP consistent with MassDEP stormwater standards;
- use of 2.3 acres of pervious pavement within the residential area of the site;
- avoidance of in-water silt producing work from February 15 through June 30;
- perchlorate-containing blasting agents will not be used during construction;
- funding of a study of I/I sources on the project site;

- funding to identify and remove I/I in Wakefield (on-site and off-site);
- redirection of sewer flows in Melrose to relieve surcharge and overflow conditions;
- incorporation of measures to reduce GHG emissions including use of highly-reflective roofing materials for 75% of flat roofs in the commercial and office buildings, maximize interior daylighting through floor plates, increased perimeter and use of skylights and light wells in commercial and office areas, window glazing to balance and optimize daylighting, heat loss and solar heat gain performance in all project buildings, use of high-efficiency HVAC systems in commercial and office areas, elimination of refrigerants in HVAC systems, incorporation of motion sensors, lighting and climate control in all public areas, use of efficient, directed exterior lighting for all buildings, provide construction and design guidelines to support sustainable design for tenant build-out, conservation and resource protection measures identified above and transportation-related measures identified below;
- geometric improvements, traffic signal installation and/or traffic signal coordination are proposed at the Audubon Road/Colonial Golf Club Driveway intersection, the Audubon Road/I-95 southbound ramps intersection, the Walnut Street/Salem Street/I-95 northbound ramps intersection, and the Walnut Street/I-95 southbound ramps/Colonial Golf Club Driveway intersection; and
- implementation of a TDM program including: an on-site Transportation coordinator, bicycle and pedestrian accommodations, a shuttle service for senior citizens, the provision of ZIP Car service and employer-based TDM measures.

In addition, the NHESP letter included in the Draft EIR identifies specific commitments the proponent has made to avoid a "take". These include:

- provide a draft recordable CR, showing the boundaries of the CR area, the boundary of the golf course play area within the CR area and a monumentation and signage scheme that will be approved by NHESP prior to the start of work;
- provide a revised planting plan that will be approved by NHESP prior to construction;
- incorporate information regarding the CR area and the Reedy Meadow area into the Operation and Maintenance Plans (O&M) for the golf course and development including the requirements to notify grounds crews of the presence of these restricted areas, to inspect the boundaries at least twice annually and to maintain signage and bounds;
- provide draft O&M plans to NHESP for review and approval prior to January 1, 2009; and
- development of a NHESP-approved escrow agreement for the $25,000 feasibility funds.

Circulation

The Final EIR should be circulated in compliance with Section 11.16 of the MEPA regulations. Copies should be sent to any state agencies from which the proponent will seek permits or approvals, to the list of "comments received" below, to Lynnfield and Wakefield officials and to the Lynnfield and Wakefield public library.

April 11, 2008
Date

Ian A. Bowles

Comments Received:

4/1/08	Department of Environmental Protection/Northeast Regional Office (MassDEP/NERO)
3/31/08	Division of Marine Fisheries (DMF)
4/7/08	Division of Marine Fisheries (DMF) (second letter)
3/18/08	Division of Fisheries and Wildlife/Natural Heritage and Endangered Species Program (DFW/NHESP)
3/31/08	Massachusetts Water Resources Authority (MWRA)
4/1/08	Executive Office of Transportation (EOT)
4/1/08	Town of Lynnfield/Board of Selectmen
3/28/08	Town of Wakefield/Board of Selectmen
3/18/08	Lynnfield Initiatives for Elders, Inc. (LIFE)
4/1/08	MassAudubon
4/1/08	Saugus River Watershed Council
3/21/08	Walk Boston

IAB/CDB/cdb

DEIR

7

Air Quality

Introduction

PHF-ND Colonial LLC (the "Proponent") is proposing to develop Meadow Walk at Lynnfield (the "Project"), a mixed-use retail, office and residential village. The Project will be built on a portion of the Sheraton Colonial Golf Course located off of Walnut Street in Lynnfield and Audubon Road in Wakefield, Massachusetts (the "project site"). The Project consists of 395,000 SF of retail space, 80,000 SF of office space, and 220 rental housing units, of which 40 housing units will be allocated to Lynnfield Initiative For Elders (LIFE), a Lynnfield based non-profit entity.

This chapter presents a summary of the air quality study conducted for the Project including an ozone mesocale analysis, as well as mitigation measures in order to improve air quality in the area. This chapter also provides a preliminary analysis of greenhouse gas emissions.

Background

The Massachusetts Department of Environmental Protection (DEP) has established guidelines that define the modeling and review criteria for air quality studies prepared pursuant to review under the Massachusetts Environmental Policy Act (MEPA). These guidelines require that mesoscale analyses be prepared for proposed development projects to determine the change in project-related ozone precursor emissions. The predominant source of ozone precursor emissions anticipated from the Project is emissions from Project-related traffic. Ozone is not directly emitted by motor vehicles, but is generated when volatile organic compounds (VOC) and oxides of nitrogen (NOx) emissions from motor vehicles, stationary sources, and area sources react in the atmosphere with sunlight and heat. Project-related ozone impacts are determined by assessing the changes in VOC and NOx emissions of motor vehicles. The DEP criteria require that proposed development projects include all reasonable and feasible emission reduction mitigation measures if the emissions from the Build Condition are greater than the No-Build Condition. Massachusetts has incorporated this criterion into the State Implementation Plan (SIP).

In July 2007, MEPA issued a draft policy and protocol for evaluating greenhouse gas emissions from proposed projects with particular emphasis on carbon dioxide (CO2)

Greenhouse Gas Emissions Analysis

On July 11, 2007, the Executive Office of Energy and Environmental Affairs (EEA) issued for public comment a draft policy that requires project proponents to implement feasible measures to minimize GHG emissions. This policy requires that projects undergoing review by the MEPA Office at the EIR level and meeting specific criteria (e.g., generation of 3,000 or more vehicle trips per day) quantify the project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying project-related GHG emissions, the policy also requires proponents to quantify the impact of proposed mitigation in terms of emissions and energy savings. The goal of this policy is to identify measures to reduce or minimize the GHG emissions.

The purpose of this section is to calculate the GHG emissions from mobile sources and both direct and indirect stationary sources related to the Project. While GHG emissions include several gases, Carbon Dioxide (CO2) was selected for evaluation because it is the most significant component of project-related GHG emissions.

The air quality study calculated GHG emissions from mobile and stationary sources. The mobile source emissions were calculated by performing a yearly GHG emissions analysis to evaluate the changes in CO2 emissions for the existing and future conditions within the study area. Similar to the mesoscale analysis for ozone, the year 2012 was selected as the future year of analysis because MEPA's policy requires that a project look five years into the future from the current year of analysis. The GHG emissions mobile source analysis traffic (volumes, delays, and speeds) and emission factor data were developed for four conditions, 2007 Existing, the 2012 No-Build, the 2012 Build, the 2012 Build with Improvements. In addition to mobile sources, direct and indirect CO2 emissions from the Project's proposed building sources were calculated using the computer-based EQUEST model.[3] Direct emissions included those emissions from the facility itself such as boilers, heaters, and internal combustion engines. Indirect emissions included CO2 emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Total CO2 emissions were determined by combining the CO2 results from the mobile source analysis with the CO2 emissions from the proposed direct and indirect building sources.

Mobile Source Analysis

The GHG mobile source analysis was conducted following procedures similar to the ozone mesoscale analysis. The mobile source analysis estimated the area wide CO2

[3] EQUEST (the Quick Energy Simulation Tool), version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA

emissions from vehicle traffic for a time period of one year. The change in CO2 emissions from traffic were based on the average yearly traffic volumes, roadway lengths and vehicle emissions factors for existing and new trips for weekday and weekend conditions.

Mobile Source Emission Rates

Currently MOBILE6.2 has a simple estimate of CO2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts-specific conditions. A detailed presentation of the MOBILE6.2 input and output data are presented in Attachment K, *Air Quality*.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mesoscale analysis for CO2 emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The traffic data used in the air quality study are presented in Attachment K, *Air Quality*. The detailed traffic analysis is presented in Chapter 6 *Transportation*.

■

Stationary Source Analysis

The Project will generate GHG emissions through the use of electricity and fossil fuels. The stationary source analysis calculated Project-related CO2 emissions from these building sources using the computer-based EQUEST model. These building sources included boilers, heaters and internal combustion engines. While the Project is in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. The stationary source analysis calculated GHG emissions for two conditions: the 2012 Build and the 2012 Build with Improvements. The 2012 Build Condition represents the stationary source emissions that would occur if the Project were to be built using typical construction materials and rooftop equipment. The 2012 Build with Improvements Condition represents the Project emissions based upon the use of improved building materials and rooftop equipment.

Existing Conditions

EPA has not set NAAQS for greenhouse gases, however, they do encourage strategies to reduce emissions and save fuel. EEA and MEPA's draft GHG emissions policy calls for proposed projects to reduce, minimize, or mitigate these emissions. The calculation of 2007 Existing Condition emissions provides a base for which future years can be evaluated.

Mobile Source Emissions

The mobile source analysis calculated the 2007 CO2 emissions from the major roadways in the study area. These emissions, estimated to be 160,373.0 tons/year, establish a baseline to which future emissions can be compared. Table 7-3 presents the existing CO2 analysis results for existing conditions.

Stationary Source Analysis

The Project will not exist under existing conditions and therefore no direct and indirect CO2 emissions from stationary sources would be generated.

Project Impacts

Future project-related emission calculations are based upon changes in traffic and emission factor data as well as the Project's building sources. The traffic data include traffic volumes, vehicle-miles-of-travel, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The Project's building sources included direct emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following section reports the findings of the mobile source and stationary source analyses for the Project.

Mobile Source Emissions

The mobile source analysis estimated the future study area CO2 emissions due to the changes in traffic and emission data. Under the 2012 No-Build Condition CO2 emissions were estimated to be 173,141.7 tons per year.

Under the 2012 Build Condition, the CO2 emissions were estimated to be 178,731.6 tons per year. Under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 178,571.9 tons per year. This results in a decrease of 159.7 tons per year in CO2 emissions as compared to the 2012 No-Build Condition.

This reduction is due to the geometric and operational improvements of the study area roadways. Table 7-3 presents the mobile source analysis results for all conditions.

Stationary Source Analysis

The stationary source analysis calculated 2012 Build and 2012 Build with Improvements CO2 emissions for direct and indirect emissions from stationary sources. Direct emissions included those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions included those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Under the 2012 Build Condition, the CO2 emissions were estimated to be 5,312.9 tons per year. Under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 4,733.5 tons per year. This results in a decrease of 579.3 tons per year in CO2 emissions as compared to the 2012 No-Build Condition. This reduction is due to the building mitigation measures discussed below.

Table 7-3 presents CO2 emissions from mobile and direct and indirect stationary sources under all conditions.

Table 7-3
CO2 Analysis Results with Mitigation Condition*

GHG Analysis	2007 Existing Condition	2012 No-Build Condition	2012 Build Condition	2012 Build w/ Improvements Condition	2012 Build with Improvements/Build Difference
Mobile Source Analysis	160,373.0	173,141.7	178,731.6	178,571.9	-159.7
Direct /Indirect Stationary Source	NA	NA	5,312.9	4,733.5	-579.3
Total	NA	NA	184,044.5	183,305.4	-739.0

*Tons per Year

Improvements

The EEA and MEPA draft GHG emissions policy encourages project proponents to identify and quantify measures that would reduce or minimize GHG emissions from mobile sources and direct and indirect stationary sources. The Proponent has developed physical and operational mitigation measures to be included in the Project. The following is a partial list of these mitigation measures. They include:

Mobile Sources

- All transportation-related mitigation measures stated in the Ozone mesoscale analysis TDM Measures section

Stationary Sources

- Use high-albedo roofing materials
- Eliminate or reduce use of refrigerants in HVAC systems
- Maximize interior daylighting through floor plates, increased building perimeter and use of skylights and light wells
- Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance
- Incorporate motion sensors and lighting and climate control
- Use efficient, directed exterior lighting

Conclusion

The air quality study demonstrates that the Project complies with the Clean Air Act Amendments (CAAA), the State Implementation Plan (SIP), and the Executive Office of Energy and Environmental Affairs (EEA) policy on Greenhouse Gas emissions. The ozone mesoscale analysis demonstrates that the Project will result in an increase of VOC and NOx emissions, as compared to the No-Build Condition.

Consistent with the guidelines of the Massachusetts Department of Environmental Protection (DEP), the Project will incorporate reasonable and feasible mitigation measures to reduce VOC and NOx emissions. These mitigation measures include roadway improvements, traffic signal improvements and a TDM program. The implementation of these mitigation measures will help reduce the VOC and NOx emissions associated with the Project. The GHG emissions analysis demonstrates that the Project meets the EEA draft policy on GHG emissions because it includes mobile and stationary source mitigation measures that will reduced the GHG emissions.

The air quality study demonstrates that the Project conforms to the CAAA, the SIP, and EEA GHG policy because:

- It will implement reasonable and feasible emission reduction mitigation measures;
- No new violation of the NAAQS will be created;
- No increase in the frequency or severity of any existing violations will occur; and
- No delay in attainment of any NAAQS will result.

10

Greenhouse Gases

Introduction

This chapter discusses the calculation of the Greenhouse Gas (GHG) emissions from mobile sources and both direct and indirect stationary sources related to the Project. While GHG emissions include several gases, Carbon Dioxide (CO2) was selected for evaluation because it is the most significant component of project-related GHG emissions.

The GHG emissions analysis demonstrates that the Project is in compliance with the EEA policy on GHG emissions. The Project will include mobile and stationary source mitigation measures that will result in reduced GHG emissions for the build condition with improvements related to energy efficiency and other sustainable design and operation measures.

Background

The Executive Office of Energy and Environmental Affairs (EEA) recently developed and issued a policy that requires project proponents to implement feasible measures to minimize GHG emissions. This policy requires that projects undergoing review by the MEPA Office at the EIR level and meeting specific criteria (e.g., generation of 3,000 or more vehicle trips per day) quantify the project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying project-related GHG emissions, the policy also requires proponents to quantify the impact of proposed mitigation in terms of emissions and energy savings. The goal of this policy is to identify measures to reduce or minimize GHG emissions.

Summary of Findings

The GHG emissions analysis evaluated the change in CO2 emissions from Project-related traffic and proposed building sources for the 2007 Existing, the

2012 No-Build, the 2012 Build, and the 2012 Build with Improvement Conditions. Under the Build Condition, the CO2 emissions were estimated to increase by 10,399 tons/year from the No-Build Condition. However, with the recommended physical and operational mitigation measures, TDM program, and improvement measures associated with the proposed building systems, the CO2 emissions are estimated to be reduced by 1,309 tons/year from the 2012 Build Condition. The greenhouse gas emissions analysis demonstrates that the Project meets the Executive Office of Energy and Environmental Affairs (EEA) draft policy on GHG emissions. The Project will include mobile and stationary source mitigation measures that will result in reduced GHG emissions for the 2012 Build with Mitigation condition.

Coordination with the Executive Office of Energy and Environmental Affairs

As requested in the Secretary's Certificate, on December 18, 2007, the Proponent's team met with representatives from the EEA to discuss the Project's greenhouse gas emissions analysis. The EEA encouraged the Proponent to consider mitigation measures listed in the Appendix of the Greenhouse Gas Policy. As described in this chapter, the Proponent consulted with the Project's design and engineering team and identified which mitigation measures from the Greenhouse Gas Policy are feasible to include in the Project. The EEA encouraged the Proponent to consider additional measures such as heating and cooling load management by design, combined heat and power, and photovoltaics for the Project. The Proponent considered several of those additional measures and will continue to explore how to further reduce energy demand as future tenants are identified. For example, the Proponent is working with one of their tenants, Whole Foods Market, to identify various green building components consistent with their Whole Foods Green Initiative for energy and greenhouse gas reduction. The Proponent has also committed to review additional TDM measures. As a result, a senior shuttle to and from the Lynnfield Senior Center will serve the LIFE development, and the Project will include accommodations for Zipcar.

Existing Conditions

The EEA and MEPA's GHG emissions policy calls for proposed projects to reduce, minimize, or mitigate these emissions. The calculation of 2007 existing condition emissions of mobile and stationary sources provides a base for which future years are evaluated.

Mobile Source Emissions

The mobile source analysis calculated the 2007 CO2 emissions from the major roadways in the study area. These emissions, estimated to be 160,802 tons/year, establish a baseline to which future emissions can be compared. Table 10-1 presents the existing CO2 analysis results for existing conditions.

Stationary Source Analysis

The GHG analysis calculated the 2007 CO2 emissions for direct and indirect emissions from the existing stationary sources. Direct emissions included those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions included those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems.

Under the 2007 Existing Condition, the CO2 emissions were estimated to be 2,327 tons per year, establishing a baseline to which future emission can be compared. Table 10-1 presents the existing CO2 analysis results for existing conditions.

Greenhouse Gases Emissions Analysis

The air quality study calculated GHG emissions from mobile and stationary sources. The mobile source emissions were calculated by performing a yearly GHG emissions analysis to evaluate the changes in CO2 emissions for the existing and future conditions within the study area. Similar to the mesoscale analysis for ozone, the year 2012 was selected as the future year of analysis because MEPA's policy requires that a project look five years into the future from the current year of analysis. The GHG emissions mobile source analysis traffic (volumes, delays, and speeds) and emission factor data were developed for four conditions: 2007 Existing, the 2012 No-Build, the 2012 Build and the 2012 Build with Improvements. In addition to mobile sources, direct and indirect CO2 emissions from the Project's proposed building sources were calculated using the computer-based EQUEST model.[1] Direct emissions included those emissions from the facility itself such as boilers, heaters, and internal combustion engines. Indirect emissions included CO2 emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Total CO2 emissions were determined by combining the CO2 results from the mobile source analysis with the CO2 emissions from the proposed direct and indirect building sources.

[1] EQUEST (the Quick Energy Simulation Tool), version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA

Mobile Source Analysis

The GHG mobile source analysis was conducted following procedures similar to the ozone mesoscale analysis. The mobile source analysis estimated the area wide CO2 emissions from vehicle traffic for a time period of one year. The change in CO2 emissions from traffic were based on the average yearly traffic volumes, roadway lengths and vehicle emissions factors for existing trips, new trips, and new trips with roadway improvements for weekday and weekend conditions. The air quality benefits from the TDM program were calculated using the EPA's computer-based COMMUTER model.

Mobile Source Emission Rates

Currently MOBILE6.2 has a simple estimate of CO2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts-specific conditions. A detailed presentation of the MOBILE6.2 input and output data are presented in Attachment H.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mesoscale analysis for CO2 emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The traffic data used in the air quality study are presented in Attachment H. The detailed traffic analysis is presented in Chapter 8 *Transportation*.

Stationary Source Analysis

The Project will generate GHG emissions through the use of electricity and fossil fuels. The stationary source analysis calculated Project-related CO2 emissions from these building sources using the computer-based EQUEST model. These building sources included boilers, heaters and internal combustion engines. While the Project is in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. The stationary source analysis calculated GHG emissions for two conditions: the 2012 Build and the 2012 Build with Improvements. The 2012 Build Condition represents the stationary source emissions that would occur if the Project were to be built using typical construction materials and rooftop equipment. The 2012 Build

with Improvements Condition represents the Project emissions based upon the use of improved building materials and rooftop equipment.

Project Related CO2 Emissions

Future project-related emission calculations are based upon changes in traffic and emission factor data as well as the Project's building sources. The traffic data include traffic volumes, vehicle-miles-of-travel, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The Project's building sources included direct emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following section reports the findings of the mobile source and stationary source analyses for the Project.

Mobile Source Emissions

The mobile source analysis estimated the future study area CO2 emissions due to the changes in traffic and emission data. Under the 2012 No-Build Condition CO2 emissions were estimated to be 173,663 tons per year.

Under the 2012 Build Condition, the CO2 emissions were estimated to be 179,578 tons per year. Under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 178,993 tons per year. This results in a decrease of 586 tons per year in CO2 emissions as compared to the 2012 Build Condition. This represents a reduction by nearly 10 percent of the Project-related CO2 emissions. This reduction is due to the geometric and operational improvements of the study area roadways and the TDM program. Table 10-1 presents the mobile source analysis results for all conditions.

It should be noted that the mobile source emissions are conservative because the traffic data were based upon ITE trip generation rates which are considered to be higher than the actual trip generation rates expected in the future build years. For example, empirical data from two similar retail facilities in Massachusetts were found to be about half (52 percent) of the vehicle trips that were calculated using ITE trip generation rates for the same land use (retail). While this chapter does not quantify the greenhouse gas emission reductions from the empirical data, it demonstrates that the emissions from the trips associated to the Project are expected to be smaller and result in additional improvements to air quality in the study area.

Stationary Source Analysis

The stationary source analysis calculated 2012 No build, 2012 Build and 2012 Build with Improvements CO2 emissions for direct and indirect emissions from stationary sources. Direct emissions included those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions included those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Under the 2012 No Build Condition, no changes to the stationary sources were assumed from the existing conditions; hence, the same CO2 emissions as in the 2007 Existing Condition were assumed, which were estimated to be 2,327 tons per year. Under the 2012 Build Condition, the CO2 emissions were estimated to be 6,811 tons per year. Under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 6,087 tons per year. This results in a decrease of 724 tons per year in CO2 emissions, which is approximately a 16 percent reduction as compared to the 2012 Project CO2 emissions. This reduction is due to the building mitigation measures discussed below.

Table 10-1 presents CO2 emissions from mobile and direct and indirect stationary sources under all conditions.

Table 10-1
CO2 Analysis Results with Mitigation Condition*

GHG Analysis	2007 Existing Condition	2012 No-Build Condition	2012 Build Condition	2012 Project CO2 Emissions**	2012 Build w/ Improvements Condition	2012 CO2 Reductions due to Project Improvements***
Mobile Source Analysis	160,802.1	173,662.8	179,578.7	5,915.9	178,993.1	-585.6
Direct /Indirect Stationary Source	2,327.4	2,327.4	6,810.5	4,483.1	6,086.9	-723.6
Total	163,129.5	175,990.2	186,389.2	10,399.0	185,080.0	-1,309.2

*Tons per Year
** Build/No-Build Difference
***Build with Improvements/Build Difference

Mitigation

As part of MEPA's GHG Policy, a menu of mitigation measures is provided for consideration by project proponents. A number of these measures are being considered and evaluated as part of the Project. Table 10-2 below summarizes a list of mitigation measures as they relate to greenhouse gas emissions and describes generally the benefits and limitations of these measures. The following section

"Proposed Project Improvements" presents the mitigation measures that have been adopted in whole or in part.

Table 10-2
Summary of Greenhouse Gas Emissions Mitigation Measures

	Mitigation Measure	Benefits	Limitations
1 Site Design & Layout			
1.a	Develop consistent with smart growth principles, including integrating transportation and land use.	Reduce s transportation air quality impacts. Preserves open space. Walkability provides improved health.	Public transportation may be non-existent or have limited funds. Must be coupled with making public transit appealing/convenient.
1.b	Minimize energy use through building orientation	A building's orientation with relation to the sun will impact heating and cooling, natural ventilation, and daylighting.	Site constraints, including environmental constraints or natural resources.
1.c	Preserve open space and conserve/restore natural resources on-site	Reduces land and air quality impacts (indirect) from development activities. Preserves larger ecosystems.	Site constraints may limit preservation of open space or the ability to restore natural resources.
1.d	Minimize building/development footprint	Reduces energy demand and other environmental impacts.	May not be preferred development program.
1.e	Utilize Low Impact Development (LID) measures for stormwater management	A potential measure to reduce land and air quality impacts from construction activities (indirect) with less land altering means of stormwater management through more natural systems.	Not all LID measures are appropriate for all development sites.
1.f	Design water efficient landscaping	Reduces or eliminates the use of potable water for irrigation and energy used for irrigation systems.	May not be preferred aesthetically.
2 Architectural Design/Treatments			
2.a	Use high- reflective (high-albedo) roofing materials	Reduces heat island effect and air quality impacts through reduced cooling requirements.	Buildings in very cold climates may not experience year-round energy benefits and may increase heating costs.
2.b	Maximize interior daylighting through floor plates, increased building perimeter and use of skylights and light wells	Reduces the need for electric lighting of building interiors, resulting in reduced energy use and air quality impacts. Can improve worker productivity and reduce absenteeism and illness.	Must carefully balance heat gain and loss, glare control, visual quality and variations of daylight availability. Sometimes requires modeling/ computer simulation.
2.c	Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance	Reduces energy demand through efficiency and, therefore, air quality impacts.	Costs
2.d	Incorporate super insulation to minimize heat loss	Reduces the loss of heat and cooling.	Long-term environmental waste implications.
2.e	Use recycled content/reused /regional building materials and products	Reduces natural resources and the energy associated with manufacturing new materials and shipping, indirectly reducing air quality.	Availability of products may be limited.

3	**Building Systems**		
3.a	Install high-efficiency HVAC systems	Limits the harmful environmental side effects of energy generation, distribution and consumption (i.e., pollution). Improve building comfort, while reducing operating costs.	Some energy-efficient measures may require additional first costs.
3.b	Eliminate use of chlorofluorocarbons (CFC)-based refrigerants in HVAC systems	Reduces damage to the protective ozone layer in the earth's upper atmosphere.	The use of CFC-based refrigerants have been phased out.
3.c	Do not use refrigerants or select refrigerants that do not emit pollutants contributing to ozone depletion and maintain those refrigerants	Minimizes the negative impacts of refrigerant use on ozone depletion and global warming.	May limit the types of HVAC systems available or require higher level of maintenance.
3.d	Reduce energy demand using peak shaving or load shifting strategies	Limits the harmful environmental side effects of energy generation, distribution and consumption (i.e., pollution). Improve building comfort, while reducing operating costs.	Some energy-efficient measures may require additional first costs.
3.e	Incorporate on-site renewable energy sources (e.g., solar, wind, geothermal)	Reduces dependence on fossil fuels and, therefore, reduces air quality impacts as a clean energy source. Provides for a more self-sufficient building with reduced energy costs.	May require upfront costs. Some technologies may not be cost effective.
3.f	Incorporate combined heat and power technologies	Reduces energy demand	Not efficient or effective in locations where the demand for hot water is low
3.g	Incorporate motion sensors and lighting and climate control	Reduces energy demand through efficiency and, therefore, air quality impacts.	Commonly employed in new office construction.
3.h	Incorporate water conserving fixtures	Saves energy to deliver and heat water.	Commonly employed in new construction.
3.i	Conduct building commissioning	Results in improved design and construction coordination.	Will result in increased soft costs and may require additional scheduling/coordination.
4	**Building Operations**		
4.1	Conduct ongoing measurement and verification of systems, or ongoing building commissioning	Results in optimal building operation and cost savings in terms of energy performance. Minimizes long-term air quality/environmental impacts.	Cost to institute an M&V Plan is strongly tied to complexity of building systems.
4.2	Provide storage and collection of recyclables	Diverts a significant portion of solid waste stream from landfills. Could result in reduced disposal costs and generate revenue.	Must encourage occupants to change behavior. Space constraints may limit storage and collection area.
4.3	Purchase appliances, computers with lowest energy rating (such as Energy Star-rated)	Reduces energy demand	Requires additional costs

5	*Alternative Transportation*		
5.1	Locate new buildings near public transportation and/or expand public transit onto or within walking distance	Reduces emissions and energy through the elimination of vehicle trips	Locations near public transportation help provide trip reductions are not always available or appropriate
5.2	Purchase alternative fuel and/or fuel efficient vehicles for fleet	The increased use of renewable and alternative fuels can result in significant reductions in air quality impacts from the use of petroleum-based fuels. By displacing petroleum fuels, many, although not all, of these fuels can provide reductions in greenhouse gas emissions.	To estimate the impacts of increases in renewable and alternative fuels on greenhouse gas emissions, the entire fuel lifecycle including fossil fuel extraction or feedstock growth, fuel production, distribution, and combustion should be accounted for.
5.3	Provide pedestrian and bicycle facilities on-site and connections off-site	Encourages alternative transportation and offsets air quality impacts from single-occupant vehicles.	Site constraints may limit the size/type of facilities.
5.4	Size parking capacity to meet, but not exceed, the local requirements and/or go for variance for reduced parking	Encourages employees to use alternative modes to travel to work	Alternative modes not always available or appropriate
5.5	Pursue opportunities for shared parking or banked parking	Encourages alternative transportation and offsets air quality impacts from single-occupant vehicles.	Requires coordination among different tenants
5.6	Parking management program, including preferential parking for carpool/vanpool or alternative fuel vehicles	Encourages alternative transportation and offsets air quality impacts from single-occupant vehicles.	May result in additional cost of staff to coordinate and manage
5.7	Implement Transportation Demand Management (TDM) measures to encourage alternative modes of transportation (e.g., posting of information, transit subsides, telecommuting/flex time)	Encourages alternative transportation and offsets air quality impacts from single-occupant vehicles.	May result in additional cost of staff to coordinate and manage
5.8	Roadway improvements to improve traffic flow	Reduces vehicle congestion and emissions	Requires additional costs
5.9	Provide no-idling truck zones at loading/off-loading	Meets State law requirements	Multiple signs may be needed to be visible
6	*Other*		
6.a	Develop design and construction sustainable guidelines	Allows tenant development to implement consistent building construction	Requires that project proponent maintain control of building construction
6.b	Use ultra-low sulfur diesel fuel for construction vehicles	Reduces temporary air quality impacts from construction vehicles.	May increase cost

Sources: MEPA Greenhouse Gas Emissions Policy and Protocol, Leadership in Energy and Environmental Design (LEED) New Construction Rating System, Ver. 2.2.

Proposed Project Improvements

The EEA and MEPA GHG emissions policy encourages project proponents to identify and quantify measures that would reduce or minimize GHG emissions from mobile sources and direct and indirect stationary sources. The Proponent has developed physical and operational mitigation measures to be included in the Project. The following is a list of the mitigation measures that were considered for implementation and are reflected in the GHG analysis. They include:

Architectural Design/Treatments

- Use highly-reflective (high-albedo) roofing materials for approximately 75 percent of the flat roofs in the commercial and office buildings.
- Maximize interior daylighting through floor plates, increased building perimeter and use of skylights and light wells in the commercial and office areas.
- Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance in all Project buildings.

Building Systems

- Install high-efficiency HVAC systems in commercial and office areas.
- Eliminate or reduce use of refrigerants in HVAC systems.
- Incorporate motion sensors and lighting and climate control in all public areas.
- Use efficient, directed exterior lighting for all Project buildings.
- Provide construction and design guidelines to facilitate sustainable design for build-out by tenants.

Siting and Site Design

- Provide permanent protection for open space on the Project site. The Project results in 114 acres of open space being placed under a conservation restriction.
- Conserve and restore natural areas on-site. As part of the preservation of 114 acres of open space on the project site, the Proponent will restore a significant buffer zone area along the boundary with Reedy Meadow.
- Minimize building footprint. A majority of site parking will be located under Project buildings.

Transportation Measures

- Install traffic signals at some of currently unsignalized intersections
- Widen roadways and reconfigure the lane usage
- Improve the traffic controls by keeping intersections coordinated and adjusting timing plans to maximize the efficiency of the traffic operations.
- Provide accommodations for Zipcar.

- Provide senior shuttle service.
- Provide improved access from the Project to transit stations.
- Provide flexible hours so that employees have the option of commuting outside the peak traffic periods. Similar benefits can also be realized through staggered work hours so that employee trips occur over a broader period and thereby reduce peak hour demands.
- Massachusetts' employees have the ability to use pre-tax dollars for the purchase of MBTA passes. The pre-tax purchase is free from both federal and state income and payroll taxes.
- Consider telecommuting options.
- Offer direct deposit to employees.
- Provide a guaranteed ride home program to eliminate an often-cited deterrent to carpool and vanpool participation.
- Sponsor vanpools and subsidize expenses.
- Provide preferential carpool and vanpool parking within the parking garages and spaces near office building entrances as a convenience to participants and to promote ridesharing.
- Provide subsidies to employees who purchase monthly or multiple trip transit passes.
- Hold promotional events for bikers and walkers.
- Provide incentives for bicycle and HOV commuting.
- Appoint an on-site TDM coordinator to help promote all above-mentioned measures.

Consistent with the Project's commitment to improve the environment, Whole Foods Market will be one of the major tenants in the retail component of the Project. Whole Foods Market is environmentally active and a leader in implementing "Green Actions" such as using environment-friendly, or LEED-certified, building materials in the new stores and using alternative energy sources (wind power, solar and biomass). Sustainable design measures will be incorporated into the Project to the maximum extent possible. Whole Foods Market's efforts will help further reduce greenhouse gas emissions in the study area.

Conclusion

The air quality study demonstrates that the Project complies with the Clean Air Act Amendments (CAAA), the State Implementation Plan (SIP), and the Executive Office of Energy and Environmental Affairs (EEA) policy on Greenhouse Gas emissions. The ozone mesoscale analysis demonstrates that the Project will result in an increase of VOC and NOx emissions, as compared to the No-Build Condition.

Consistent with the guidelines of the Massachusetts Department of Environmental Protection (DEP), the Project will incorporate reasonable and feasible mitigation measures to reduce VOC and NOx emissions. These mitigation measures include roadway improvements, traffic signal improvements and a TDM program. The

implementation of these mitigation measures will help reduce the VOC and NOx emissions associated with the Project. The GHG emissions analysis demonstrates that the Project meets the EEA policy on GHG emissions because it includes mobile and stationary source mitigation measures that will reduced the GHG emissions.

The air quality study demonstrates that the Project conforms to the CAAA, the SIP, and EEA GHG policy because:

- It will implement reasonable and feasible emission reduction mitigation measures;
- No new violation of the NAAQS will be created;
- No increase in the frequency or severity of any existing violations will occur; and
- No delay in attainment of any NAAQS will result.

DEAK

Meadow Walk in Lynnfield - Lynnfield, MA

Total CO2 Emission Results (Stationary and Mobile Sources)

Existing Conditions (2006)		Build Conditions (2012)	
CO2 from Building/Energy		CO2 from Building/Energy	
Boston Sports Club	477.2 tons	Office	523.5 tons
Conference Center	610.2 tons	Retail	3,757.7 tons
Sheraton Hotel	1,020.4 tons	Residential	1,031.7 tons
Club house building	195.4 tons	Boston Sport Club	477.2 tons
Maintenance Buildin	24.2 tons	Sheraton Hotel	1,020.4 tons
sum	**2,327.4 tons**	**sum**	**6,810.5 tons**

Net Increase from No Build to Build
CO2 from Stationary Source
4,483.1 tons

Net Increase from No Build to Build
CO2 from Mobile Source
5,915.9 tons

Total Yearly CO2 Emission Increase=
10,399.0 tons
10.4 Mega_tons

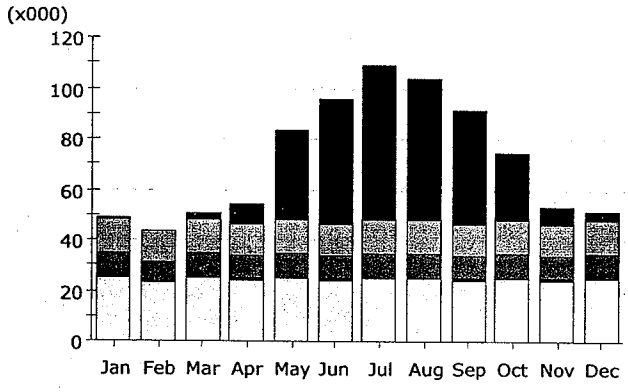
Improved Build Conditions (2012)	
CO2 from Building/Energy	
Office	464.9 tons
Retail	3,169.0 tons
Residential	955.3 tons
Boston Sport Club	477.2 tons
Sheraton Hotel	1,020.4 tons
sum	**6,086.9** tons

Net Increase from No Build to Build
CO2 from Stationary Source
3,759.4
which is approximately an 11% of reduction as compared to the 2012 Build Condition

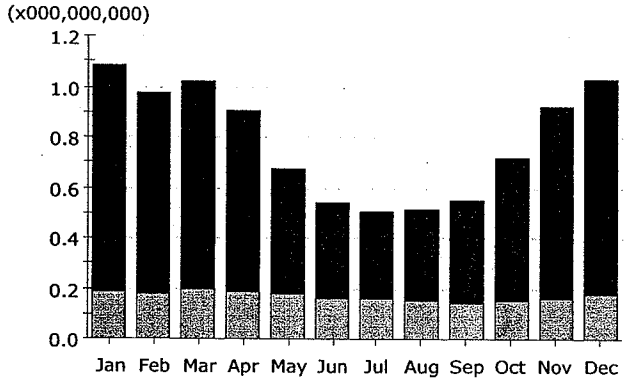
Net Increase from No Build to Improved Build
CO2 from Mobile Source
5,330.2 tons

Total Yearly CO2 Emission Increase=
9,089.6 tons
9.1 Mega_tons

Electric Consumption (kWh)



Gas Consumption (Btu)



Electric Consumption (kWh x000)

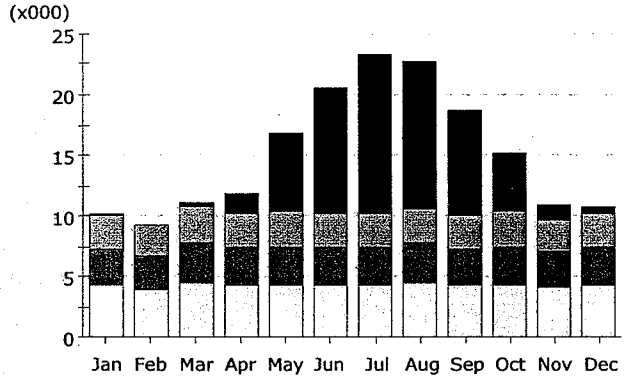
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.60	-	2.30	7.99	35.51	49.62	61.19	56.21	44.91	26.34	6.26	2.94	293.87
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	13.39	12.10	13.39	12.96	13.39	12.96	13.39	13.39	12.96	13.39	12.96	13.39	157.69
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.21
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	9.50	8.58	9.50	9.20	9.50	9.20	9.50	9.50	9.20	9.50	9.20	9.50	111.89
Task Lights	0.16	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	1.93
Area Lights	25.11	22.68	25.11	24.30	25.11	24.30	25.11	25.11	24.30	25.11	24.30	25.11	295.60
Total	48.80	43.54	50.50	54.63	83.68	96.23	109.36	104.37	91.52	74.52	52.91	51.14	861.19

Gas Consumption (Btu x000,000,000)

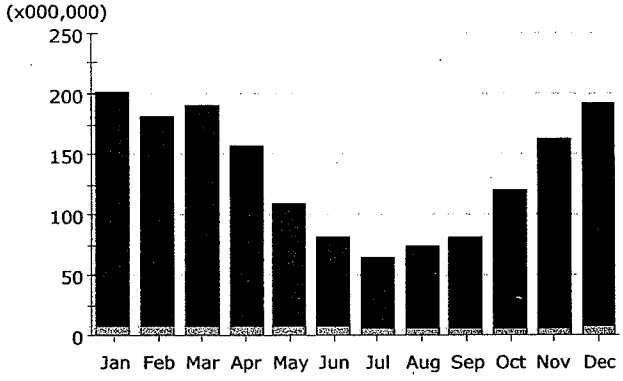
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.90	0.80	0.83	0.72	0.50	0.38	0.35	0.37	0.41	0.57	0.76	0.86	7.43
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.19	0.18	0.19	0.19	0.18	0.16	0.16	0.15	0.14	0.16	0.16	0.18	2.03
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.08	0.97	1.02	0.90	0.68	0.54	0.51	0.52	0.55	0.72	0.92	1.04	9.46

Project/Run: Lynnfield_club house - Baseline Design | Run Date/Time: 12/17/07 @ 10:50

Electric Consumption (kWh)



Gas Consumption (Btu)



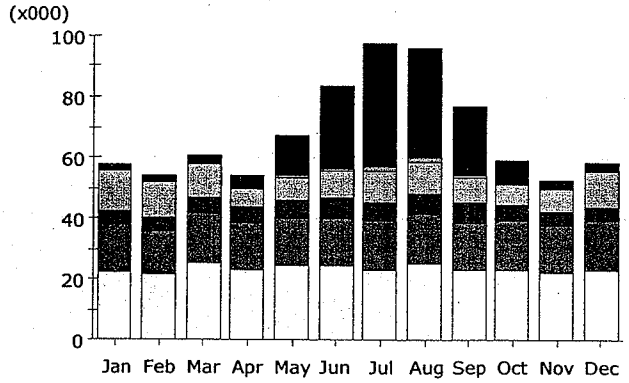
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.11	-	0.52	1.65	6.60	10.34	13.08	12.15	8.86	4.94	1.17	0.56	59.97
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.71	2.53	2.93	2.79	2.83	2.83	2.79	2.93	2.71	2.81	2.63	2.79	33.32
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.21
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	3.07	2.83	3.22	3.10	3.15	3.12	3.13	3.22	3.03	3.14	2.97	3.13	37.11
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	4.18	3.89	4.47	4.30	4.33	4.32	4.31	4.47	4.17	4.32	4.05	4.31	51.13
Total	10.11	9.29	11.18	11.87	16.92	20.61	23.31	22.77	18.79	15.23	10.85	10.82	181.75

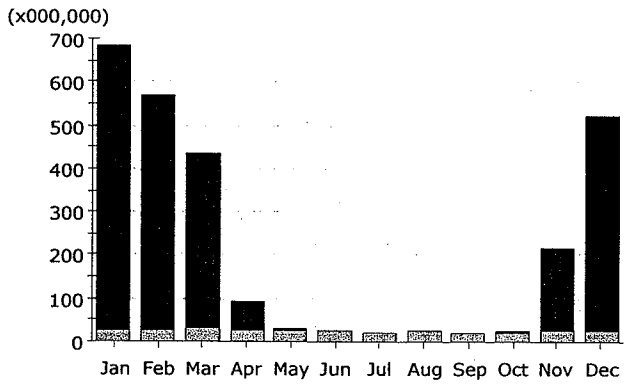
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	194.0	174.8	182.4	150.3	101.4	74.6	59.3	68.0	75.9	113.6	155.8	186.3	1,536.4
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	7.5	7.2	8.3	7.8	7.3	6.8	6.3	6.3	5.9	6.3	6.3	7.2	83.2
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	201.4	182.0	190.6	158.1	108.7	81.4	65.7	74.3	81.8	119.9	162.1	193.5	1,619.7

Electric Consumption (kWh)



Gas Consumption (Btu)



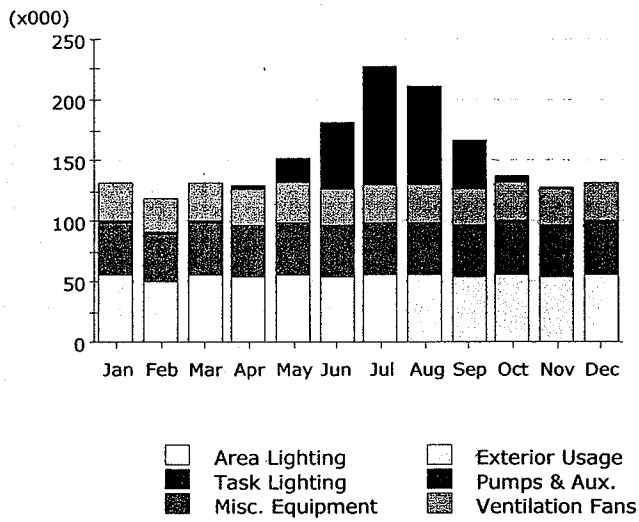
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	2.27	2.10	2.83	4.10	13.66	27.73	41.12	36.62	22.93	8.65	3.25	2.74	168.00
Heat Reject.	-	-	-	0.00	0.15	0.67	1.34	1.05	0.46	0.04	0.01	-	3.73
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	13.74	12.09	11.17	6.39	7.38	9.06	10.18	10.29	8.28	6.48	7.60	11.86	114.54
Pumps & Aux.	4.29	4.10	4.87	4.73	5.85	6.44	6.34	6.83	6.17	5.31	4.43	4.53	63.90
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	15.35	14.42	16.62	15.60	16.19	16.03	15.77	16.62	15.60	15.77	15.18	15.77	188.94
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	22.48	21.42	25.01	23.25	24.17	24.09	23.32	25.01	23.25	23.32	22.41	23.32	281.04
Total	58.13	54.13	60.50	54.08	67.41	84.02	98.08	96.42	76.69	59.57	52.88	58.22	820.15

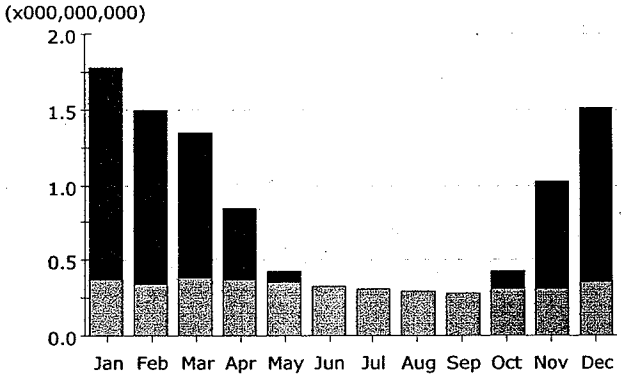
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	655.4	543.6	403.3	65.2	2.2	-	-	-	-	1.9	193.6	496.3	2,361.4
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	26.9	26.5	31.1	28.3	27.5	25.5	23.1	23.8	22.0	22.9	23.5	26.3	307.5
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	682.3	570.1	434.4	93.5	29.7	25.5	23.1	23.8	22.0	24.8	217.1	522.6	2,668.9

Electric Consumption (kWh)



Gas Consumption (Btu)



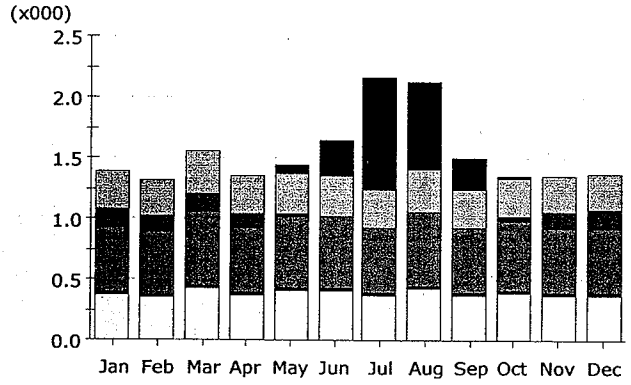
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.0	1.9	21.6	54.6	97.1	80.5	40.4	5.7	0.4	0.0	302.3
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	31.5	28.5	31.5	30.5	31.5	30.5	31.5	31.5	30.5	31.5	30.5	31.5	371.1
Pumps & Aux.	0.7	0.7	0.7	0.6	0.1	-	-	-	0.0	0.2	0.6	0.7	4.3
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	44.1	39.9	44.1	42.7	44.1	42.7	44.1	44.1	42.7	44.1	42.7	44.1	519.5
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	54.8	49.5	54.8	53.0	54.8	53.0	54.8	54.8	53.0	54.8	53.0	54.8	645.3
Total	131.2	118.5	131.2	128.7	152.2	180.8	227.6	210.9	166.6	136.4	127.3	131.1	1,842.5

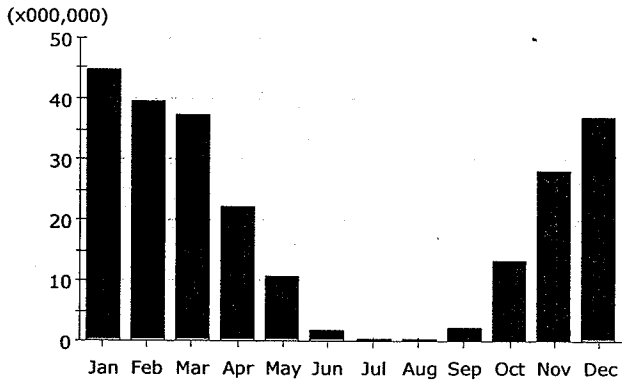
Gas Consumption (Btu x000,000,000)

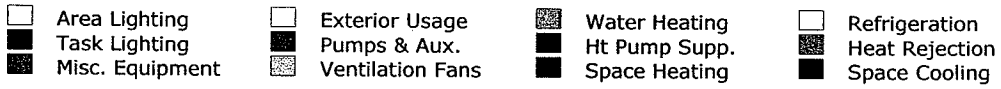
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.41	1.15	0.96	0.47	0.07	0.00	-	-	0.00	0.13	0.70	1.17	6.06
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.37	0.35	0.38	0.37	0.35	0.32	0.31	0.30	0.29	0.31	0.32	0.35	4.01
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.78	1.49	1.35	0.84	0.43	0.32	0.31	0.30	0.29	0.43	1.02	1.52	10.07

Electric Consumption (kWh)



Gas Consumption (Btu)





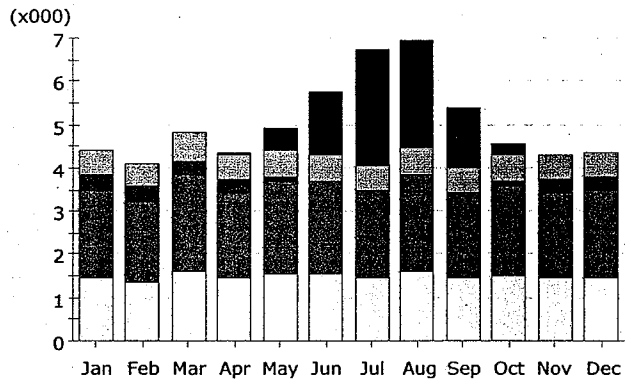
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	0.06	0.29	0.93	0.71	0.26	0.01	-	-	2.26
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.30	0.29	0.35	0.30	0.34	0.34	0.30	0.35	0.30	0.32	0.30	0.30	3.81
Pumps & Aux.	0.15	0.13	0.14	0.12	0.02	-	-	-	0.00	0.05	0.12	0.14	0.87
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.55	0.52	0.62	0.54	0.60	0.59	0.55	0.62	0.54	0.57	0.54	0.55	6.79
Task Lights	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.12
Area Lights	0.37	0.36	0.43	0.37	0.41	0.41	0.37	0.43	0.37	0.39	0.37	0.37	4.68
Total	1.38	1.31	1.55	1.35	1.44	1.64	2.17	2.12	1.49	1.35	1.35	1.37	18.54

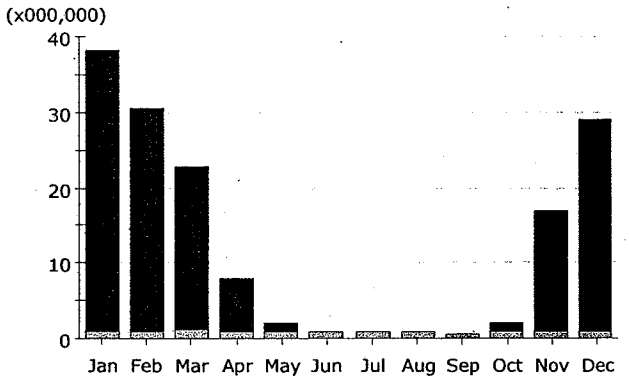
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	44.72	39.61	37.32	22.19	10.55	1.56	0.05	0.19	1.92	13.07	27.93	36.79	235.88
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.20	0.20	0.24	0.20	0.21	0.19	0.17	0.18	0.16	0.17	0.18	0.19	2.29
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	44.92	39.80	37.56	22.39	10.75	1.75	0.22	0.37	2.08	13.24	28.11	36.98	238.17

Electric Consumption (kWh)



Gas Consumption (Btu)



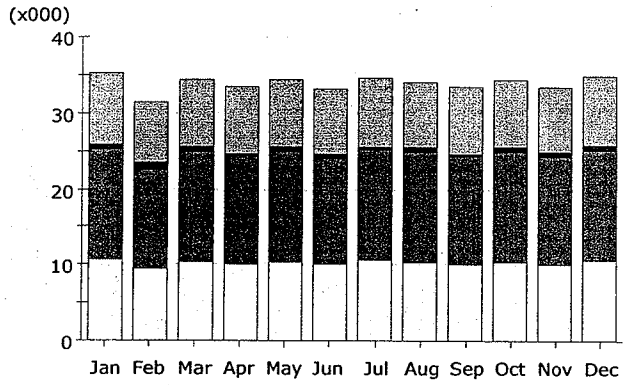
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.07	0.53	1.45	2.71	2.48	1.41	0.25	0.01	-	8.91
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.57	0.55	0.66	0.57	0.63	0.63	0.57	0.66	0.57	0.60	0.57	0.57	7.18
Pumps & Aux.	0.36	0.34	0.35	0.29	0.06	-	-	-	0.01	0.12	0.30	0.34	2.17
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.03	1.88	2.19	2.00	2.14	2.10	2.03	2.19	2.00	2.08	2.00	2.03	24.67
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	1.43	1.35	1.63	1.43	1.57	1.56	1.43	1.63	1.43	1.50	1.43	1.43	17.81
Total	4.40	4.12	4.83	4.36	4.93	5.75	6.75	6.96	5.41	4.55	4.31	4.38	60.74

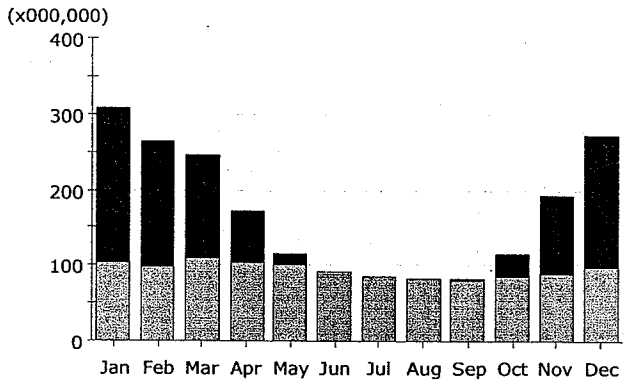
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	37.40	29.62	21.73	7.13	1.04	-	-	-	-	1.29	16.07	28.03	142.32
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.94	0.92	1.11	0.95	0.97	0.90	0.77	0.84	0.74	0.81	0.83	0.89	10.68
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	38.35	30.54	22.84	8.08	2.01	0.90	0.77	0.84	0.74	2.10	16.90	28.92	153.00

Electric Consumption (kWh)



Gas Consumption (Btu)



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	9.27	8.25	8.91	8.67	8.87	8.54	8.98	8.81	8.66	8.93	8.73	9.21	105.82
Pumps & Aux.	0.80	0.69	0.67	0.51	0.50	0.48	0.50	0.49	0.48	0.50	0.62	0.75	6.99
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	14.50	13.09	14.47	14.02	14.48	14.01	14.50	14.47	14.03	14.49	14.03	14.50	170.59
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	10.57	9.49	10.38	10.18	10.44	10.07	10.57	10.38	10.20	10.51	10.19	10.57	123.54
Total	35.14	31.51	34.43	33.38	34.29	33.10	34.55	34.16	33.37	34.43	33.57	35.03	406.94

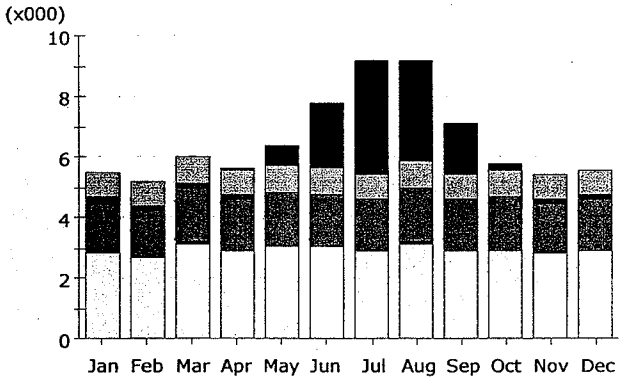
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	205.8	166.5	137.4	68.8	15.1	1.2	-	-	3.5	28.9	103.9	174.1	905.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	102.4	97.2	109.6	103.2	99.8	90.6	85.8	83.9	80.2	85.3	87.9	97.6	1,123.3
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	308.2	263.6	247.0	172.0	114.9	91.9	85.8	83.9	83.7	114.1	191.7	271.6	2,028.5

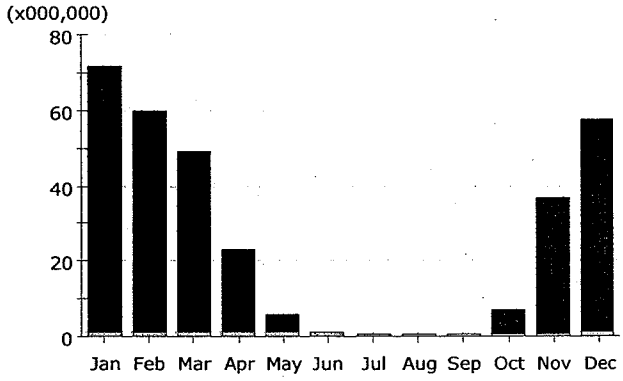
Meadow Walk at Lynnfield - Greenhouse Gas Analysis E-Quest Back-Up Files
Build Condition - Retail

Project/Run: Lynnfield_01_Retail - Baseline Design | Run Date/Time: 08/24/07 @ 10:16

Electric Consumption (kWh)



Gas Consumption (Btu)



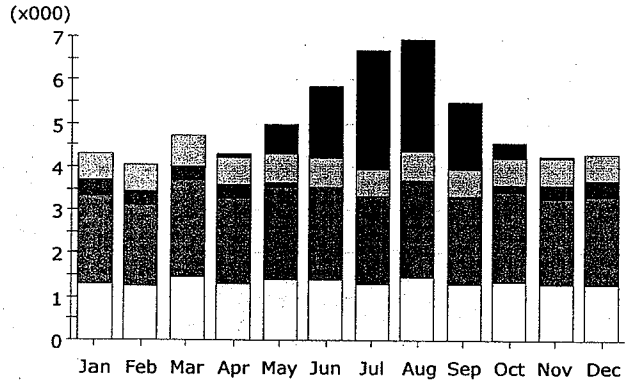
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.08	0.69	2.15	3.77	3.34	1.73	0.22	0.00	-	11.97
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.80	0.76	0.90	0.83	0.87	0.87	0.83	0.90	0.83	0.83	0.80	0.83	10.04
Pumps & Aux.	0.18	0.17	0.17	0.14	0.03	-	-	-	0.00	0.06	0.15	0.17	1.08
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.67	1.56	1.79	1.68	1.75	1.73	1.70	1.79	1.68	1.71	1.65	1.70	20.41
Task Lights	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Area Lights	2.80	2.67	3.14	2.88	3.03	3.02	2.88	3.14	2.88	2.91	2.79	2.88	35.02
Total	5.46	5.17	6.02	5.62	6.37	7.78	9.18	9.18	7.12	5.75	5.40	5.59	78.63

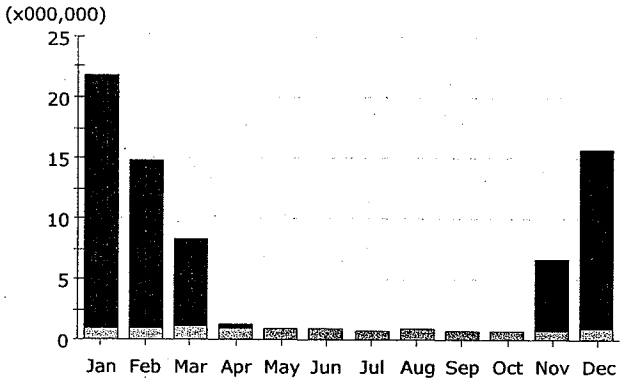
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	70.72	58.92	48.27	22.03	4.84	0.03	-	-	0.03	6.44	35.97	56.28	303.50
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.96	0.94	1.10	1.00	0.97	0.90	0.81	0.84	0.78	0.81	0.84	0.93	10.88
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	71.67	59.85	49.36	23.03	5.81	0.92	0.81	0.84	0.81	7.26	36.81	57.21	314.38

Electric Consumption (kWh)



Gas Consumption (Btu)



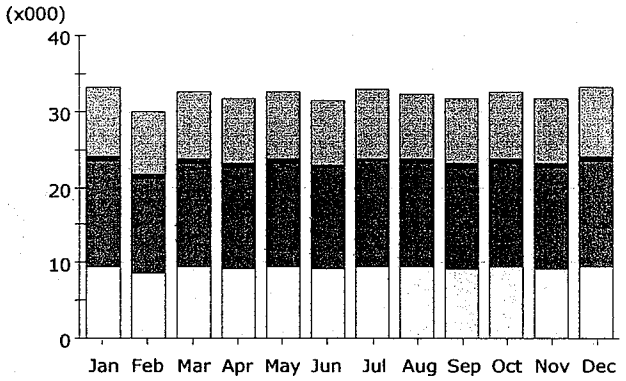
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.10	0.70	1.68	2.76	2.59	1.60	0.33	0.02	-	9.79
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.62	0.59	0.72	0.62	0.69	0.69	0.62	0.72	0.62	0.66	0.62	0.62	7.81
Pumps & Aux.	0.36	0.34	0.35	0.29	0.06	-	-	-	0.01	0.12	0.30	0.34	2.17
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.03	1.88	2.19	2.00	2.14	2.10	2.03	2.19	2.00	2.08	2.00	2.03	24.67
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	1.29	1.22	1.47	1.29	1.41	1.41	1.29	1.47	1.29	1.35	1.29	1.29	16.07
Total	4.31	4.03	4.73	4.30	5.00	5.88	6.71	6.97	5.52	4.54	4.23	4.29	60.51

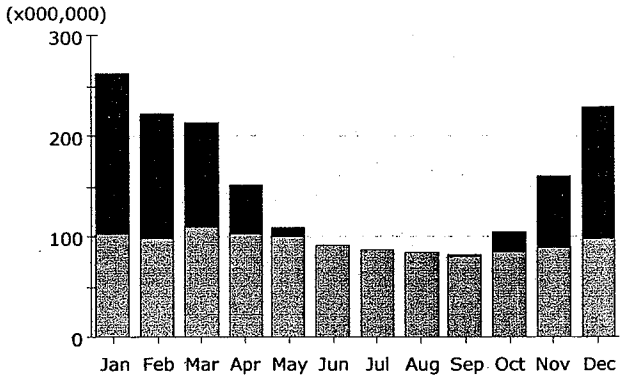
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	20.86	13.94	7.31	0.39	-	-	-	-	0.00	0.01	5.77	14.89	63.17
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.94	0.92	1.10	0.95	0.97	0.90	0.77	0.84	0.74	0.80	0.82	0.88	10.64
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	21.80	14.86	8.41	1.34	0.97	0.90	0.77	0.84	0.74	0.81	6.59	15.78	73.81

Electric Consumption (kWh)



Gas Consumption (Btu)



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	9.15	8.16	8.85	8.66	8.87	8.54	8.98	8.81	8.66	8.93	8.69	9.11	105.40
Pumps & Aux.	0.75	0.62	0.59	0.48	0.49	0.47	0.50	0.49	0.48	0.49	0.55	0.68	6.59
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	13.81	12.46	13.78	13.35	13.79	13.34	13.80	13.78	13.36	13.80	13.36	13.81	162.44
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	9.52	8.54	9.34	9.16	9.40	9.06	9.51	9.34	9.18	9.46	9.17	9.52	111.19
Total	33.21	29.78	32.56	31.66	32.55	31.42	32.80	32.42	31.67	32.68	31.76	33.11	385.61

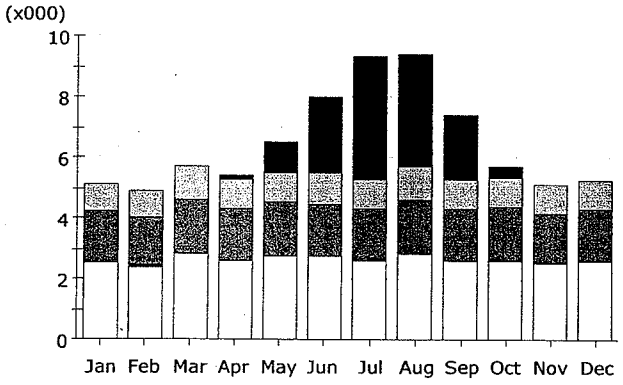
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	159.8	125.8	103.3	47.0	9.0	0.2	-	-	1.5	19.7	72.2	131.9	670.5
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	102.4	97.2	109.6	103.1	99.8	90.6	85.8	83.9	80.2	85.2	87.9	97.5	1,123.2
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	262.2	223.0	212.9	150.1	108.8	90.9	85.8	83.9	81.7	104.9	160.1	229.5	1,793.7

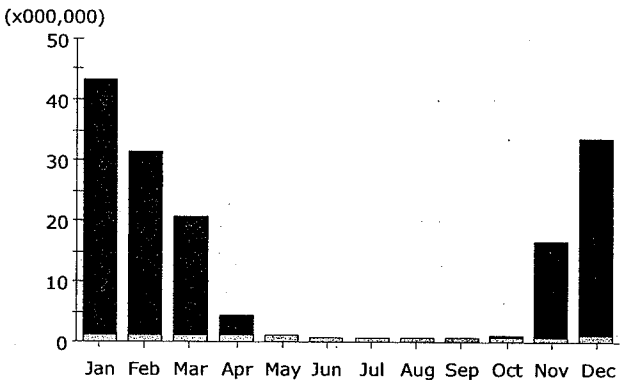
Project/Run: Lynnfield_Retail_mit_deir - Baseline Design

Run Date/Time: 01/18/08 @ 14:26

Electric Consumption (kWh)



Gas Consumption (Btu)



Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.14	1.00	2.51	4.05	3.71	2.19	0.42	0.02	-	14.03
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.94	0.89	1.06	0.97	1.02	1.02	0.97	1.06	0.97	0.98	0.94	0.97	11.76
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.67	1.56	1.79	1.68	1.75	1.73	1.70	1.79	1.68	1.71	1.65	1.70	20.41
Task Lights	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.10
Area Lights	2.52	2.40	2.83	2.59	2.72	2.72	2.59	2.83	2.59	2.62	2.51	2.59	31.52
Total	5.13	4.86	5.69	5.38	6.50	7.98	9.32	9.39	7.44	5.73	5.12	5.27	77.82

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	42.42	30.54	19.69	3.46	0.03	-	-	-	-	0.24	15.90	32.83	145.10
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.95	0.93	1.09	0.99	0.96	0.90	0.81	0.84	0.77	0.81	0.83	0.93	10.82
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	43.37	31.47	20.78	4.46	0.99	0.90	0.81	0.84	0.77	1.05	16.73	33.76	155.92

Total CO_2 Emissions

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
205B Lowell Street, Wilmington, MA 01887 • (978) 694-3200

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

April 1, 2008

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Lynnfield
Meadow Walk at Lynnfield
Walnut Street
EEA # 14096

Attn: MEPA Unit

Dear Secretary Bowles:

The Department of Environmental Protection has reviewed the Draft Environmental Impact Report (DEIR submitted by PHF-ND Colonial, LLC c/o National Development for a mixed-use development comprised of approximately 395,000 sf of retail, 80,000 sf of office, and 220 housing units with parking for 2,718 (Table 1-2) or 3277 (Table 2-1) vehicles on a 203 acre site in Lynnfield (EEA# 14096). The project increases the existing site development by 718,200 square feet for a 1,024,200 square foot project. The Department provides the following comments.

Wetlands

The DEIR indicates that conservation commissions in the towns of Lynnfield and Wakefield have accepted the wetlands delineations, and Orders of Resource Area Delineation have been issued. Although these resource areas are described and shown on site plans, numeric resource area labeling is used in the description, but alphabetic labeling is used on the plan, making it difficult to correlate wetlands information in the DEIR. It also would be helpful to have a plan depicting the offsite wetlands impacts and proposed replication.

Alteration of wetland resources for the proposed site roadway is estimated to be 210 square feet of land under water, 300 linear feet of bank, 1,380 square feet of bordering vegetated wetland, 22,650 square feet of bordering land subject to flooding (BLSF), and 610 square feet of Riverfront (page 3-11). The DEIR has not provided plans showing the area of BLSF impact or described mitigation for the floodplain loss, Figure 3.3 and page 3-14. From MassGIS FEMA overlay for the 100-year floodplain, where the floodplain boundary in MassGIS appears to potentially be more expansive than shown on the plans with the DEIR, it appears that the impacts would be in the vicinity of the LIFE, 40 residential units. The area of compensatory flood storage should be

identified to be a new volume, incrementally measured at each elevation including the 100-year flood elevation in an area that is not within the existing floodplain. Compensatory flood storage also should have an unrestricted hydraulic connection to the waterbody to be filled.

The wetlands section of the DEIR also does not discuss or show the wetlands alteration resulting from the proposed replacement culverts. Details on the changes in design, sizing, and impacts of the culverts should be provided, and any changes in hydraulics should be explained.

Wetlands replication is proposed for about 3,445 square feet of bordering vegetated wetland and 2,270 square feet of land under water.

401 Water Quality Certification

The proponent has filed an application with MassDEP for a 401 Water Quality Certificate.

Stormwater

The project indicates that it would comply with the MassDEP Stormwater Management Policy (SMP); however, the policy and standards were revised and incorporated into the wetlands and 401 Water Quality Certification regulations on January 2, 2008, and not all of the revisions in the regulations are reflected in the stormwater management plan provided in the DEIR. To ensure that the project complies with the regulations, consistent with updated information in the Stormwater Management Handbooks, Volumes One, Two, and Three, MassDEP recommends that the proponent review the stormwater plan for completeness with the Massachusetts Stormwater Report Checklist to ensure that future submittals are thorough. The checklist and additional information on the stormwater regulations are available on the following MassDEP website: http://www.mass.gov/dep/water/laws/policies.htm - storm.

The Department appreciates the commitment to use low impact development techniques including porous/permeable pavement, and biofiltration swales to supplement conventional stormwater management best management practices. -

The infiltration rates used for the hydrologic soils need to be changed in accordance with the revised stormwater regulations and standards. The recharge volume calculations are based on the SMP standards, which are no longer in effect.

Although the DEIR indicates that vegetated swales are proposed for infiltration (page 4-18), the revised Stormwater Management Handbook, Volume 2, Chapter 2, page 77 indicates that water quality swales may not be used for compliance with Recharge Standard 3.

The depth to groundwater below the proposed infiltration basins and trenches has not been clearly established for Pond 4B/4A, and it appears that the infiltration trench discharging to FES 10/10A may be intercepting the groundwater. In addition, the number of test pits in the vicinity of the infiltration systems needs to be increased, consistent with the Stormwater Handbook, Volume 2.

The DEIR indicates that an area in the vicinity of the parking lot and Boston Sports Club would not provide 80 percent total suspended solids (TSS) removal, but that the area still would

meet the Redevelopment Standard 7. However, the TSS calculations provided in the drainage report all indicate that TSS removal would exceed 80 percent. This inconsistency appears to demonstrate why the method used to estimate TSS removal is not appropriate, and that calculations should be provided for each discharge point and the order of the best management practices in the calculations should be the same as the stormwater system design.

Given that the proponent is proposing to widen the roadway in the vicinity of the Boston Sports Club, there would be an increase in imperviousness. Therefore, the project should meet the 80 percent TSS standard fully.

The Department reviewed the full size drainage plans, which were submitted with the Notice of Intent to evaluate the TSS removal, as the plans in the DEIR were too reduced in size to review accurately. The Department also used the automatic TSS calculation worksheet provided on the previously referenced MassDEP website. This worksheet automatically provides the appropriate TSS removal rate for the selected BMP, which ensures accuracy and uniformity. In doing this exercise, it was revealed that several discharge points would provide less than the required 80 percent TSS removal, including FES 13 (Sheet 4.3), FES 5 and 6 (Sheet 4.4), and FES 11 and 17 (Sheet 4.7).

The revised stormwater regulations also have more detail on the use of street sweeping TSS removal rates, to ensure that the sweeping program has the capability of achieving the rates identified. This issue will need to be addressed to demonstrate that the maximum of 10 percent TSS removal is appropriate.

The wetlands resources in the vicinity of the Lynn water supply intake at the Lynn Canal/Saugus River should be protected as a public drinking water supply, by treating the higher water quality volume of stormwater and meeting the Critical Area Standard 6. This would affect the stormwater management system draining to at least the discharge points labeled 3A, 4A, 5, 5B, 6, 11, 17, and 18, which do not appear to have been designed to capture and treat one inch of runoff multiplied by the impervious area.

The proponent will need to demonstrate compliance with the Stormwater Standard 10, by submitting an illicit discharge compliance statement confirming that no illicit discharges exist at the site, and by proposing pollution prevention measures to prevent illicit discharges to the stormwater management system.

In the redevelopment area of the site, the illicit discharge statement also needs to document that actions have been taken to identify and remove any existing illicit discharges. The site plans provided do not show the existing outfall for the detention basin in front of the Boston Sports Complex, which is close to the Lynn public water supply intake. The Department is requesting a copy of all documentation of the actions taken on this site to identify and remove illicit discharges.

Wastewater

The DEIR notes that the proponent has engaged in detailed discussions with the Massachusetts Water Resources Authority (MWRA) and the towns of Wakefield and Melrose on

wastewater management issues. As a result of these discussions, and in light of project impacts, the proponent has agreed to a mitigation plan that includes redirection of sewer flows in Melrose to relieve surcharge and overflow conditions, a study of infiltration and inflow (I/I) sources on the project site, and funds to identify and remove on-site and off-site infiltration and inflow in Wakefield. MassDEP has conferred with the MWRA and the town of Melrose on these matters, and concurs that the diversion of flows in Melrose is essential to the project, and will be required as an element of the MassDEP Sewer Connection permit. In addition, the I/I abatement work for this project must include wastewater system improvements that result in the removal of four gallons of I/I flow for each new gallon of flow from the proposed project. Therefore, 304,500 gallons of I/I must be removed from the project site or the downstream sewer system, based on 76,350 gallons per day of increased wastewater flow, which is estimated for the project. This I/I mitigation also will be a required element of the MassDEP sewer connection permit.

In addition, the project includes work to improve and replace existing sewer infrastructure in proximity to the Saugus River and Lynn Canal, which are used as source water for municipal drinking water. As such, the sewer work is subject to the MassDEP Policy BRP/DWM/WS/P03-1, which establishes construction requirements for protection of water supply resources. The Policy can be found at http://www.mass.gov/dep/water/laws/wsp03-1.doc. Compliance with these measures will also be a condition of the sewer connection permit.

Water Supply

The DEIR indicates that blasting is likely to necessary, and that all applicable regulatory requirements would be met. The DEIR also has made a specific commitment to prohibit the use of perchlorate-containing explosives, which have been linked to drinking water contamination (page 11-5).

Air Quality

Greenhouse Gas (GHG) Mobile Sources

The project proponent commits to the implementation of several recommended transportation demand management (TDM) measures designed to reduce vehicle trips and mobile source emissions including carbon dioxide (CO_2). The mobile source analysis indicates the TDM measures and other improvements result in a nearly 600 tpy CO_2 reduction. However, despite the CO_2 reductions derived from these improvements, the analysis indicates the Project 2012 Build Condition will still produce nearly 6,000 tpy CO_2 increase when compared to the No Build Condition in 2012. MassDEP recognizes the effort and expense by the proponent to reduce vehicle trips and mobile source emissions and encourages the proponent to pursue the following, additional measures to reduce project-related CO_2 emissions.

To address increased CO_2 emissions, MassDEP recommends that the FEIR analyze and provide a commitment to support and fund as necessary, a shuttle service linking the project with the Anderson Regional Transportation Center or other transit station, such as Oak Grove Station, that would best serve the residents, visitors, and employees of the project. MassDEP also recommends the FEIR provide a commitment to coordinate with Lynnfield and Wakefield town and state officials to explore, support, and fund as necessary, off-site bicycling initiatives, including on-road bike lane installation and route designation that would serve the project. The proponent also should consider additional offset measures, such as a commitment to support state or municipal climate action activities or other offset measures consistent with the *MEPA GHG Policy and*

Protocol. The FEIR should further explore these and other additional opportunities to avoid, minimize, or mitigate *indirect* impacts. Off-site measures should be consistent with the *MEPA GHG Policy and Protocol*, offsets provision.

MassDEP recommends that all air quality mitigation commitments identified in the DEIR and those additionally recommended by MassDEP shall be incorporated into Section 61 findings in the FEIR.

Greenhouse Gas (GHG) Stationary Sources

Buildings and their uses also have a significant effect on GHG emissions. According to the USEPA, residential and commercial buildings in the United States account for about 39 percent of emissions. The Green Building Council estimates that green homes, on average can save from 30 to 50 percent on energy and CO_2 emissions. This project estimates a combined direct and indirect CO_2 reduction of about 16 percent (12.8 percent total for mobile and stationary sources).

The Department has reviewed the GHG analysis for consistency with the GHG policy and to assess the measures that will be taken to reduce CO_2 emissions. The EQUEST Model was used to generate estimates of the categories of direct and indirect GHG sources. The stationary source data in Appendix H (DEIR volume with additional attachments) identifies the contribution to the categories of direct and indirect GHG emissions from each of the development uses, (existing, retail, residential, and office). However, it appears that only baseline data have been provided, and that these data, which differ somewhat, were generated on different dates. Data also should have been provided for the build with improvements to understand the energy reductions proposed for the preferred alternative. The data appear to suggest that energy use would be most significant in the residential development for hot water, space heating, and miscellaneous equipment. Has the proposed mitigation been targeted to reduce the CO_2 emissions from these stationary sources?

The DEIR evaluation of CO_2 emissions from stationary sources could be more consistent with the Policy by providing data and an analysis for at least one mitigation alternative that would result in higher GHG reductions than the preferred alternative. Alternatives with greater energy efficiencies are called for in the GHG policy to understand the potential opportunities for energy savings that can be achieved by varying building design and layout strategies. The policy also anticipates that an explanation would be provided to understand why better or more energy efficient techniques are not proposed, and that this information will be used in the determination that the alternative selected has avoided, minimized, and mitigated CO_2 emissions. Although the DEIR provides a table describing the mitigation options in terms of benefits and limitations, it is unclear why certain mitigation measures have been selected and others rejected.

The preferred alternative with improvements is estimated to reduce direct and indirect sources of GHG emissions by about 16 percent below the level of CO_2, predicted for the 2012 baseline build alternative. Is this alternative comparable to a code-compliant alternative, which is called for in the policy? The DEIR fell short in its demonstration that the preferred alternative would achieve significant reductions in GHG emissions with the proposed building design improvements and selection of building materials. It appears that greater reductions in CO_2

emissions could be achieved, according to nationally recognized energy efficiency programs, such as the USEPA energy star-rating program, which estimates that commercial buildings, including office buildings, can be designed to use 40 percent less energy and about 35 percent less CO_2 than the average building.

Construction Period Air Quality

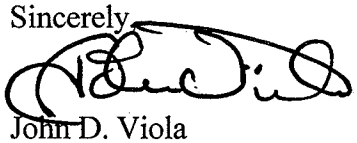
MassDEP recognizes that the project proponent is committed to pursuing a construction contractor that would participate in the MassDEP Diesel Retrofit Program to mitigate the construction-period impacts of diesel emissions to the maximum extent feasible (page 11-4).

Recycling

The Department commends the proponent for proposing to recycle about 80 percent of the construction and demolition materials from the construction site (page 11-3).

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Jack Zajac (978) 694-3240 for further information on the wastewater issues, and Mike Abell for additional information on wetlands and 401 Water Quality Certification issues. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338.

Sincerely,



John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Phil Weinberg, Jerome Grafe, Kathleen Romero, MassDEP-Boston
Kevin Brander, Jack Zajac, Criss Stephens, Jill Provencal, Michael Abell, Pam Merrill, MassDEP-NERO,
Town of Lynnfield, Conservation Commission, Town of Wakefield, Conservation Commission
City of Lynn, Water and Sewer Department

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
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SECRETARY

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May 30, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY & ENVIRONMENTAL AFFAIRS
ON THE
FINAL ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Meadow Walk at Lynnfield
PROJECT MUNICIPALITY	: Lynnfield and Wakefield
PROJECT WATERSHED	: North Coastal
EOEA NUMBER	: 14096
PROJECT PROPONENT	: PHF-ND Colonial, LLC
DATE NOTICED IN MONITOR	: April 23, 2008

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and Section 11.08 of the MEPA regulations (301 CMR 11.00), I hereby determine that the Final Environmental Impact Report (EIR) **adequately and properly complies** with MEPA and its implementing regulations.

Project Description

As described in the Expanded Environmental Notification Form (EENF) and updated in the Draft and Final EIR, the project consists of the construction of a mixed-use development on a 203-acre parcel in Lynnfield and Wakefield. It will include 395,000 square foot (sf) of retail space, 80,000 sf of office space, and 228-residential units. The housing will consist of 180 rental apartments (including 45 affordable units). In addition, six acres of land will be purchased by the Lynnfield Initiative for Elders (LIFE) for development of 48 units of moderate income housing for seniors.[1] The project includes retention of the northern half of the golf course as a 9-hole golf

[1] The Final EIR indicates that the LIFE project may add 8 units to the elderly housing community for a total of 228

course and construction of a new club house. The remainder of the golf course (including the existing club house) and the conference center will be demolished. The project includes improvements to the access drives, construction of an internal roadway system, construction of 2,718 additional parking spaces and installation/expansion of associated infrastructure and utilities, including a stormwater management system. The project is being developed under M.G.L. Chapter 40R Smart Growth Zoning and Housing Production legislation.

According to the EENF, potential environmental impacts include the creation of 38.2 acres of new impervious surfaces, alteration of 1,700 square feet (sf) of Bordering Vegetated Wetlands (BVW), alteration of 400 linear feet (lf) of bank, alteration of 2,150 sf of Land Under Water (LUW), 16,000 sf of Bordering Land Subject to Flooding (BLSF) and 600 feet of Riverfront Area (RA), and generation of approximately 19,079 average daily vehicle trips (adt) on a weekday, use of an additional 77,550 gallons per day (gpd) of water and generation of an additional 77,550 gpd of wastewater.

As described in the EENF, the site is bounded by Interstate 95 (I-95)/Route 128 and the Saugus River to the south, Audubon Road in Wakefield to the west, Walnut Street in Lynnfield to the east and Reedy Meadow to the north. The site contains an 18-hole golf course including a clubhouse and maintenance buildings, a 54,000 sf conference center, a 55,000 sf Boston Sports Club, 181,400 sf Sheraton Hotel and 975 parking spaces. The site has immediate highway access from I-95/Route 128 via Exit 42 (Pleasure Island Road) and Exit 43 (Walnut Street). The Saugus River provides habitat for the passage of the American eel (Anguilla rostrata), riffle habitat for spawning rainbow smelt (Osmerus mordax) and habitat for the passage, spawning and juvenile development of river herring (Alosa pseudoharengus and Alosa aestivalis). Reedy Meadow is a 540-acre freshwater marsh that has been designated by the National Park Service (NPS) as a National Natural Landmark. According to the 12th Edition of the Massachusetts Natural Heritage Atlas, the project is located within Priority and Estimated Habitats of Rare Species, including habitat for the American Bittern (Botaurus lentiginosus), the Common Moorhen (Gallinula chloropus) and the King Rail (Rallus elegans).

MEPA Jurisdiction and Required Permits

The project is undergoing review and requires preparation of an EIR pursuant to sections 11.03 (1)(a)(1), (1)(a)(2), (6)(a)(6) and (6)(a)(7) of the MEPA regulations, because the project requires state permits and will alter more than 50 acres of land, create more than 10 acres of new impervious surfaces, generate 3,000 or more new adt on roadways providing access to a single location and construct 1,000 or more new parking spaces at a single location. The project requires a Sewer Connection/Extension Permit and a 401 Water Quality Certificate from the Department of Environmental Protection (MassDEP). It requires an Access Permit from the Massachusetts Highway Department (MassHighway). The project requires the amendment of a sewer agreement with the Massachusetts Water Resources Authority (MWRA). Also, the project requires Orders of Conditions from the local conservation commissions in Lynnfield and

residential units and 48 units of senior housing.

Wakefield. The project must comply with the United States Environmental Policy Act (EPA) National Pollutant Discharge Elimination System (NPDES) General Permit for stormwater discharges from a construction site of over five acres.[2]

Because the proponent is not seeking financial assistance from the Commonwealth for the project, MEPA jurisdiction extends to those aspects of the project that may have significant environmental impacts and that are within the subject matter of required or potentially required state permits. In this case, MEPA jurisdiction exists over land alteration, traffic/transportation, air quality, wetlands, drainage, rare species and wastewater.

Review of the Final EIR

The proponent was permitted to prepare the Final EIR as a Response to Comments document because agreement was reached on most of the most of the major issues identified in the Certificate on the EENF and outstanding issues were limited to demonstration of compliance with the revised stormwater standards and specification of mitigation commitments. The Final EIR includes a revised Stormwater Management Plan (SMP), additional information on mitigation commitments and draft Section 61 Findings for all state agency permits. It provides a response to each comment letter provided on the Draft EIR and provides revised plans and additional information as requested or indicates where and how these issues will be addressed.

The Final EIR provides more detailed information regarding the widening of the Saugus River crossing including the design of proposed improvements, construction sequencing and mitigation. It indicates that the proponent will avoid work from February 15 through June 30 and intends to complete all in water work by September 1 to ensure adequate fish passage for the migration of eels. It identifies when water flow may be interrupted and describes the bypass flow system that will be constructed to maintain flow and adequate fish passage.

The Final EIR indicates that the SMP is consistent with the revised stormwater management standards that have been incorporated into the Wetlands Protection Act Regulations (310 CMR 10.05(6)(k)) and the Water Quality Certification Regulations (314 CMR 9.06(6)(a)). It also notes that a detailed Stormwater Pollution Prevention Plan (SWPPP) for construction activities will be developed and include more detailed information regarding use of sedimentation basins, temporary drainage swales, stabilization of slopes and stockpiled soils as well as a phasing plan.

The Final EIR directly addresses the issues raised by MassDEP on the SMP. Comments from MassDEP on the Final EIR identify a number of design issues that need to be addressed to ensure consistency with the revised stormwater standards and indicate that there are several discrepancies between the SMP and the Notice of Intent (NOI) plans. The proponent will need to address these issues during review of the 401 Water Quality Certificate to ensure that the design

[2] NHESP comments indicate that the project will not result in a "take" of a rare species; therefore, a Conservation and Management Permit is not required.

is consistent with the stormwater standards. Comments from the Saugus River Watershed Council indicate that it is satisfied with the Final EIR and proposed mitigation.

The Final EIR provides copies of the agreements developed with the MWRA (draft agreement) and the towns of Wakefield and Lynnfield regarding discharge of its wastewater to the Wakefield municipal system and how downstream capacity issues will be addressed. The proponent has committed to fund a study of infiltration and inflow (I/I) sources on the project site, provide funds to identify and remove I/I in Wakefield (on-site and off-site) and to redirect sewer flows in Melrose to relieve surcharge and overflow conditions. In addition, the Final EIR indicates that a Sewer Connection Permit application has been filed with MassDEP. Comments from MassDEP indicate that the proponent will need to identify specific I/I mitigation projects as a special condition in the MassDEP sewer connection permit.

Comments from the Executive Office of Transportation (EOT) indicate that the proponent has adequately analyzed the project's impacts, identified adequate mitigation measures to address impacts on the state highway system and indicate that no additional review is warranted. Comments on the Draft EIR from MassDEP, Saugus River Watershed Council and Walk Boston supported the establishment of a shuttle service as an effective approach to reducing vehicle emissions. The Final EIR indicates that the proponent will consider contributing up to $25,000 to initiate operation of shuttle service to the Oak Grove Rapid Transit Station or the Anderson Regional Transportation Center dependent upon the interest of tenants and residents.

Mitigation

The Final EIR includes an updated and revised section on mitigation measures including revised Draft Section 61 Findings for state permits. The Final EIR indicates that the proponent is committed to the following measures to avoid, minimize and mitigate project impacts:

- restoration and re-vegetation of a 25-foot buffer around Reedy Meadow(with the exception of the widened roadway);
- maintenance of a 150-foot buffer on the east side of the Saugus River and provision of public access, benches and interpretive information adjacent to the canal;
- provision of a water quality swale and additional plantings on the Wakefield side of the Saugus River;
- re-design of the Saugus River crossing to include a 20-foot wide, single span, precast concrete arch that will provide a natural river bottom to enhance fisheries habitat;
- development of a construction management plan to limit disturbance to river flow and fish passage;
- construction of a replacement wetland as mitigation for direct alteration of wetland resource areas;
- placement of a conservation restriction (CR) on 114 acres of the site, including the newly established buffer zones;

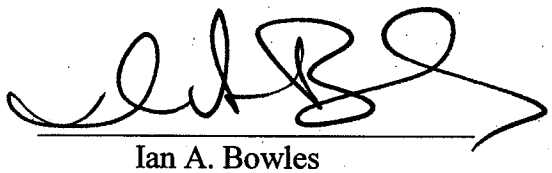
- $25,000 to fund a feasibility study to address the practicality of raising the summer water levels in Reedy Meadow for the benefit of state-listed marsh birds;
- construction of a multi-use path on the project site within the buffer to Reedy Meadow;
- design and construction of a SMP consistent with MassDEP stormwater standards which includes multiple low impact development techniques including 2.3 acres of porous pavement, permeable pavers, vegetated swales, naturalized detention basins and drought tolerant native plantings;
- prohibition on the use of perchlorate-containing blasting agents will not be used during construction;
- offset of wastewater flow on a 4:1 basis including identification and removal of I/I in Wakefield (on-site and off-site);
- redirection of sewer flows in Melrose to relieve surcharge and overflow conditions;
- incorporation of measures to reduce GHG emissions including use of highly-reflective roofing materials for 75% of flat roofs in the commercial and office buildings, maximize interior daylighting through floor plates, increased perimeter and use of skylights and light wells in commercial and office areas, window glazing to balance and optimize daylighting, heat loss and solar heat gain performance in all project buildings, use of high-efficiency HVAC systems in commercial and office areas, elimination of refrigerants in HVAC systems, incorporation of motion sensors, lighting and climate control in all public areas, recycling of 80% of construction and demolition materials from the site, use of efficient, directed exterior lighting for all buildings, provide construction and design guidelines to support sustainable design for tenant build-out, conservation and resource protection measures identified above and transportation-related measures identified below;
- geometric improvements, traffic signal installation and/or traffic signal coordination are proposed at the Audubon Road/Colonial Golf Club Driveway intersection, the Audubon Road/I-95 southbound ramps intersection, the Walnut Street/Salem Street/I-95 northbound ramps intersection, and the Walnut Street/I-95 southbound ramps/Colonial Golf Club Driveway intersection;
- interim mitigation measures for the Salem Street/Pleasure Island Road, Salem Street/I-95 northbound ramps and Salem Street/Montrose Avenue intersections in the event that MassHighway improvements are not completed prior to occupancy of the site;
- implementation of a TDM program including: an on-site Transportation coordinator, bicycle and pedestrian accommodations, a shuttle service for senior citizens, the provision of ZIP Car service, employer-based TDM measures and a commitment to provide up to $25,000 in start-up funds to support a shuttle service to the Oak Grove Rapid Transit Station or the Anderson Regional Transportation Center based on demand;
- consideration of use of a contractor that is participating in the MassDEP Diesel Retrofit Program to minimize construction related air quality impacts.

In addition, the NHESP letter on the Draft EIR identifies specific commitments the proponent has made to avoid a "take". These include:

- provide a draft recordable CR, showing the boundaries of the CR area, the boundary of the golf course play area within the CR area and a monumentation and signage scheme that will be approved by NHESP prior to the start of work;
- provide a revised planting plan that will be approved by NHESP prior to construction;
- incorporate information regarding the CR area and the Reedy Meadow area into the Operation and Maintenance Plans (O&M) for the golf course and development including the requirements to notify grounds crews of the presence of these restricted areas, to inspect the boundaries at least twice annually and to maintain signage and bounds;
- provide draft O&M plans to NHESP for review and approval prior to January 1, 2009; and
- development of a NHESP-approved escrow agreement for the $25,000 feasibility funds.

Based on consultation with state agencies, comment letters and a review of the Final EIR, I hereby find that the Final EIR adequately and properly complies with MEPA and its implementing regulations. The project may proceed to permitting.

May 30, 2008
Date



Ian A. Bowles

Comments Received:

5/23/08	Department of Environmental Protection/Northeast Regional Office (MassDEP/NERO)
5/22/08	Executive Office of Transportation (EOT)
5/23/08	Saugus River Watershed Council

IAB/CDB/cdb

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
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Secretary

LAURIE BURT
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May 23, 2008

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Lynnfield
Meadow Walk at Lynnfield
Walnut Street
EEA # 14096

Attn: MEPA Unit

Dear Secretary Bowles:

The Department of Environmental Protection has reviewed the Final Environmental Impact Report (FEIR) submitted by PHF-ND Colonial, LLC c/o National Development for a mixed-use development totalling 1,024,200 square feet (sf), including approximately 395,000 sf of retail, 80,000 sf of office, and 220 housing units with parking for 2,718 or 3,277 vehicles on a 203 acre site in Lynnfield (EEA# 14096). The project increases the existing site development by 718,200 square feet for a square foot project. The Department provides the following comments.

Stormwater

As there were no full size drainage plans to review with the FEIR, the Department again used those submitted with the Notice of Intent to evaluate the total suspended solids (TSS) removal. Absent a full size plan, however, it would not be possible for anyone to review the information in the FEIR on stormwater management system design to understand whether runoff impacts have been avoided and minimized for compliance with MEPA and the MassDEP stormwater management regulations.

The drainage calculations for TSS were revised to show conformance with the higher pretreatment requirements (44 percent) for critical areas and land uses with higher potential pollutant loads (LUPPLs). However, the terms, water quality inlet and Stormceptor, appear to have been used somewhat interchangeably in some of the TSS calculations to show that 44 percent TSS removal is achieved for pretreatment, even though the TSS removal ratings are different for these best management practices. In addition, the FEIR has not identified the model(s) of Stormceptor units proposed for use in the stormwater system design. Without this

information, it is not possible to concur that the TSS removal efficiencies used in the calculations are appropriate for the Stormceptor units.

In reviewing the subwatershed TSS removal calculations, MassDEP found the following discrepancies between the Notice of Intent (NOI) plans, the watershed plans (FEIR, Drainage study), and the TSS calculations; several of these issues, which are identified below, raise doubts that the stormwater system would be in compliance with the stormwater management regulations. For example, the stormwater management system has not provided 80 percent TSS removal prior to discharging stormwater toward the Lynn Water Supply canal.

- Subwatershed PR-1A: Although there are two drainage systems for stormwater from paved surfaces, there are no TSS calculations for the drainage system comprised of a trench drain and Water Quality Inlet 2.

- Subwatershed PR-1B: This watershed appears to drain into PR4-B.

- Subwatershed PR-2A: Similar to subwatershed PR-1A, there are two drainage systems for stormwater from paved surfaces; however there are no TSS calculations for the drainage system comprised of a trench drain and Water Quality Inlet 1.

- Subwatershed PR-4A and 4B: The calculations and watershed plan show these watersheds reversed, such that 4A in the calculations is shown as 4B on the plans. Also, the water quality inlet (WQI), and a Stormceptor unit appear to be reversed in the calculations and on the NOI set of plans, or alternatively, the terms are being used interchangeably, which is inappropriate given that the WQI is rated the same as an oil grit separator (25 percent TSS removal), while a Stormceptor unit may be rated higher, if sized, sited, and designed in accordance with the evaluations provided by the Strategic Envirotechnology Partnership (STEP), the Technology Acceptance Reciprocity Partnership (TARP), or another third party evaluator, (i.e., the Environmental Technology Verification program (ETV), which has been a collaborative technology evaluation program overseen by USEPA).

- Subwatershed PR-4A or 4B (depending on which drainage area only achieves 63 percent TSS removal): Because drainage discharges to a critical area, the system must be designed to meet the 80 percent TSS removal standard and all other applicable stormwater management standards. The FEIR indicates that grades in the area make it impracticable to achieve 80 percent TSS removal. However, the redevelopment standard does not apply under the revised stormwater management regulations, and furthermore, there are additional best management practices that can be used in this confined area to comply with the stormwater regulations. For example, an aggressive street sweeping program that is performed very frequently with high efficiency vacuum equipment and other proprietary best management practices could be used in this area.

- Subwatershed PR-3: The TSS calculations are based on deep sump catchbasins and the use of a Stormceptor unit. The stormwater system comprised of catch basins and a proprietary, particle separator does not comply with the stormwater regulations. As stated

in the Stormwater Management Handbook (SMH), Volume 2, Chapter 2, page 10, proprietary devices, "Must be used for pretreatment and placed first in the treatment train to receive TSS removal credit." Limiting their use in an area of higher potential pollutant load to pretreatment is appropriate, given there is limited pollutant removal and storage capacity in particle separators.

- Subwatershed PR-3: The calculations do not include the drainage system to, and including, an existing pond. On plan sheet LR-4-7, Water Quality Inlet (DCB6) outfalls to a pre-existing basin in front of the Boston Sports Club building. Hydrology sheets show that this flows to the Lynn water-supply Canal. None of the plans show an outlet for this basin and grades do not suggest overland flow. Will the drainage from all storm events be retained within the pond and subwatershed, as represented on the watershed plan? To meet Standard 10 of the stormwater regulations any outfall must be shown, as well as documentation verifying the methodology of any search for illicit discharges into the existing stormwater system.

- Subwatershed PR-1D: Although the calculations indicate that roof drainage is discharged to a grass channel (biofilter), the plans show all the roof drainage to be conveyed within pipes.

- Subwatershed PR-5B: Although the calculations indicate that drainage is discharged to an extended dry detention basin, the plans show a drainage system to subsurface systems.

- Subwatershed PR-6A and 6B: From the plans it appears that drainage in area 6A discharges to 6B. Since stormwater appears to be draining through both systems, why were the TSS calculations separated?

- On sheet LR-4-7 Water Quality Inlet (DCB6) outfalls to a pre-existing basin in front of the Boston Sports Club building. Hydrology sheets show that this flows to the Lynn water-supply Canal. None of the plans show an outlet for this basin and grades do not suggest overland flow. To meet Standard 10 of the Storm water Regulations investigation to locate the outfall and must be shown as well as documentation verifying the methodology of any search for illicit discharges into the existing storm water system.

The need for shut-off and control systems for best management practices draining to critical areas was discussed in a meeting between the proponent and MassDEP during the FEIR review. The Department anticipates that the proponent will submit revised drainage plans with shut off and containment capabilities for the drainage systems discharging to a critical area, including the public water supply intake canal, tributaries, and/or associated for compliance with Critical Area Standard 6.

Wastewater

The Supplemental Sewer Agreement (Attachment E) describes the funding plan for wastewater system improvements to relieve surcharge and overflow conditions in the town of Melrose. MassDEP will include this mitigation within the Section 61 Finding, associated with the MassDEP Sewer Connection permit.

As mentioned in the Department's DEIR comment, the infiltration/inflow (I/I) abatement work for this project must include wastewater system improvements that result in the removal of four gallons of I/I flow for each new gallon of flow from the proposed project. This means that 310,200 gallons of I/I must be removed from the project site or the downstream sewer system, based on 77,550 gallons per day of increased wastewater flow for the project. The FEIR has not identified specific I/I mitigation projects, as required in the Section 61 Finding and as a special condition in the MassDEP sewer connection permit.

Greenhouse Gas (GHG) Stationary Sources

A project at this early stage of development provides a multitude of opportunities for designing buildings and transportation management measures that reduce energy consumption and substitute renewable energy sources for fossil fuel sources. MassDEP believes that green developments are a smart financial investment. With a growing market demand for facilities that have reduced carbon footprints, rents are being driven higher for the US Building Council's Leadership in Energy and Environmental Design (LEED) certified buildings and Energy Star buildings than rents for less energy-efficient buildings, and occupancy rates are reported to be higher too by the CoStar Group[1], which released a study on rents, sales, and occupancy for energy efficient buildings in their commercial property database.

In a study from the New Buildings Institute (NBI), it was reported that building performance averages are 25-30 percent more efficient for LEED certified buildings than non-LEED buildings, and gold-platinum LEED rated buildings are 45 percent better than the national average, which approaches the interim goals of Architecture 2030, (a non-profit organization dedicated to reducing GHG emissions by changing the way developments are planned, designed, and constructed). The NBI study also shows a good correlation between modeled and actual building performance, providing assurances to developers and regulators that these measures will be effective. Additional information on energy efficiency/renewable rating systems is available at a number of websites including: http://www.buildinggreen.com/, http://energystar.gov/, www.architecture2030.org/. For new construction, core and shell, and commercial interiors relating to LEED certified buildings, information is available on the following website: http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222. In addition, for a Massachusetts perspective, consultation with green building experts can be obtained through the Green Building Roundtable: http://www.greenroundtable.org, located in Boston.

Many projects now routinely commit to orienting and designing buildings for energy efficiency, and this project has proposed to use highly reflective roofing materials (75 percent of the flat roofs), maximize day-lighting, window glazing, lighting controls, programmable

[1] The full study can be viewed at the CoStar Group Inc. website: http://www.costar.com/news/Article.aspx?id=D968F1E0DCF73712B03A099E0E99C679. CoStar Group Inc. is an information services organization serving commercial real estate in the United States and the United Kingdom.

thermostats, efficient exterior lighting, and high-efficiency HVAC systems. The DEIR estimated that these measures, the stationary sources of CO_2 for the project are estimated to decrease CO_2 by 16 percent below the 2012 Build estimate of 6,810.5 tons of CO_2 per year. As proposed, the project would not achieve an Energy Star rating, which requires a 35 percent reduction in CO_2 or LEED Certification ratings, which correspond with significant CO_2 reductions.

Higher CO_2 reductions and lower fuel costs would be achievable by incorporating on-site renewable energy sources into project. Large flat roofs, such as the Whole Foods grocer, can be designed with solar photovoltaic (PV) or, at a minimum, the roof should be constructed to support the added weight of a solar photovoltaic (PV) system for potential installation during project construction or at a future date. It should be noted that a rooftop PV system operates even more efficiently, due to added reflectivity, when installed on a white roof. Other energy efficient measures also need to be considered further to maximize the reduction in CO_2 that is potentially achievable, including solar orientation of buildings, automatic day-light dimming and other energy efficient interior lighting, (such as enhanced or Super T8 lighting, T5 or metal halide lighting, and LED lighting for all exit signs), sealing of all ducts, plenums, and equipment (no ductwork in exterior walls, no building cavities functioning as ductwork, and optimization of duct sizing for airflow), and incorporation of building energy management systems. Additional information on building design energy reduction measures and standards is available on many websites, including the following: http://www.eere.energy.gov/, http://www.nahb.org, www.sbicouncil.org, http://www.aceee.org, http://www.ashrae.org/, http://www.coolroofs.org/, and http://www.ornl.gov.

Construction Period Air Quality

The project proponent is committed to pursuing a construction contractor that would participate in the MassDEP Diesel Retrofit Program to mitigate the construction-period impacts of diesel emissions to the maximum extent feasible.

Recycling

The Department again acknowledges the proponent for proposing to recycle about 80 percent of the construction and demolition materials from the construction site.

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Jack Zajac (978) 694-3240 for further information on the wastewater issues, and Mike Abell at (978) 694- 3257 for additional information on wetlands and 401 Water Quality Certification issues. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Phil Weinberg, Jerome Grafe, Kathleen Romero, MassDEP-Boston
Kevin Brander, Jack Zajac, Criss Stephens, Jill Provencal, Michael Abell, Pam Merrill, MassDEP-NERO,
Town of Lynnfield, Conservation Commission, Town of Wakefield, Conservation Commission
City of Lynn, Water and Sewer Department

FEIR

Air Quality

The Proponent will implement physical and operational improvements to the roadways to reduce delays and queing, and also implement a TDM program as part of the Project in order to reduce Project-generated vehicle trips and to minimize peak-period traffic demands in the study area. The mitigation measures include:

- Install traffic signals at some of currently unsignalized intersections
- Widen roadways and reconfigure the lane usage
- Improve the traffic controls by keeping intersections coordinated and adjusting timing plans to maximize the efficiency of the traffic operations.
- Provide accommodations for Zipcar.
- Provide improved access from the Project to transit stations.
- Provide flexible hours so that employees have the option of commuting outside the peak traffic periods. Similar benefits can also be realized through staggered work hours so that employee trips occur over a broader period and thereby reduce peak hour demands.
- Massachusetts' employees have the ability to use pre-tax dollars for the purchase of MBTA passes. The pre-tax purchase is free from both federal and state income and payroll taxes.
- Consider telecommuting options.
- Offer direct deposit to employees.
- Provide a guaranteed ride home program to eliminate an often-cited deterrent to carpool and vanpool participation.
- Sponsor vanpools and subsidize expenses.
- Provide preferential carpool and vanpool parking within the parking garages and spaces near office building entrances as a convenience to participants and to promote ridesharing.
- Provide subsidies to employees who purchase monthly or multiple trip transit passes.
- Hold promotional events for bikers and walkers.
- Provide incentives for bicycle and HOV commuting.
- Appoint an on-site TDM coordinator to help promote all above-mentioned measures.

Greenhouse Gases

The Proponent has developed physical and operational mitigation measures to be included in the Project that would reduce or minimize GHG emissions from mobile sources and direct and indirect stationary sources. The following is a list of the mitigation measures that were considered for implementation and are reflected in the GHG analysis:

Architectural Design/Treatments

- Use highly-reflective (high-albedo) roofing materials for approximately 75 percent of the flat roofs in the commercial and office buildings.
- Maximize interior daylighting through floor plates, increased building perimeter and use of skylights and light wells in the commercial and office areas.
- Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance in all Project buildings.

Building Systems

- Install high-efficiency HVAC systems in commercial and office areas.
- Eliminate or reduce use of refrigerants in HVAC systems.
- Incorporate motion sensors and lighting and climate control in all public areas.
- Use efficient, directed exterior lighting for all Project buildings.
- Provide construction and design guidelines to facilitate sustainable design for build-out by tenants.

Siting and Site Design

- Provide permanent protection for open space on the Project site. The Project results in 114 acres of open space being placed under a conservation restriction.
- Conserve and restore natural areas on-site. As part of the preservation of 114 acres of open space on the project site, the Proponent will restore a significant buffer zone area along the boundary with Reedy Meadow.
- Minimize building footprint. A majority of site parking will be located under Project buildings.

Transportation Measures

- Install traffic signals at some of currently unsignalized intersections
- Widen roadways and reconfigure the lane usage
- Improve the traffic controls by keeping intersections coordinated and adjusting timing plans to maximize the efficiency of the traffic operations.
- Provide accommodations for Zipcar.
- Provide senior shuttle service.
- Provide improved access from the Project to transit stations.
- Provide flexible hours so that employees have the option of commuting outside the peak traffic periods. Similar benefits can also be realized through staggered work hours so that employee trips occur over a broader period and thereby reduce peak hour demands.
- Massachusetts' employees have the ability to use pre-tax dollars for the purchase of MBTA passes. The pre-tax purchase is free from both federal and state income and payroll taxes.
- Consider telecommuting options.
- Offer direct deposit to employees.

- Provide a guaranteed ride home program to eliminate an often-cited deterrent to carpool and vanpool participation.
- Sponsor vanpools and subsidize expenses.
- Provide preferential carpool and vanpool parking within the parking garages and spaces near office building entrances as a convenience to participants and to promote ridesharing.
- Provide subsidies to employees who purchase monthly or multiple trip transit passes.
- Hold promotional events for bikers and walkers.
- Provide incentives for bicycle and HOV commuting.
- Appoint an on-site TDM coordinator to help promote all above-mentioned measures.

Consistent with the Project's commitment to improve the environment, Whole Foods Market will be one of the major tenants in the retail component of the Project. Whole Foods Market is environmentally active and a leader in implementing "Green Actions" such as using environment-friendly, or LEED-certified, building materials in the new stores and using alternative energy sources (wind power, solar and biomass). Sustainable design measures will be incorporated into the Project to the maximum extent possible. Whole Foods Market's efforts will help further reduce greenhouse gas emissions in the study area.

The Commonwealth of Massachusetts

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10/15/08 (7P)

NOTE
*Comment letters missing from MEPA Files

October 10, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMI
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Southwest Service Area Redevelopment Program at Boston-Logan International Airport
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 14137
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: July 9, 2008

As Secretary of Energy and Environmental Affairs, I hereby determine that the Draft Environmental Impact Report (DEIR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00). The proponent may prepare and submit for review a Final Environmental Impact Report (FEIR). This Certificate outlines the issues pertaining to the project presented in the DEIR.

Project Description

As described in the DEIR, the proponent, the Massachusetts Port Authority (Massport), is proposing a two-phase project to redevelop the Southwest Service Area (SWSA) at Logan International Airport. The SWSA is presently occupied by the taxi pool, a bus/limousine pool, a flight kitchen and six rental car businesses. A seventh car rental agency will soon relocate to the airport with an eighth moving once the project is operational.

The total 2.7 million gross feet (gsf) project, now at five percent design, is construction of

a five-level, 50-foot +/- high garage to house car rental facilities and up to 3,000 commercial parking spaces. The project will include 270,000 square feet (sf) of space for a car rental customer service center (CSC) and maintenance and storage areas for rental car operations, which are referred to as quick turnaround areas (QTAs), which provide fueling, car washing and cleaning facilities, and vehicle storage. The DEIR also describes as part of the project a shared shuttle bus system, rather than the existing eight individual shuttles, a reconfigured taxi pool, roadway and intersection improvements, site access improvements, landscaped buffers, and new pedestrian and bicycle facilities. To accommodate the project, the taxi pool and limousine pool will be relocated (the taxi pool will be increased) to the north of Porter Street within the SWSA. The flight kitchen and bus pool will be moved to another area on the airport. Bicycle access and parking will be provided. Vehicle trips per day (VTD) will increase by about 7,570 from about 24,180 to 31,750.

MEPA Background

In its annual (EEA #3247) Environmental Status and Planning Reports (ESPRs) and Environmental Data Reports (EDRs) for the airport dating back to 1993, Massport has contemplated making the SWSA more efficient through the development of enhanced transportation facilities, including a consolidated rental car facility (the "ConRAC") and commercial parking. Data reported shows that the project should prove to have significant positive environmental impacts. However, at the same time, I have received comments which have expressed concerns with the impacts upon the existing transportation infrastructure, air quality issues, and impacts of massing upon adjacent neighborhoods. To facilitate development of an FEIR that adequately avoids, minimizes and mitigates impacts to environmental resources, I expect the proponent will continue to work closely with the state and city agencies and authorities, as well as neighbors and neighborhood organizations that have provided detailed comments on the DEIR.

MEPA Jurisdiction and Permitting Requirements

The project is undergoing review and subject to the preparation of a mandatory EIR pursuant to section 11.03 (6)(a)(6) and section 11.03 (6)(a)(7) of the MEPA regulations, because the project involves the generation of 3,000 or more new additional trips on roadways providing access to a single location and the construction of more than 1,000 new parking spaces at a single location. Because the proponent is an Authority of the Commonwealth, MEPA jurisdiction extends to all aspects of the project that may cause significant Damage to the Environment as defined in the MEPA regulations.

The project will require an Order of Conditions from the Boston Conservation Commission for work within the buffer zone to wetlands resources (if the local Order were appealed, the project would require a Superseding Order from the Department of Environmental Protection (MassDEP)). I note that as of January 12, 2007, a certification statement with

MassDEP is required for new sewer connections where flows exceed 15,000 gallons per day (gpd) and are less than 50,000 gpd. Because the wastewater flow from the project is estimated to be less than 50,000 gpd, the proponent does not require a sewer extension/connection permit from MassDEP. However, the Massachusetts Water Resources Authority (MWRA) has indicated that a MWRA Sewer Use Discharge Permit will be required for wastewater discharges to the sanitary sewer system. Currently, Logan International Airport holds a USEPA-NPDES General Permit for its construction activities. For the SWSA Redevelopment Project, Massport must comply with Logan International Airport's USEPA-NPDES General Permit for Stormwater Discharges from its construction activities.

Coordinated MEPA/FAA/NEPA Review

In addition to the EIR requirement, the project is undergoing review pursuant to the Federal Aviation Administration (FAA) and the National Environmental Policy Act (NEPA) in an Environmental Assessment (EA). Both NEPA and MEPA regulations allow (and encourage) the preparation of joint EIR/EA documents. As noted at the outset of this review process, I believe coordinated review is a good government practice, both in terms of allowing for maximum public and agency understanding of the project and to ensure that review by regulatory agencies is as efficient as possible. I hereby authorize and encourage the preparation of a joint Final EIR/Final EA for the proposed project.

Review of the DEIR and Scope of FEIR

I am allowing the proponent to proceed to the preparation of an FEIR; however I note the requests by commenters for additional information and clarification to assist State agencies with future permitting processes. I have received numerous comments on the project from both project supporters and project opponents. While I appreciate the thoughtful comments submitted by all of the commenters, MEPA is not a zoning process, nor is it a permitting process. Rather, it is a process designed to ensure public participation in the state environmental permitting process, to ensure that state permitting agencies have adequate information on which to base their permit decisions and their Section 61 Findings[1] and to ensure that potential environmental impacts are avoided, minimized, and mitigated to the maximum feasible extent. The FEIR should therefore be responsive to the Scope set forth below, and as referenced above, I expect that the proponent will continue to work closely with agencies and the public on other aspects of the project outside this Scope.

I anticipate that the FEIR will respond to the scope outlined below with sufficient detail

1 In accordance with M.G.L. c. 30, section 61, any Agency that takes Agency Action on a Project for which the Secretary required an EIR shall determine whether the Project is likely, directly or indirectly, to cause any Damage to the Environment and make a finding describing the Damage to the Environment and confirming that all feasible measures have been taken to avoid or minimize the Damage to the Environment.

to satisfy State agencies. I retain my authority to require further review issues outlined in this Scope and in comments in the form of a Supplemental Final Environmental Impact Report if those issues are not thoroughly addressed in the FEIR. The FEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Certificate.

Project Description & Regulatory Environment

The FEIR should include a detailed description of the project with a summary/history of the project. It should provide an existing and a proposed site plan. The FEIR should repeat the description of each state agency action required for the project that is contained in the DEIR and include any updates. It should show that the project is consistent with the applicable performance standards. The FEIR should contain sufficient information to allow the permitting agencies to understand the environmental consequences related to the project.

Response to Comments

In order to ensure that the issues raised by commenters are addressed, the FEIR should include a response to comments. I recommend an indexed response to comments approach, although I will defer the final choice of format to the proponent. This directive is not intended to, and shall not be construed to, enlarge the scope of the EIR beyond what has been expressly identified in the initial scoping certificate or this certificate.

Alternatives

The proponent has filed this project with MEPA early in the design process and has committed to continue public meetings to address issues such as parking and traffic circulation, building architecture, and buffer and streetscape design.

The Preferred Alternative presented in the DEIR combines a ConRAC facility and commercial parking into one five-level structure. The ConRAC is limited to the lower three levels. Commercial parking would be located on two levels above the ConRAC and would share the common shuttle bus for access to and from the Terminals. The DEIR proposes that to keep common shuttle bus traffic away from the airport property edges along the community and closer to the airport roadway network and within the SWSA to reduce community impacts. The Preferred Alternative proposes a five-level combined/consolidated garage for both activities. The combined structure increases operational efficiencies and has less visual impact to the nearby community.

In addition to the proponent's Preferred Alternative, the DEIR analyzed the no-build alternative to establish baseline conditions. The alternative would continue current and future rental car operations in SWSA with each rental car agency in a separate location with individual

shuttle bus and customer service facilities. The DEIR also analyzed "Alternative 1" a six-level ConRAC structure on the north side of the SWSA away from Maverick Street with direct operational flow from the garage with a separate five-level commercial garage located in the eastern section of the SWSA across Jeffries Street. Under Alternative 1, the shuttle bus route exiting to Porter Street would create a poor level-of-service at the Porter Street/Harborside Drive intersection. "Alternative 2" proposed two, smaller six-level ConRAC structures with a separate five-level commercial parking structure on the eastern portion of the SWSA across Jeffries Street. Alternative 2 would circulate common bus shuttle traffic at the Maverick Street edge and results in inefficient on-site circulation

The DEIR also discussed additional alternative site locations that included relocating all rental car operations to other on-airport locations including:

- The Robie Parcel which was not adequate in size or location to accommodate the current and future rental car needs and would likely add vehicle miles traveled (VMTs) if used in connection with rental car operations.
- North Service Area which was not adequate in size or location to accommodate the current and future rental car needs and was not accessible to roadway and highway system.
- North Cargo Area which was not adequate in size or location to accommodate the current and future rental car and currently accommodates air cargo and essential airline support services such as hangars.
- Bird Island Flats/South Cargo Area which was not adequate in size or location and could interfere with primary cargo area with secured airside access

The FEIR should continue to provide updated information on transportation and buffer streetscape design to the surrounding neighborhood in relation to the Preferred Alternative.

Traffic/ Vehicular Transportation

The DEIR was prepared in conformance with the EOEA/EOTC Guidelines for EIR/EIS Traffic Impact Assessment. It analyzed traffic impacts by determining the Level-of-Service (LOS) at the intersections required in the ENF Certificate and the Boston Transportation Department (BTD) comment letter. The DEIR identified the potential Transportation Demand Management (TDM) measures that the proponent will commit to implementing.

Vehicle trips per day (VTD) will increase by about 7,570 from about 24,180 to 31,750 attributed the increase to the projected growth in air passengers. The DEIR analyzed how the proposed common shuttle bus system will improve customer service, reduce curbside traffic congestion, and reduce vehicle-miles-traveled (VMT). Specifically, VMTs for rental car shuttles are projected to be reduced by approximately 50 percent with a common shuttle bus system compared to running separate shuttles for seven rental car companies and the commercial parking. This equates to a savings of approximately 2,470 miles daily and over 215,000 gallons

per year of fuel (bus fuel efficiency of 4 miles per gallon). Analysis in the DEIR shows that without the SWSA Redevelopment Program and associated ground access improvements, the projected growth for most of the major current uses in the SWSA (rental cars, taxis, limousines) would lead to an overload of the surrounding airport roadway and traffic congestion during 2012 and 2017 No-Build/No-Action Conditions. Also, with the relocation of the Bus and Limousine Pools and shuttle bus consolidation into a common bus system, the projected Build traffic volumes entering and leaving the SWSA would be between six and ten percent less than the traffic volumes associated with 2012 and 2017 No-Build/No-Action Conditions. Proposed ramp, roadway and intersection improvements will result in peak hour traffic volumes and daily VMTs that are better than 2012 and 2017 No-Build/No-Action Conditions. The DEIR states that existing designated, overflow and economy commercial parking will be consolidated within the SWSA while remaining within the requirements of Logan Airport Parking Freeze. This action will not therefore increase traffic to and from the airport, but will consolidate this parking-related traffic in one location.

The DEIR predicts the number of air passengers using Logan Airport will grow at a rate of 2.3 percent per year and assumes that the percentage of taxi, rental car, and limousine traffic entering and exiting the SWSA will increase accordingly. Under the SWSA-Build condition, trip generation will increase from 26,080 - 30,680 AWDT in 2012 and 28,905 - 33,985 AWDT in 2017. The DEIR estimates the proposed project achieves an overall trip volume reduction of 6 to 10 percent of traffic entering and exiting the SWSA site. However the relocation of the bus and limousine pool will increase vehicle trips to the North Service Area (NSA). In the FEIR, the project proponent should take into account the shift in trips from the SWSA to the NSA. The FEIR also should indicate how Logan Airport air passenger and ground service peak activity periods, such as Sunday afternoon and evening arrival periods are accounted for in the traffic analysis. Also Massport has committed to comply with the Massachusetts Idling regulation (310 CMR 7.11). The proponent should post idling restriction signs in all loading and drop-off areas within the site to remind all drivers, patrons, and delivery personnel of the state's idling regulation.

The FEIR should use the study methodology contained in the detailed BTD comment letter to govern the remaining traffic analysis and issues that are still outstanding. The FEIR should continue to working with BTD, EOT and the community to identify further mitigation measures for areas where the project will have a significant impact on traffic operations. The FEIR should include clear commitments to implement the mitigation, and describe the timing and any phasing of the mitigation.

Pedestrian/Bicycle

The DEIR described design standards for plantings, street furniture, signage, and sidewalk and crosswalk widths and paving to ensure that the pedestrian environment generally is appealing and efficient. The FEIR should continue to discuss methods of improving pedestrian

safety and facilities, and limiting pedestrian-vehicular conflicts. Within the DEIR Massport has committed to improving pedestrian and bicycle connections to the SWSA, the community, and the airport. I expect the proponent to continue to work closely with the City of Boston and other local neighborhood groups, agencies and landowners to coordinate streetscape design and the Airport Buffer Program described in the DEIR. The FEIR should describe with more detail the plans to ensure that these areas especially are designed as pedestrian corridors and attractive urban open spaces.

Parking

The proposed project is a two-phased (2012 Phase 1 and 2017 Phase 2) redevelopment of the Southwest Service Area (SWSA). MassDEP has stated in its comment letter that while rental car storage spaces are not regulated under the Parking Freeze, the provisions of the Parking Freeze allow Massport to manage its parking space inventory on Logan Airport property as operational needs require so long as Massport does not exceed the inventory limiting number of 17,319 commercial and 3,373 employee parking spaces. The FEIR must address the specific comments that have raised questions related to the Parking Freeze and detail how each phase of the project will comply with the mandates of the Parking Freeze.

The FEIR should provide additional information relative to the fuel use and emissions reductions expected from the common shuttle bus operation. Consistent with the requirements of the Parking Freeze, the FEIR should provide information on Massport's plans and efforts to relocate any remaining East Boston based rental car facilities or operations that serve Logan Airport and are not part of the proposed consolidation onto Logan Airport.

Air Quality

The DEIR contains an air quality assessment with a microscale analysis of localized carbon monoxide (CO) and particulate matter (PM2.5 and PM10) conditions, a mesoscale analysis of volatile organic compounds (VOCs) and nitrogen oxides (NOx) emissions in the project study area, and a greenhouse gas analysis to quantify carbon dioxide (CO2) emissions. The greenhouse gas analysis, as described in detail in the next section of the Certificate, compared the direct and indirect emissions from the combined stationary and transportation sources under the respective 2007 existing condition and respective Build and No Build conditions for 2012 and 2017.

As stated in it comment letter, MassDEP approved the modeling parameters used in the microscale and mesoscale analyses and accepts the modeling assumptions of the greenhouse gas analysis and accuracy of the analyses' results. Several commenters have raised concerns about the methodology used which MassDEP has approved. The FEIR should clarify the issues raised by those letters and further detail and justify the approved modeling parameters and analyses. This additional discussion should include, but not be limited to, further description of how the

approved methodology accounts for the impact of cold starts and the extent to which the impacts of ultrafine particulates have been analyzed.

The microscale analysis within the DEIR applied atmospheric dispersion modeling for CO and PM2.5 and PM10 and "hotspot" modeling for roadway/intersections. The atmospheric dispersion modeling was conducted using the US Environmental Protection Agency's (EPA) AERMOD, Massachusetts-specific MOBILE 6.2 motor vehicle emission factors and meteorological data collected at Logan Airport. The CO "hot-spot" modeling was conducted using the EPA CAL3QHC model combined with Massachusetts-specific MOBILE 6.2 motor vehicle emission factors. I note the comments of EPA seeking clarification with respect to the analysis of CO emissions. Subsequent to the close of the public comment period, the proponent supplied additional information with respect to CO emissions. This additional information and any updates should be included in the FEIR.

The DEIR's mesoscale analysis predicted VOC and NOx emissions using the current US EPA emission model (MOBILE 6.2), and traffic flow conditions for the respective 2007 existing condition, and respective Build and No Build conditions for 2012 and 2017. The mesoscale analysis also was used to estimate the indirect emissions from transportation CO2 emissions associated with the additional project related vehicle trips. The calculation compared CO2 emissions for the respective 2007 existing condition, and respective Build and No Build conditions for 2012 and 2017.

The results of the atmospheric dispersion modeling and hotspot modeling indicate that the proposed project concentrations are well below NAAQS for CO and PM10/2.5. The mesoscale analysis indicates the proposed project is expected to reduce NOx emissions by 23.1 and 6.33 tons/year in 2012 and 2017, respectively, when compared to Future No-Build Conditions. The proposed project also is expected to result in reductions of up to three percent in VOC emissions when compared to the 2012 and 2017 No-Build Conditions.

The transportation related air quality benefits associated with the proposed project are largely derived from the reduction of vehicle trips, roadway improvements, and the proposed TDM measures. The FEIR should explore additional TDM measures which may yield further air quality benefits.

Greenhouse Gases

As outlined in the Certificate on the ENF, in accordance with the EEA Greenhouse Gas Emissions (GHG) Policy and Protocol, the DEIR was required to quantify GHG emissions generated by the proposed project and describe all GHG mitigation measures associated with the project. In the DEIR CO2 emissions associated with the SWSA Build Conditions are reported as 11,927 metric tons of CO2 /year by 2012, and 12,836 metric tons of CO2 /year by 2017. These values represent a 17 percent and 15 percent decrease in SWSA-related CO2 emissions when

compared to the corresponding 2012 and 2017 No-Build Conditions, respectively.

As noted by MassDEP, although the DEIR quantified CO2 emissions from mobile sources under the Preferred Alternative (as compared to the No-Build conditions) and presented measures to avoid, minimize and mitigate project-related GHG emissions, it did not include a modeling analysis of the energy use and CO2 emissions from the project's direct and indirect stationary sources which should be included in the FEIR. The DEIR represented that CO2 emissions would be reduced under the Preferred Alternative as the Preferred Alternative incorporates a number of sustainable design measures beyond a code-compliant building. However, the impact of those measures needs to be quantified in the FEIR.

As recommend by MassDEP and DOER, the energy modeling for stationary sources in the FEIR should reflect all of the specific mitigation measures selected for the building design, including the following:

- Interior natural daylighting through clearstory windows and/or skylights;
- High-efficiency lighting and lighting system controls, including motion sensors; The FEIR needs to identify specifically the lighting that will be used and reflect it in the energy modeling.
- Efficient, directed exterior lighting;
- High-albedo roofing materials;
- Energy-efficient mechanical systems and high-efficiency HVAC systems; The FEIR needs to specify the systems that will be used and reflect it in the energy modeling.
- Architectural elements on the façade that accommodate natural ventilation;
- Window glazing; and
- Independent building control systems.

The DEIR states that the project will strive to meet the Mass LEED Plus program. The Mass LEED Plus standard established by the Sustainable Design Roundtable calls for energy performance in buildings greater than 20,000 sq ft, "to exceed MA Energy Code requirements by at least 20 percent." Meeting this standard would be in keeping with the MEPA GHG Policy which states that the project baseline for energy usage should be based on code-compliant buildings. Therefore, energy mitigation measures for the project must extend beyond meeting the MA State Building Code. However, the FEIR also needs to clarify the standard the project intends to meet. According to the Department of Energy Resources (DOER) the MA LEED plus requirement of 20 percent energy cost savings or as 20 percent energy efficiency over the baseline is not the same as the MA LEED Plus standard issued by the Sustainable Design Roundtable.

As the project design advances, I strongly encourage the proponent to consider the feasibility of incorporating additional measures to reduce GHG emissions. In particular, the DEIR mentions that the proponent is investigating rooftop photovoltaic (PV) systems for the Customer Service Center and micro-wind on the parking structure. In addition, the proponent

has indicated an interest in evaluating the use of PV systems on the parking structure as well. New installation technologies allow for PV units to be arrayed above parking spaces, maximizing utilization of space and solar exposure as well as additional shading of the building below. The proponent should work with the Executive Office of Energy & Environmental Affairs and DOER to assess the feasibility of these measures at the ConRAC parking facility. The proponent's analysis of the feasibility of these measures should take into consideration the likely continued rise in the electricity prices, the continued reduction in the cost of PV, opportunities for third party PV arrays with power purchase agreements, new opportunities for utility ownership of solar installations, and the new requirements and standards in the Green Communities Act, Chapter 169 of the Acts of 2008.

Finally, the proponent should consider the additional energy use required to provide water and wastewater treatment for the project when evaluating the overall GHG reductions that can be obtained through mitigation efforts. The FEIR should include an update on any additional measures incorporated to the project that will help reduce project-related GHG emissions. I encourage the proponent to consult with the MEPA Office concerning the additional analysis required by this section.

Sustainable Design

A development the size of the proposed project presents a host of opportunities for incorporating sustainable design elements and sustainable construction into project design, consistent with the goals of Executive Order 484 and Executive Order 385. Sustainable design elements, over the course of the project design life, can both prevent environmental impacts and reduce operating costs to the proponent. The DEIR states that the site design will:

- Follow sustainable principles/LEED criteria for siting/sustainable sites (e.g., walking distance to public transportation).
- Complete the Phase 2 SWSA Landscape Edge Buffer;
- Enhance pedestrian and bicycle path connections for the community to airport facilities and public amenities such as Memorial Park and the Airport T-Station;
- Locate the garage and support structures to shield the adjacent neighborhoods from airport roadways and aircraft noise;
- Commit to incorporate principles of sustainable design in all aspects of design, construction, and operations; and
- Strive to achieve a LEED Silver level rating and the goals of the MA LEED Plus program.

I remind the proponent that stormwater regulations require that consideration be given to low impact development (LID) and the use of integrated management practices (IMP) for control of stormwater, either alone or in combination with conventional drainage control measures. LID is an approach to stormwater management that minimizes runoff impacts by maintaining and mimicking existing hydrologic functions through site design techniques such as disconnecting

runoff flow pathways and dispersing stormwater control across the site, reducing imperviousness, and minimizing clearing and grading while preserving natural resources and drainage patterns. When combined with pollution prevention measures, LID can be less costly than conventional gutter and pipe drainage system and can provide redundancy for stormwater control.

Drainage/Stormwater

The existing stormwater system for the project consists of catch basins and underground piping that flow to Maverick Street and Porter Street Outfalls. The DEIR states that the project is expected to improve the quality of runoff by upgrading stormwater management facilities site-wide, replacing uncovered vehicle surface parking with buildings and decreasing paved area. The DEIR states that the project will reduce almost three acres of impervious surface area due to new landscape buffer area, along with new and upgraded stormwater facilities would be included as part of the SWSA Redevelopment Program, thus improving the overall stormwater runoff quality from the site. Under Existing Conditions, portions of the SWSA discharge stormwater to the BWSC Porter Street Outfall. The proposed new stormwater system will reduce combined sewer overflow (CSO) discharge volumes and all stormwater will be conveyed to the existing Maverick Street Outfall, which has sufficient capacity for anticipated flow. I note that the NPDES permit (No. 0000787) was issued jointly by USEPA and MassDEP. Therefore, MassDEP's review of the proposed stormwater drainage system for compliance with the stormwater management standards extends to the entire 49 acres of the Southwest Service Area.

The stormwater drainage from the proposed Southwest Service Area is being directed to the Maverick Street outfall, where it may be necessary to attenuate drainage rates sufficiently to avoid CSO overflows, unless a credible and conservative stormwater analysis demonstrates that peak runoff rate controls are unnecessary. In this application, the Rational Method, as described in MassDEP's comment letter, is not appropriate to estimate potential flow attenuation to the CSO outfall. In order to properly evaluate the likelihood of unanticipated CSO occurrences, the FEIR must evaluate the runoff rate using TR20/TR55 method described in MassDEP's comment letter as well as the flow model required to be developed by the NPDES permit for Outfalls 001, 002, and 004.

The MassDEP Stormwater Standard 3 in conjunction with Stormwater Standard 7 requires recharge to be provided to the maximum extent practicable. Given the DEIR indicates the tidally influenced high groundwater is about 6 to 8 below grade, it would appear to be practicable to induce groundwater recharge. Although the DEIR mentions drywells are being investigated, a greater commitment to provide stormwater recharge must be made in the FEIR. In addition, the stormwater management system needs to be designed to treat one inch of runoff multiplied by the impervious area because the project site is a land uses with higher potential pollutant loads (LUHPPL), and stormwater will be discharged to a critical area.

The criteria for compliance with Standard 7 for redevelopment projects are more detailed

under the stormwater regulations than the Stormwater Management Policy. The Stormwater Management Handbooks require submittal of a complete set of computations to demonstrate that the structural best management practices (BMPs) meet standards 2 through 6, in addition to demonstrating that existing conditions have been improved. Because of the requirements for calculations, it cannot be affirmed that the stormwater management system design described in the DEIR is in conformance with the redevelopment standard. This information must be provided in the FEIR.

Wastewater

The DEIR included estimates of project water use and wastewater generation, and it demonstrated that adequate infrastructure exists or will exist to support the water supply and wastewater demands. The DEIR also described the infrastructure improvements necessary to accommodate projected wastewater flows.

The SWSA currently receives potable water from the City of Boston Water and Sewer Commission (BWSC) which obtains water from the Massachusetts Water Resources Authority (MWRA) system. The MWRA handles the wastewater generated from the SWSA, which is ultimately treated at the Deer Island Sewage Treatment Plant in Boston Harbor. The SWSA Redevelopment Program would require 108,300 gallons per day (gpd) of potable water and would generate 89,553 gpd of wastewater (based on DEP Title 5 guidelines). There will be a small increase in water usage and wastewater generation under the 2012 and 2017 Build Conditions due to the increase in vehicles and passengers accessing the consolidated rental car and commercial parking garage. In accordance with the goals of the MA LEED Plus program, the DEIR states that the project will reduce water use demand through the utilization of high-efficient, low flow plumbing fixtures, car wash water reclamation systems, and water efficient landscaping (e.g., use of low-water demand vegetation and native plantings). In addition, the design of the new sanitary and stormwater drainage systems would result in an overall reduction in combined sewer overflow volumes from the Porter Street Outfall and Maverick Street Outfall Drainage Areas.

MWRA is currently completing final design of the federally court ordered East Boston Branch Sewer Relief project intended to bring CSO discharges along the East Boston shoreline into compliance with the federal Clean Water Act and state water quality standards. Any increase in flow to the East Boston system may contribute to greater surcharging and overflows during wet weather. MassDEP, in cooperation with MWRA and its member communities (including Boston), are implementing a flow control program in the MWRA regional wastewater system, to remove extraneous clean water (e.g., infiltration/ inflow (I/I)) from the system.

Pursuant to 360 C.M.R. 10.023(1), the MWRA prohibits the discharge of groundwater to the sanitary sewer system, except in a combined sewer area when permitted by the Authority and the municipality. The proposed construction site of the SWSA Redevelopment Project at Logan

International Airport has access to storm drains and it is not located in a combined sewer area; therefore, the discharge of groundwater to the sanitary sewer system associated with this project is prohibited. Currently, Logan International Airport holds a USEPA-NPDES General Permit for its construction activities. For the SWSA Redevelopment Project, I reiterate as staed in the ENF certificate that Massport must comply with Logan International Airport's USEPA-NPDES General Permit for Storm Water Discharges from its construction activities.

Water Conservation

Although the main sources of GHG from this project are associated with building heating and cooling, lighting, and vehicle travel, the energy required to provide potable water and treat wastewater also will be a source of GHG, and in particular CO2. The DEIR states that Massport's goal is to reduce water use by about 20 percent and landscape irrigation by 50 percent. The DEIR also indicates that for compliance with MA LEED Plus criteria, water use demand will be reduced by installing high-efficiency low flow plumbing fixtures, car was water reclamation systems, and water efficient landscaping. As noted above, the FEIR also should quantify the effect of the low-flow fixtures and equipment that will be installed to reduce water demand. To achieve water and energy savings goals, consideration also should be given to using HVAC equipment with advanced evaporator coils, which have been reported to reduce water loss by about 50 percent and energy demand by up to 25 percent. Other mitigation measures appropriate for reducing energy use for water and wastewater are water distribution system improvements to eliminate un-accounted for water losses and infiltration and inflow (I/I) removal from sewer mains, which also is required to offset wastewater generated by the project which has the potential to increase sewer and combined sewer overflows.

Wetlands

The majority of the 49-acre site is not with a wetlands resource area or buffer zone. Wetlands jurisdiction extends to a small section of Harborside Drive within a buffer zone to wetlands, for which a Notice of Intent (NOI) is required to be filed. It also appears that the replacement of tidegates and stone dissipators at the outfall would entail work within coastal bank and land under water. A plan (C-2) in Appendix G (Sheet 2 of 3) shows replacement of tidegates at and/or near the Maverick Street outfall, which should be explained in the FEIR, because there is no mention of this work in the DEIR.

Noise

The DEIR contained an assessment of project-related noise impacts on appropriately sited nearby residential receptors. By consolidating and improving the efficiency of existing rental car operations, the DEIR states that the project will help to reduce overall future noise levels in adjacent neighborhoods. The project would result in the relocation of several existing noise sources away from the adjoining neighborhoods. The relocation of existing Bus and Limousine

Pools to the North Service Area would eliminate the current use of buses on Tomahawk Drive/Hotel Drive Extension and Jeffries Street. The number of shuttle buses serving the facility would be reduced because individual buses for each rental car company would be consolidated into a common shuttle system. In addition, shuttle bus traffic would be relocated farther from the airport property edge and the community in a shielded location on the opposite side of the parking structure and improved traffic-flow patterns for the shuttle buses would reduce or eliminate occurrences of shuttle bus back-up alarms.

Wind Impacts

The DEIR contained an analysis of pedestrian level wind impacts as it relates to air quality impacts associated with the project. The DEIR concludes that the results of a wind analysis demonstrate that the proposed SWSA Redevelopment Program (including the ConRAC facility and associated parking structure) is not expected to have any significant effect on pedestrian-level winds near the project or in the adjoining neighborhoods. The only predicted exception to this is near the corners of the garage structure and only under high wind conditions where planned landscaping in these areas will help minimize these potential effects. The FEIR should provide where available more details to the planned landscaping that will minimize wind consitions.

Visual Impacts

The DEIR contained an analysis of the visual impacts of the proposed project, including elements as viewed from nearby residential areas. The visual impacts are being reviewed by the City of Boston for building design. The FEIR should contain any updates of the visual analysis that occur.

Massachusetts Contingency Plan (MCP)/M.G.L. Chapter 21E

The DEIR contained an update on the status of the clean up efforts on the Release Tracking Numbers (RTN) areas for the site and the additional investigations in accordance with the Massachusetts Contingency Plan (MCP). I note that this project site is being regulated under MGL c. 21E (3-1611). Activities within the SWSA, particularly storage and transfer of petroleum products, have resulted in releases to the subsurface. Releases of Oil and Hazardous Material (OHM) by tenants were reported to MassDEP. According to the DEIR all but one of the RTNs have been closed out, with three resulting in the filing of an Activity and Use Limitation (AUL). The other RTN was assigned in August 2007 and the area is still under investigation. The three AUL areas will require that a soil management plan be developed by a Licensed Site Professional (LSP) and submitted to MassDEP prior to construction within those areas. The DEIR states that decommissioning of the existing rental car facilities will include the removal of older fueling systems and associated tanks (in accordance with applicable public safety regulations), which will be replaced with new state-of-the-art systems. The project will also

include the remediation of subsurface contamination encountered during tank removals or other excavation activities. The DEIR also projects that replacing open surface parking areas with a parking structure would reduce the runoff from parking lots and its incidental hydrocarbon loading. The FEIR should contain any updates on the status of the clean up efforts on the RTN areas for the site.

Recycling Issues

The project includes demolition and reconstruction, which will generate a significant amount of construction and demolition (C&D) waste. By incorporating recycling and source reduction into the design, the proponents would have the opportunity to join a national movement toward sustainable design. The project proponent should be aware there are several organizations that provide additional information and technical assistance, including WasteCap, the Chelsea Center for Recycling and Economic Development, and MassRecycle.

MassDEP commends the proponent in its comment letter for recognizing the importance of materials management within its DEIR filing for the Southwest Service Area redevelopment project. In order to address GHG emissions related to materials management in the FEIR, the FEIR should quantify the GHG impacts of materials management for the project development and projected future operation. By quantifying these impacts, the applicant's GHG mitigation efforts related to materials management can be more clearly identified and targeted appropriately. The FEIR should contain quantification to help guide changes in the project, which provide a comprehensive approach to materials management throughout the design, construction, and operational phases of the project.

Construction Period

The DEIR evaluated construction period impacts, with an emphasis on erosion and sedimentation, evaluation of the existing stormwater system and traffic impacts on adjacent roadways, air quality and solid waste disposal. The DEIR commits to a construction phasing plan that proposes to minimize disruptions in the project area and for the entire airport. Specifically, foundation work, such as pile driving, will be arranged for minimal impact and only occur for a relatively short period of time. Piles will be pre-augured through the upper 60 feet or more of soils, reducing the number of hammer blows required to seat the piles, therefore reducing the noise impact on the community. In order to reduce potential impacts from construction activities, Massport will implement a Construction Management Plan that will include:

- An Erosion and Sedimentation Control Program to minimize construction phase impacts to the nearby water resources.
- A requirement that construction contractors install emission control devices on certain equipment types in order to reduce impacts to air quality.
- Noise attenuation measures such as temporary noise barriers, re-routing traffic and/or

equipment mufflers that may reduce temporary construction noise impacts within the surrounding community. Pile driving will be required to comply with a project-specific noise specification that will reflect the requirements of City of Boston noise ordinances, and will restrict the types of equipment that can be used and may limit the hours when certain activities can take place.

- Recycling of the materials resulting from removal of the existing above ground building structures, along with the below-ground foundation slabs and footings, plus all other surface asphalt and concrete that is removed during demolition will divert construction waste from landfills.

I also advise the proponent to require all project contractors to install after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). MassDEP commends the project proponent for committing to installing these devices to reduce engine emissions.

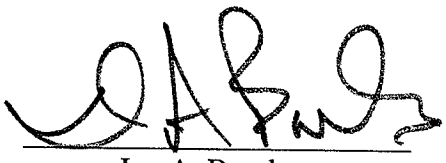
Mitigation/Section 61

The FEIR should include a separate chapter updating commitments to project-related mitigation. This section should include a summary of mitigation commitments as well as draft Section 61 finding language for use by State agencies during each individual permitting process.

The updated Section 61 findings should specify in detail all feasible measures the proponent will take to avoid, minimize and mitigate potential environmental impacts to the maximum extent practicable. Section 61 findings should identify and clarify parties responsible for funding and implementation, and the anticipated implementation schedule that will ensure mitigation is implemented prior to or when appropriate in relation to environmental impacts.

Circulation

The FEIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should also be sent to the list of "comments received" below and to Boston officials. A copy of the FEIR should be made available for public review at the Boston Public Library (East Boston Branch), the Revere Public Library, Chelsea Public Library and the Winthrop Public Library.



October 10, 2008
Date

Ian A. Bowles

Comments received:

09/08/2008 Boston Transportation Department

09/08/2008	Susan Parker Brauner
09/23/2008	Avis Budget Group, Dollar Rent A Car, Vanguard Car Rental USA, Dollar Thrifty Automotive Group, The Hertz Corporation, Enterprise Rent A Car
09/24/2008	Ida LaMattina of Gove Street Citizens Association
09/24/2008	Stacey and Jason Alstrom
09/24/2008	Jeffries Point Neighborhood Association
09/24/2008	Allyson Gray
09/25/2008	East Boston Community Development Corporation
09/25/2008	Environmental Protection Agency
09/25/2008	Richard Salini of East Boston Piers PAC
09/26/2008	Melissa Tyler
09/26/2008	Jonathan Ralton
09/26/2008	Department of Environmental Protection, NERO
09/26/2008	Peter Koff of Engel &Schultz, LLP
09/26/2008	Board of Trustees, Porter 156 Condominium Trust
09/26/2008	Susan Plunkett
09/26/2008	Massachusetts Department of Public Health
09/26/2008	Fred Salvucci
09/26/2008	Response to Comments from the Proponent
09/29/2008	Wig Zamore

IAB/ACC/acc

5

Air Quality

Overview

A key benefit of the SWSA Redevelopment Program is the opportunity to reduce air emissions associated with motor vehicle operations on the airport. This chapter presents the results of the air quality assessment conducted for the proposed program. Also included are brief discussions of relevant federal and state air quality regulations as well as summary listings of beneficial measures designed to help further reduce emissions and improve air quality conditions in the vicinity of the SWSA. Information, data and other materials collected, developed, and utilized in support of the air quality assessment are contained in Appendix E. An assessment of construction-related air quality impacts associated with the SWSA Redevelopment Program is contained in Chapter 10, *Construction*.

Key Findings and Benefits

- The SWSA Redevelopment Program, specifically consolidation of the rental car shuttle bus fleet, is a major component of Massport's goal to reduce motor vehicle emissions at Logan Airport by reducing total vehicle miles traveled (VMTs) associated with rental cars, taxis, limousines, vans, and buses traveling to, from, and moving about the airport and the SWSA.
- The results of the air quality assessment demonstrate that the SWSA Redevelopment Program would comply with the applicable air quality regulations, requirements, and initiatives.
  - Compared to Future No-Build/No-Action Conditions, the proposed SWSA Redevelopment Program is expected to reduce Oxides of Nitrogen (NO_x) emissions by 23.1 and 6.33 tons/year in 2012 and 2017, respectively. This represents 48 to 60 percent decreases in these emissions which are largely attributable to the corresponding reductions in the rental car shuttle bus fleet VMTs as well as the upgrading of the shuttle bus fleet with new, lower NO_x-emitting vehicles.
  - The proposed SWSA Redevelopment Program is also expected to result in reductions of up to 3 percent in Volatile Organic Compounds (VOC) emissions when compared to the 2012 and 2017 No-Build/No-Action Conditions.

- Greenhouse gas (GHG) emissions associated with the SWSA Redevelopment Program are predicted to decrease when compared to the 2012 and 2017 No-Build/No-Action Conditions. This decrease is attributable to the forecasted decrease in VMT by vehicles associated with the proposed program and Massport's commitment to reduce energy demands by 20 percent as a requirement for voluntarily meeting the MA LEED Plus program.

- The results of a wind analysis, requested in the Secretary's Certificate on the Environmental Notification Form (ENF), demonstrate that the proposed SWSA Redevelopment Program (including the ConRAC facility and associated parking structure) is expected not to have any significant effect on pedestrian-level winds near the project or in the adjoining neighborhoods. The only predicted exception to this is near the corners of the garage structure and only under high wind conditions. These locations are not pedestrian gathering locations, and planned landscaping in these areas will help minimize these potential effects.

Specific air quality benefits are inherent to the SWSA Program which would reduce Carbon Monoxide (CO), NO_x, VOC, and GHG emissions both locally and regionally. The most significant of these include the following:

- Using the LEED Green Building Rating System, the program will be designed, constructed and operated to be eligible for LEED certification. Massport will strive to achieve a LEED Silver rating and meet the requirements of the MA LEED Plus program, which would result in a reduction in energy use by at a minimum 20 percent (and thus reducing GHG and other emissions) through a combination of the following types of measures:
  - Microturbine units on the parking structure;
  - Solar panels possibly on the roof of the Customer Service Center (CSC);
  - Architectural elements on the façade that accommodate natural ventilation;
  - Highly-reflective (high-albedo) roofing materials;
  - Interior natural daylighting through clearstory windows and/or sky lights combined with high-efficiency lighting and lighting system controls;
  - Master and sub-system utility metering strategies;
  - Independent building control systems; and
  - Window glazing.
- Massport will require use of a common shuttle bus fleet to reduce VMTs between the ConRAC facility and commercial parking and the main terminals reducing terminal curbside congestion and the associated emissions.
- Improved employee and patron access to mass transit at the MBTA Blue Line Airport Station and the Silver Line stop at Terminal A would provide alternative means of access/ egress and reduce VMT and the associated emissions.

- A dedicated service road and loop at the ConRAC would provide efficient pick-up/drop-off to terminals and other ground transportation facilities and reduce emissions.
- "Smart Garage" features and technology including "pay-on-foot" and space availability notification systems would help reduce excess idling and associated emissions.
- Rental car storage areas and commercial parking facilities would have separate entrances/exits to reduce "roaming" VMT and associated emissions.
- Provisions for pedestrian and bicycle access to the site would reduce VMT and the associated emissions.
- Roadway/intersection improvements and traffic signal upgrades, located both within the SWSA and elsewhere on the airport, to primary access/egress routes would improve traffic flow, reduce stop-and-go driving and reduce excess emissions.
- Logan Employee Transportation Management Association (TMA) membership by SWSA employees would provide alternative means for accessing the site to reduce VMT and emissions.

Regulatory Context

Air quality at the airport is regulated by federal and state requirements. In addition, Massport's voluntary Air Quality Initiative (AQI) lays out its goal of maintaining Logan Airport-related NO_x emissions at, or below, 1999 levels.

Clean Air Act/State Implementation Plan

Currently, the entire Boston metropolitan region is designated by the U.S. Environmental Protection Agency (EPA) and Massachusetts Department of Environmental Protection (DEP) as an "attainment" area for all of the National and State Ambient Air Quality Standards (AAQS); with the exception of the eight-hour standard for ozone (O_3.)[1,2] This "non-attainment" designation for O_3 is further classified as "moderate" and is based upon air quality monitoring data collected by DEP at various locations throughout the area.[3] As a result of this designation and in accordance with the federal Clean Air Act (CAA), the DEP has developed a State

1 AAQS have been established for the following "criteria" pollutants: carbon monoxide (CO), lead Pb), nitrogen dioxide (NO_2), particulate matter less than or equal to 10 and 2.5 microns ($PM_{10/2.5}$), sulfur dioxide (SO_2) and ozone (O_3).

2 This current non-attainment designation applies to the eight-hour NAAQS for O_3 established by the U.S. EPA in 1997. The U.S. EPA has replaced this standard in 2008 and updated "attainment/non-attainment" designations will be made in the 2010/2011 timeframe.

3 This ozone non-attainment area comprises 11 counties, including Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk, and Worcester). Logan Airport is in Suffolk County.

Implementation Plan (SIP) which, focuses on, among others, the reduction and control of NO_x and VOC – the two primary precursors to O_3-formation.[4]

Federal General Conformity Rule

As a means of ensuring that continual progress toward achieving and maintaining compliance with the AAQS and SIP for O_3 are made, the General Conformity Rule of the Federal CAA establishes criteria (called "*de minimis*" levels) for NO_x/VOC emissions.[5] In brief, project-related emissions below these *de minimis* levels are automatically assumed to comply with the SIP and no further assessment of these emissions is required.[6] For O_3 precursors in the Boston metropolitan area, the applicable *de minimis* levels are 50 tons/year for either NO_x or VOCs.

MEPA Greenhouse Gas Emissions Policy and Protocol

In an effort to address the rising concern and awareness of the negative impacts of global warming and GHG emissions, the Commonwealth's Executive Office of Energy and Environmental Affairs (EEA) issued the *MEPA Greenhouse Gas Emissions Policy and Protocol*, and requires assessing and potentially mitigating impacts related to GHG emissions from new developments.[7] This Policy, to the extent that it is implemented through the MEPA process, requires project proponents to identify and quantify potential Project-related GHG emissions from mobile sources and direct and indirect stationary sources, and propose feasible measures to reduce GHG emissions be it through site/building design and/or building operations. The intent of the policy is to encourage project proponents to consider more carefully measures that would reduce or minimize GHG emissions.

The Commonwealth's effort to curb GHG emissions will:

- Help to slow the pace of global warming;
- Reduce fuel related emissions; and
- Promote the drive toward cleaner technologies.

As directed by the Policy, the following section assesses the Project-related GHG emissions from mobile sources and both direct and indirect stationary sources. While

4 Eight-hour Ozone Attainment Demonstration for the Massachusetts Portion of the Boston-Lawrence-Worcester, Massachusetts-New Hampshire Ozone Non-attainment Area, prepared by the Massachusetts Department of Environmental Protection.

5 40CFR Part 51, Determining Conformity of General Federal Actions to State or Federal Implementation Plans, November 30, 1993.

6 In cases where total emissions of NOx/VOC exceed the applicable *de-minimis* levels, the project is not automatically assumed to conform to the SIP and a formal General Conformity Determination must be made.

7 The Policy requires that projects undergoing review under MEPA (Mandatory EIR) quantify the Project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions.

GHG emissions include several gases, Carbon Dioxide (CO_2) was selected for evaluation because it is the most significant component of Project-related GHG emissions.

■

Logan Air Quality Initiative

At Logan Airport, Massport has voluntarily implemented an ozone management program, the *Air Quality Initiative* (AQI), to prevent NO_x emissions associated with the airport from exceeding 1999 emission levels.[8] Emission sources addressed in the AQI include aircraft, GSE, motor vehicles traveling on the airport's roadway network and parking facilities (including those associated with the existing SWSA), and a variety of stationary sources (i.e., Central Heating Plant, emergency generators, snow melters, etc.). NO_x emission levels are reported annually in the Logan Airport Environmental Status and Planning Reports (ESPRs) and Environmental Data Reports (EDRs). According to the *2006 EDR*, NO_x emissions have remained well within this yardstick.[9]

Air Quality Assessment

In accordance with the Secretary's Certificate on the ENF and with National Environmental Policy Act (NEPA) guidelines, the air quality assessment comprises the following analyses:

- Mesoscale Analysis of Ozone (O_3) Precursors;
- Microscale Atmospheric Dispersion and Carbon Monoxide (CO) "Hot-Spot" Modeling and particulate matter assessment (PM);
- Greenhouse Gas Analysis; and
- Pedestrian-Level Wind Analysis.

For each analysis, the assessment criteria and modeling methodology is documented.

The principle sources of air emissions currently associated with the SWSA are motor vehicles traveling to, from, and moving about the area. These include automobiles (i.e., cars and vans), taxis and limousines, step-vans, shuttles, transit buses, and trucks associated with the rental car facilities, parked vehicles and vehicles associated with, staging areas, the Flight Kitchen, and a nearby hotel. Other, less significant, sources of emissions include back-up electrical generators, food-preparation services,

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8 Logan International Airport Air Quality Initiative (AQI), prepared by Massport, 2000. (VOC emissions are not covered under the AQI.)

9 *Boston-Logan International Airport, 2006 Environmental Data Report (EDR)*, Submitted to Executive Office of Energy and Environmental Affairs, MEPA Office, submitted by Massachusetts Port Authority Economic Planning & Development, September, 2007.

underground fuel storage tanks, and limited automobile "through" traffic from the nearby neighborhoods. Future development plans for the SWSA are not expected to alter these classifications of emissions substantially, with the exceptions of the limousine/transit buses staging areas and the Flight Kitchen facility which would be relocated to other areas of the airport.

Emissions from aircraft engines, aircraft auxiliary power units (APUs), ground support equipment (GSE), various other stationary sources at the airport as well as airport-related motor vehicles traveling on the local and regional roadway networks are not associated with and would not be altered as a result of the SWSA Redevelopment Program.[10] These emission sources are comprehensively assessed and quantified by Massport in the annual Logan *Environmental Data Report / Environmental Status Progress Report* (EDR/ESPR) for Logan Airport.[11]

The air quality analysis analyzed the following conditions:

- 2007 Existing Condition
- 2012 No-Build/No-Action Condition
- 2017 No-Build/No-Action Condition
- 2012 Build Condition (Phase I)
- 2017 Build Condition (Phase II/Full Build)

These analysis conditions were selected so that changes related to background conditions could be distinguished from changes related to the proposed redevelopment program. Comparison between the 2012 and 2017 No-Build/No-Action and Build Conditions in the same year show operational changes that are projected to occur as a result of the proposed program. The horizon years of 2012 and 2017 were selected based on the expected construction completion dates for Phase I and Phase II /Full Build of the SWSA Redevelopment Program.

Mesoscale Analysis

The mesoscale analysis of O_3 precursors quantifies the amounts of NO_x and VOCs associated with the SWSA Redevelopment Program. Reported in the format of an emissions inventory, the results (expressed in tons/year) are used to evaluate the proposed program's potential impact on regional O_3-formation. This information helps to ensure that the project-related emissions comply with the SIP, meet the

10 Other stationary sources of emissions include the Central Heating Plant, fuel storage and hydrant system, snow melters, the ARFF "live-fire" training facility , ventilation shafts associated with the harbor tunnels, and other back-up generators situated around the main terminal complex and other parts of the airport.

11 *Boston-Logan International Airport, 2006 Environmental Data Report (EDR)*, Submitted to Executive Office of Energy and Environmental Affairs, MEPA Office, submitted by Massachusetts Port Authority Economic Planning and Development, September, 2007.

requirements of the CAA General Conformity Rule and (for NO_x emissions) are consistent with the goals of the Logan AQI. For comparative purposes, the analysis is conducted for the 2007 Existing Condition, the 2012 and 2017 No-Build/No-Action Conditions, and 2012 and 2017 Build Conditions. Chapter 4, *Transportation and Parking* provides a detailed description of the two phases of the proposed program which would be implemented in 2012 and 2017.

Mesoscale Analysis Methodology

The mesoscale analysis was conducted using methods, models and emission factors approved by the U.S. EPA and DEP combined with development plans and operational data specific to the SWSA Redevelopment Program. As discussed above, because motor vehicles are the primary source of emissions associated with the proposed program, they are also the focus of this analysis.

Traffic data (in the form of VMT) were derived for several categories of program-related motor vehicle trips (i.e., rental cars, taxis, shuttle/transit buses, etc.) traveling on roadways located within the Traffic Study Area (see Chapter 4, *Transportation and Parking*). Traffic on the internal SWSA roadways and parking facilities were also included in the analysis, as were periods of vehicle engine idling (i.e., along building curbsides and in vehicle staging areas). Motor vehicle emission factors were obtained from the U.S. EPA MOBILE6.2 using DEP-recommended input data reflecting Massachusetts motor vehicle fleet mix and operating characteristics.[12]

Emissions associated with back-up generators and other stationary sources associated with the SWSA were based on actual permitted emission rates, annual fuel throughput volumes, or appropriate vender specifications for the equipment.

2007 Existing Condition

Figure 5.1 shows the existing air quality receptors. Air emissions associated with existing SWSA sources include mobile sources (automobiles, rental cars, buses, trucks, limousines in roadways and parking lots) and stationary sources (Flight Kitchen and heating/ventilation units).[13] The mesoscale analysis considered total O_3 precursor emissions of NO_x and VOCs associated with the SWSA activities. As shown in Table 5-1, emissions of NO_x and VOCs under 2007 Existing Condition are 78.3 and 11.1 tons/year, respectively. These results provide a basis of comparison for the change in future-year emissions. Chart 5-1 below illustrates the results of the mesoscale analysis.

12 Communications between DEP and KB Environmental Sciences, March, 2008.
13 Motor vehicles associated with relocating the bus and limousine pool to the North Service Area were also included in the assessment.

Table 5-1
Mesoscale Analysis Results (tons/year)[1],

Pollutant	2007 Existing Condition	2012			2017		
		No-Build/ No-Action	Build	Difference[2]	No-Build/No-Action	Build	Difference[2]
NO_x	78.3	40.9	15.2	-25.8	19.4	10.6	-8.76
VOCs	11.1	7.68	7.46	-0.22	5.93	5.85	-0.08
De minimis Levels[3]				50			50

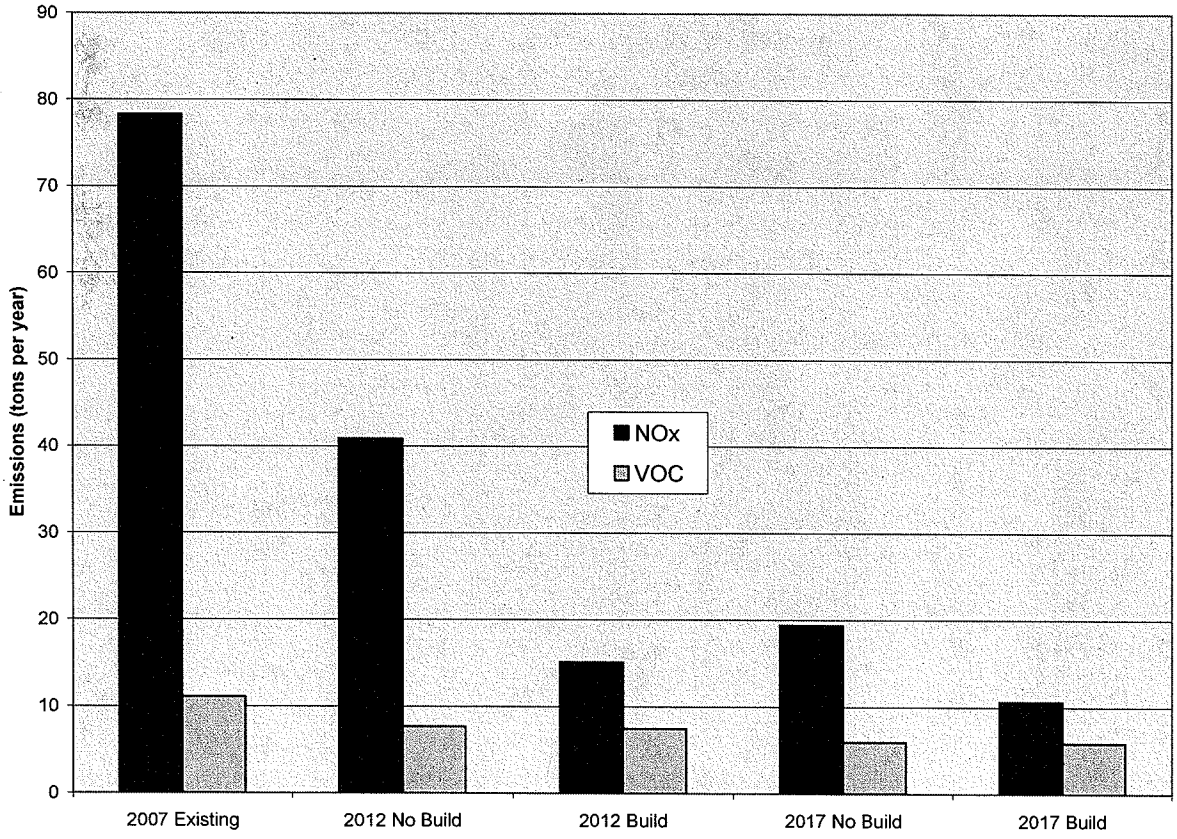
NOx – nitrogen oxides, VOCs – volatile organic compounds

1 Appendix E contains a detailed breakdown of the mesoscale analysis results by sources category (i.e., roadways, parking lots, stationary sources, etc.).

2 Differences = Build – No-Build/No-Action

3 The applicable *de minimis* levels are 50 tons/year for either NOx or VOCs. Emissions below these levels are automatically assumed to comply with the State Implementation Plan (SIP).

Chart 5-1
Mesoscale Analysis Results (tons/year)



Future Conditions

Figure 5.2 shows the future air quality receptors under the 2017 Build Condition. The results of the future-year mesoscale analysis for the SWSA Redevelopment Program

are summarized and discussed in this section for both the 2012 and 2017 No-Build/No-Action and Build Conditions. In both 2012 and 2017, NO_x and VOC emissions are lower under the Build Condition, when compared to the No-Build/No-Action Condition.

Because the CAA General Conformity Rule applies to the difference in emissions between the 2012 and 2017 No-Build/No-Action and Build Conditions, comparison of existing emissions to the *de minimis* levels is inappropriate However, compared to the Logan AQI, the total NOx emissions represent less than two percent of the overall total for Logan Airport. Because the *Logan AQI* is reported in units of kilograms/day (kg./day) and only for NO_x, a comparative analysis between these SWSA Redevelopment program related emissions and the AQI follows separately.

Future No-Build/No-Action Conditions

As shown in Table 5-1, total emissions of NO_x and VOCs under the SWSA 2012 and 2017 No-Build/No-Action Conditions are predicted to be 40.9 and 7.68 tons per year and 19.4 and 5.93 tons per year, respectively. These results provide a basis of comparison for the change in future-year emissions attributable to the 2012 and 2017 Build Conditions, which are presented below.

Compared to the Logan AQI, the total future-year NO_x emissions under the 2012 and 2017 No-Build/No-Action Conditions represent less than one percent of the overall total for Logan Airport.

Future Build Conditions

The proposed SWSA Redevelopment Program would result in air quality improvements in both NO_x and VOC emissions, when compared both to 2007 Existing Conditions and 2012 and 2017 No-Build/No-Action Conditions. As shown in Table 5-1, with the SWSA Program, total emissions of NO_x and VOCs associated with this facility are 15.2 and 7.46 tons per year in 2012, and 10.6 and 5.85 tons per year in 2017, respectively. Compared to the 2007 Existing Condition, these values represent decreases (33 to 81 percent in 2012 and 47 to 86 percent in 2017) due to the forecasted decreases in motor vehicle emission factors state-wide and the reduction of program-related VMT over this time period.

Compared to 2012 and 2017 No-Build/No-Action Conditions, the proposed SWSA Redevelopment Program is expected to reduce NO_x emissions by 25.8 and 8.76 tons per year in 2012 and 2017, respectively. This also represents 45 to 63 percent decreases in these emissions, which are largely attributable to the corresponding reductions in the rental car shuttle bus fleet VMT as well as the upgrading of this fleet with new, lower NO_x-emitting vehicles. The proposed program is also expected to result in reductions of 1 to 3 percent in VOC emissions when compared to the 2012 and 2017 No-Build/No-Action Conditions.

Because these differences for both the 2012 and 2017 Build Conditions are well within the CAA *de minimis levels* of 50 tons/year for NO_x and VOCs, the SWSA Redevelopment Program emissions meet the criteria of "Presumed-to-Conform" to the SIP. In other words, since the program is consistent with the goals of the SIP, no further demonstration of this outcome is considered necessary, and mitigation would not be required. The reduction in NO_x emissions is consistent with Massport's goals of the AQI for Logan Airport.

Regional Air Quality Benefits

The mesoscale (or regional) analysis demonstrates that the emissions associated with the SWSA Redevelopment Program are well within the CAA General Conformity Rule *de minimis* levels indicating that they are consistent with the goals for the O_3 SIP. In the Boston area, air quality mitigation measures on the mesoscale level are most effective when they are aimed at regional O_3 precursors of NO_x and VOCs. Therefore, the proposed SWSA Redevelopment Program will further improve air quality through the following beneficial measures:

- Consolidating the rental car shuttle bus fleet would reduce VMT between the ConRAC facility and commercial parking and main terminals reducing terminal curbside congestion and the associated emissions.
- Providing employee and passenger access to mass transit at the MBTA Blue Line Airport Station and the Silver Line stop at Terminal A would provide alternative means of access/egress and reduce VMT and the associated emissions.
- Constructing a dedicated service road and loop at the ConRAC would facilitate efficient pick-up/drop-off to terminals and other ground transportation facilities, and reduces emissions.
- Incorporating pedestrian and bicycle access to the site would reduce VMT and the associated emissions.
- Improving roadways/intersections and traffic signals to primary access/egress routes to the SWSA and elsewhere on-airport would improve traffic flow, reduce stop-and-go driving and reduce excess emissions.
- Requiring Logan Airport Employee Transportation Management Association (TMA) membership by SWSA employees would provide alternative means for accessing the site, and would thus reduce VMT and emissions.

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Microscale Analysis

The microscale analyses for the SWSA Redevelopment Program was conducted using methodologies recommended by the U.S. EPA and DEP and is based on

project-specific development plans and operational data for the program. This analysis predicts "ambient" (i.e., outdoor) levels of air pollutants at the project site, in the adjoining neighborhoods, and adjacent to nearby roadways/intersections. The results (expressed as $\mu g/m^3$) are directly comparable with the AAQS and help to determine the proposed program's potential impact on local air quality conditions.

Microscale Analysis Methodology

Because the SWSA Redevelopment Program involves mobile sources (i.e., motor vehicles, such as rental cars, taxis, shuttle/transit buses, etc.) on-site, elsewhere on-airport as well as off-airport and stationary emission sources (i.e., heating plant and standby emergency generators), the microscale analysis was conducted using two separate modeling methods:

- Atmospheric dispersion modeling for the on-site sources and
- CO "hot-spot" modeling for roadway/intersections.

In this way, program-related emissions from SWSA, on-airport and off-airport sources are included in the analysis.

The atmospheric dispersion modeling was conducted with the EPA AERMOD, Massachusetts-specific MOBILE6.2 motor vehicle emission factors and meteorological data (i.e., wind speed and direction, ambient temperature, etc.) from Logan Airport (see Appendix E). Motor vehicle traffic data for the rental car facility, associated parking and staging areas, and the internal roadway network were obtained from the Traffic Analysis (Chapter 4, *Transportation and Parking*). Emissions from stationary sources were derived from permitted emission levels, annual fuel utilization rates, and/or appropriate vender specifications characteristics (i.e., emission rates) of each source.

Consistent with recommendations contained in the ENF, ambient concentrations of CO and PM were predicted at sensitive receptors (i.e., parks, schools, sporting facilities, residential areas, etc.) located within 0.3 kilometers (0.25 miles or 1,000 feet) of the project site.[14] These receptor locations were obtained from an in-the-field survey and scale-drawings of the SWSA under current and future-year conditions with and without the proposed improvements. For more complete coverage, a grid of 97 receptors spaced approximately 300 feet apart was also included in the dispersion model. As shown in Figures E-1 and E-2 in Appendix E, approximately 150 individual receptors were analyzed.[15]

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14 For PM, both PM_{10} and $PM_{2.5}$ (i.e., particles equal to or less than 10 and 2.5 micron in diameter, respectively,) are analyzed.

15 The receptor elevations were determined based on USGS DEM data. Otherwise receptors were assigned a height of 1.8 meters (typically breathing height) with some receptors placed at higher elevations (such as multistory hotels and apartments). Appendix E provides a listing of the sensitive receptors..

The CO "hot-spot" modeling was conducted using the EPA CAL3QHC model, combined with Massachusetts-specific MOBILE6.2 motor vehicle emission factors. Motor vehicle traffic data from the Traffic Analysis (Chapter 4, *Transportation and Parking*) was used and "worst-case" meteorological data was assumed.[16] The roadways/intersections analyzed are shown in Figure 5.2 and comprise the following:

- Harborside Drive/Porter Street;
- Harborside Drive/Jeffries Street; and
- Harborside Drive/Hotel Drive Extension.

To account for the effects of non-SWSA emission sources (i.e., aircraft, GSE, motor vehicles, and stationary sources operating outside the project site), "background" concentrations were added to the AERMOD/CAL3QHC modeling results. These background levels were obtained from DEP air monitoring stations located nearby.[17]

2007 Existing Condition

The results of the atmospheric dispersion modeling are summarized in Table 5-2 and represent the highest predicted levels of CO and $PM_{10/2.5}$ at all of the receptors analyzed in the vicinity of the SWSA site. For comparative purposes, the AAQS for these pollutants are also shown. The atmospheric dispersion modeling results shown in Table 5-2 for 2007 Existing Condition shows that:

- The highest predicted 1- and 8-hour levels of CO in the vicinity the SWSA are 7,028 and 3,433 $\mu g/m^3$, respectively. These levels are predicted to occur along the western boundary of the garage facility, along Porter Street which is internal to the SWSA.
- The highest predicted 24-hour levels of PM_{10} in the vicinity the SWSA are 52 $\mu g/m^3$. These levels are expected to occur near southeastern sector of the facility, near the Service Area adjacent to the Harborwalk.
- The highest predicted 24-hour and annual average levels of $PM_{2.5}$ in the vicinity the SWSA are 34 and 13 $\mu g/m^3$, respectively. Again, these levels are expected to occur near the southeastern section of the garage.

As required by DEP, the reported values represent the highest predicted levels at all of the receptors analyzed. The highest receptor number is shown in parentheses and, therefore, the values at the other receptors are less by comparison, including those in the adjoining neighborhoods. The layout of the SWSA is different under the 2012 and 2017 No-Build/No-Action Conditions versus the 2012 and 2017 Build Conditions

16 Worst-case meteorological data means low wind speed (< 1meter/second).
17 DEP air monitoring station data obtained from Commonwealth of Massachusetts 2006 Air Quality Report, Massachusetts Department of Environmental Protection, July 2007. These data are contained in Appendix E.

and, therefore, the highest predicted levels do not always occur at the same receptor. All of these predicted values are within the AAQS for these pollutants. Therefore the highest predicted values are not necessarily directly comparable to one another.

Table 5-2
Atmospheric Dispersion Modeling Results ($\mu g/m^3$) [1]
Highest Predicted Values

Pollutant	Time Period	AAQS	2007 Existing	2012 No-Build/ No-Action	2012 Build	2017 No-Build/ No-Action	2017 Build
CO	1-hr.	40,000	7,028 (R21)	7,367 (R18)	8,441 (R26)	7,428 (R21)	8,325 (R26)
	8-hr.	10,000	3,433 (R14)	3,615 (R92)	3,517 (R28)	3,611 (R92)	3,491 (R28)
PM_{10}	24-hr.	150	52 (R8)	52 (R12)	53 (R25)	52 (R12)	52 (R25)
$PM_{2.5}$	24-hr.	35	34 (R8)	34 (R12)	34 (R25)	33 (R12)	34 (R25)
	Annual	15	13 (R8)	13 (R12)	13 (R25)	13 (R12)	13 (R25)

CO Carbon monoxide
PM 10/2.5 Particulate matter equal to, or less than 10 and 2.5 microns in size, respectively.
AAQS Ambient Air Quality Standards, hr. – hour
R(xx) Refers to receptor location
1 As required by DEP, the reported values represent the highest predicted levels at all of the receptors analyzed. The highest receptor is shown in parentheses. Because the layout of the SWSA is different under the 2012 and 2017 No-Build/No-Action and Build Conditions, the highest predicted levels do not always occur at the same receptor. The results for each receptor are provided in Appendix E. Figure E-1 and E-2 display the receptor locations and Table E describes the receptor locations.

The results of the CO "hot-spot" modeling analysis represent the highest predicted levels of CO at all of the intersections and receptors analyzed (Table 5-3).[18] Again, appropriate "background" levels were added to the AAQS for these pollutants.

Table 5-3
CO "Hot-Spot" Modeling Results ($\mu g/m^3$)[1]

Pollutant	Time Period	NAAQS	2007 Existing	2012 No-Build/ No-Action	2012 Build	2017 No-Build/ No-Action	2017 Build
CO	1-hr.	40,000	6,900	6,200	5,900	6,100	5,600
	8-hr.	10,000	4,100	3,700	3,500	3,700	3,400

CO carbon monoxide,
AAQS Ambient Air Quality Standards, hr. - hour
1 The reported values represent the highest predicted levels at all of the intersections and receptors analyzed.
The results for each intersection and receptor sets are provided in Appendix E.

Based on the CO "hot-spot" modeling results for the 2007 Existing Condition, the highest-predicted 1- and 8-hour CO levels adjacent to the intersections are 6,900 and 4,100 $\mu g/m^3$, respectively (Table 5-3). These levels are expected to occur near the Harborside Drive/Jeffries Street intersection and are also well within the AAQS for this pollutant.

18 Appendix E contains the results for all of the intersections and receptors analyzed for the CO "hot-spot" analysis.

Future Conditions

The outcomes of the future-year atmospheric dispersion and CO "hot-spot" analyses for the SWSA Redevelopment Program are summarized and discussed in this section for both the 2012 and 2017 No-Build/No-Action and Build Conditions.

Future No Build /No-Action Conditions

Based on the atmospheric dispersion modeling results shown in Table 5-2 for the future-year conditions without the SWSA Redevelopment Program (i.e., No-Build/No-Action Condition), the following summary findings are reported:

- The highest predicted 1- and 8-hour levels of CO in the vicinity the SWSA would be 7,367 and 3,615 $\mu g/m^3$ in 2012 and 7,428 and 3,611 $\mu g/m^3$ in 2017, respectively. As under the 2007 Existing Condition, these levels are predicted to occur along the western boundary of the ConRAC facility, on-airport along Porter Street and internal to the SWSA.
- The highest predicted 24-hour levels of PM_{10} in the vicinity the SWSA are 52 $\mu g/m^3$ in 2012 and 52 $\mu g/m^3$ in 2017, respectively. These levels are expected to occur in the vicinity of Maverick and Jeffries Streets intersection, near the southeast sector of the SWSA.
- The highest predicted 24-hour and annual average levels of $PM_{2.5}$ in the vicinity the SWSA would be 34 and 13 $\mu g/m^3$ in 2012 and 33 and 13 $\mu g/m^3$ in 2017, respectively. Again, these levels are expected to occur in the vicinity of Maverick and Jeffries Streets intersection, near the southeast section of the SWSA.

These values are the highest predicted levels at all of the receptors analyzed and, therefore, the values of the other receptors are less, by comparison, including those in the adjoining neighborhoods. All of these highest-predicted values are within the AAQS for these pollutants.

Based on the CO "hot-spot" modeling results shown in Table 5-3, the highest predicted 1- and 8-hour CO levels adjacent to the roadway/intersections range from 6,200 to 3,700 $\mu g/m^3$, respectively, under the future-year (i.e., 2012 and 2017) No-Build/No-Action Conditions. These levels are expected to occur near the Harborside Drive/Jeffries Street intersection. Again, all of these highest-predicted values are well within the AAQS for CO.

Future Build Conditions

Based on the atmospheric dispersion modeling results shown in Table 5-2 for the future-year conditions with the SWSA Redevelopment Program, the following summary findings are reported:

- The highest predicted 1- and 8-hour levels of CO in the vicinity the SWSA would be 8,441 and 3,517 $\mu g/m^3$ in 2012 and 8,325 and 3,491 $\mu g/m^3$ in 2017, respectively. These levels are expected to occur immediately north of the ConRAC facility.

- The highest predicted[d] 24-hour levels of PM_{10} in the vicinity the SWSA would be 53 $\mu g/m^3$ in 2012 and 52 $\mu g/m^3$ in 2017, respectively. These levels are expected to occur near the SWSA ConRAC Customer Service Area.

- The highest predicted 24-hour and annual average levels of $PM_{2.5}$ in the vicinity the SWSA would be 34 and 34 $\mu g/m^3$ in 2012 and 13 and 13 $\mu g/m^3$ in 2017, respectively. These levels are also expected to occur near the SWSA ConRAC Customer Service Area.

As previously reported for the 2007 Existing Condition and 2012 and 2017 No-Build/No-Action Conditions, these values are the highest predicted levels at all of the receptors analyzed and, therefore, the values at the other receptors are less, by comparison, including those in the adjoining neighborhoods. Even under the 2012 and 2017 Build Conditions, all of these predicted values are within the AAQS for these pollutants.

Based on the CO "hot-spot" modeling results shown in Table 5-3, the highest-predicted 1- and 8-hour CO levels adjacent to the roadway/intersections range from 5,900 to 3,500 $\mu g/m^3$, respectively, under the 2012 and 2017 Build Conditions. These levels are expected to occur near the Harborside Drive/Porter Street intersection. Again, all of these highest-predicted values are well within the AAQS for CO.

Beneficial Microscale Air Quality Measures

Air quality measures that are most beneficial on the microscale level are most effective when they are aimed at improving traffic flow and reducing stop-and-go driving, both on and off the SWSA. Even though the microscale and CO "hot-spot" analyses do not show any exceedances of the AAQS for CO and $PM_{10/2.5}$ the following design and operational features of the SWSA Redevelopment Program are predicted to help to reduce these local impacts on air quality when compared to the 2012 and 2017 No-Build/No-Action Conditions:

- Common shuttle bus fleet reduces VMT between the ConRAC and main terminals and helps reduce terminal curbside congestion and the associated emissions.

- Improved employee and patron access to mass transit at the MBTA Blue Line Airport Station and the Silver Line stop at Terminal A enhances alternative means of access/egress, reduces VMT and the associated emissions.

- Dedicated service road and loop at the ConRAC for efficient pick-up/drop-off to terminals and other ground transportation facilities reduce emissions.

- "Smart Garage" features and technology including "pay-on-foot" and space availability notification systems to help reduce idling and associated emissions.

- Rental car storage areas and commercial parking facilities have separate entrances/exits, reducing "roaming" VMT and associated emissions.
- Provisions for pedestrian and bicycle access to the site reduces VMT and the associated emissions.
- Roadway/intersection improvements and traffic signal upgrades to primary access/egress routes to the SWSA and elsewhere on-airport would improve traffic flow, reduce stop-and-go driving and reduce excess emissions.
- Logan Airport Employee Transportation Management Association (TMA) membership by SWSA employees promotes alternative means for accessing the SWSA and reduces VMT and emissions.

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Greenhouse Gas (GHG) Emissions Analysis

Mounting scientific evidence now strongly suggests that there is a connection between climate change (or global warming) and emissions of GHG worldwide. These GHG are comprised primarily of carbon dioxide (CO_2) but also include methane (CH_4), nitrous oxides (N_2O), and three groups of fluorinated gases.[19] Therefore, the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) has developed the *MEPA Greenhouse Gas Emissions Policy and Protocol* for preparing GHG emissions analyses for new development projects and identifies potential GHG mitigation measures.[20]

In support of this new MEPA GHG initiative, an emission inventory of both "direct" and "indirect" sources of GHG emissions associated with SWSA Redevelopment Program has been prepared and is contained in this section.[21] (A GHG inventory for the entire airport is published separately and will be included in the *Logan Airport 2007 EDR*) to be filed in fall 2008.

GHG Emissions Analysis Methodology

For this analysis, GHG emissions are quantified in much the same fashion as the mesoscale analysis described previously. In this way, the analysis accounts for GHG associated with motor vehicles (i.e., cars, trucks, vans, buses, rental cars, etc.) traveling to, from and moving about the SWSA site and also includes GHG emissions attributable to on-site stationary sources (i.e., emergency back-up generators).

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19 These gases include sulfur hexafluoride (SF6), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs).
20 *MEPA Greenhouse Gas Emissions Policy and Protocol*, dated July 25, 2007, www.mass.gov/envir/mepa/pdffiles/misc/ghgemissionspolicy.pdf
21 "Direct" emissions are those that occur in connection with the SWSA Redevelopment Program (i.e., motor vehicles traveling on "on-airport" roadways, within the SWSA parking lots and facilities, and the North Service Area) and "indirect" emissions are those that are associated with the program, but occur elsewhere (i.e., electricity generated at off-airport power plants).

Following standard GHG analysis conventions, the contributions from electrical usage at the SWSA are also included.[22]

Again, the data for this analysis (i.e., motor vehicle fleet mix, fuel usage, VMT, electrical consumption, etc.) were obtained from planning studies and design documents developed in support of the SWSA Redevelopment Program. Appropriate GHG emission factors were obtained from the U.S. EPA and Intergovernmental Panel on Climate Change (IPCC) and are listed in Appendix E.[23]

Existing GHG Emissions Conditions

As shown in Table 5-4, total CO_{2e} emissions associated with the SWSA under the 2007 Existing Condition are estimated to be 14,841 MT CO_{2e} /year. These results provide a basis of comparison for the change in future-year CO_{2e} emissions attributable to the program.

For consistency and ease of comparison, the results are converted to CO_2 equivalent values (CO_{2e}) using the Global Warming Potential values, compiled as an emissions inventory in Table 5-4, and reported in units of annual metric tons/year.[24] Chart 5-2 below illustrates the findings of the GHG analysis.

Table 5-4
GHG Analysis Results (MT CO_{2e})[1]

	2007 Existing Condition	2012 Future No-Build/ No-Action	2012 Future Build (Phase I)	2017 Future No-Build /No-Action	2017 Future Build (Phase II/Full Build)
GHG Emissions (tons per year)[2]	14,841	14,437	11,927	15,110	12,836

1 Metric Tons / Year as CO_2 equivalent values (MT CO_{2e})

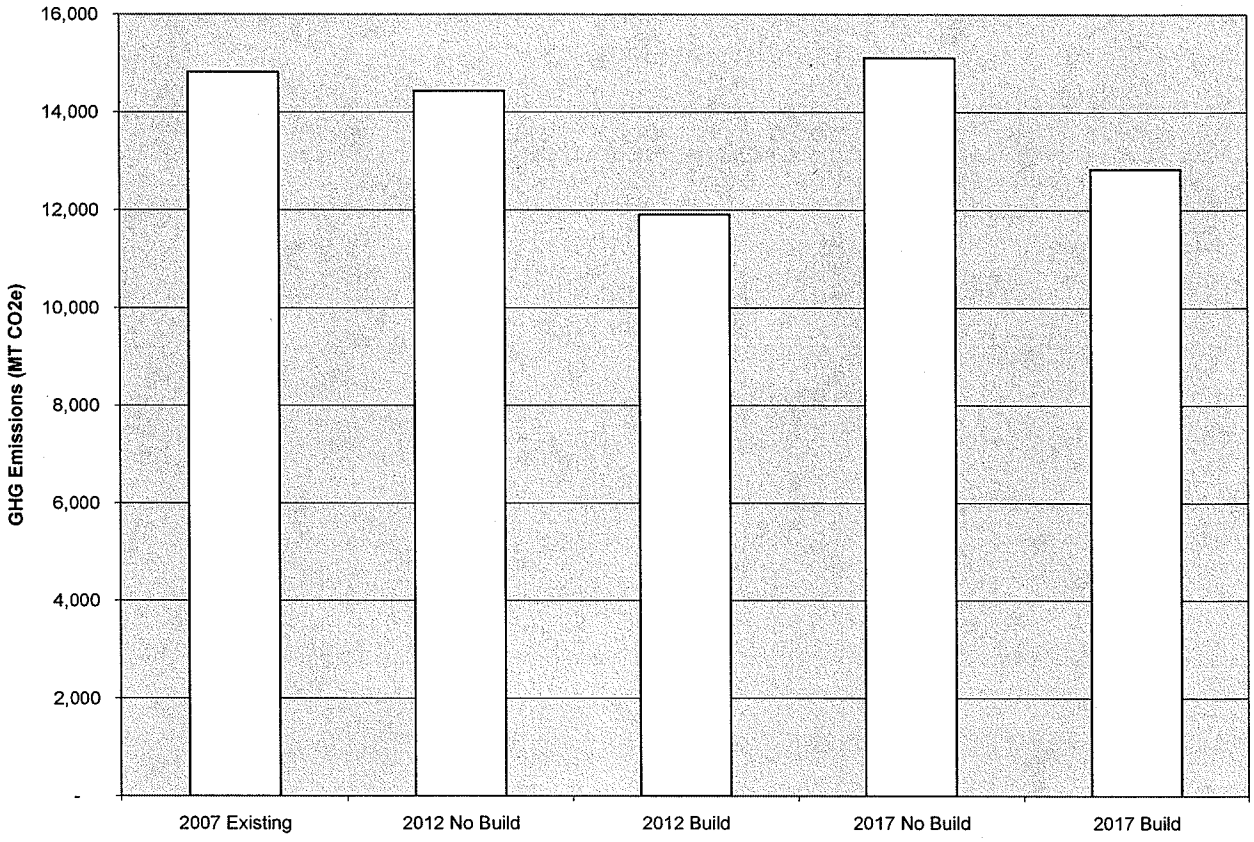
2 Total Emissions = Direct Emissions + Indirect Emissions Direct Emissions are generated from the SWSA activities and Massport-owned sources of GHG (i.e., motor vehicles, emergency generators, etc.) Indirect Emissions are associated with the SWSA, but are generated elsewhere on-airport or off-airport (i.e., electric power, motor vehicle trips).

22 The SWSA Redevelopment Program is not expected to have any effect on aircraft, GSE/APU, snowmelters or fire training emissions. GHG emissions from these sources will also be addressed in the *2007 Environmental Data Report* (EDR) for Logan Airport.

23 Emission factors are based on data contained in the US EPA emissions models MOBILE6.2 and NONROAD and for stationary sources from Volume 2 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

24 The CO_2 equivalent values are 1 for CO_2, 23 for CH_4, and 296 for N_2O (based on a 100 year period) as presented in the *Intergovernmental Panel on Climate Change (IPCC)'s Third Assessment Report.*

Chart 5-2
GHG Analysis Results (MT CO_{2e})



Future GHG Emissions Conditions

Future-year GHG emissions associated with the SWSA are summarized and discussed in this section for both the 2012 and 2017 No-Build/No-Action and Build Conditions.

Future No-Build/No-Action Conditions

By 2012, total CO_{2e} emissions associated with the SWSA are expected to be 14,437 metric tons (MT) MT CO_{2e} /year without the proposed SWSA Redevelopment Program (No-Build/No-Action Condition). By 2017, under this same condition, this value is expected to increase to 15,110 MT CO_{2e} /year. This predicted increase over the 2007 Existing Condition is mostly attributable to the forecasted increase in VMT (and the associated fuel use) by motor vehicles traveling to and from the facility and moving about the internal roadway network, parking lots, and vehicle staging areas.

Future Build Conditions

Based on an estimate of electricity consumption associated with the proposed program, under the 2012 and 2017 Build Conditions, CO_{2e} emissions associated with the SWSA would be 11,927 MT CO_{2e} /year by 2012 and 12,836 MT CO_{2e} /year by 2017. These values represent a 17 percent and 15 percent decrease in SWSA-related CO_{2e} emissions when compared to the corresponding 2012 and 2017 No-Build/No-Action Conditions, respectively. This predicted change is attributable to the forecasted decrease in VMT (and the associated fuel use) by motor vehicles using the facility and the small predicted increase in electrical usage, heating and cooling, and backup generator use compared to the 2012 and 2017 No-Build/No-Action Conditions.

In addition, consistent with the goals of Executive Orders 484 and 385, and Massport's sustainability policy, the SWSA Redevelopment Program will be designed, constructed and operated to be eligible for LEED certification (Massport will strive to achieve a LEED Silver rating and meet the requirements of the MA LEED Plus program). A key component of the GHG analysis is energy consumption. A new prerequisite for LEED certification (as of June 26, 2007) is the reduction of energy consumption over a standard design by up to 14 percent, or two LEED points under the Optimize Energy Performance credit. Additionally, the MA LEED Plus program expands its requirements to achieve a minimum of 20 percent energy efficiency over the baseline. The Future Build Conditions assume meeting both of these requirements as described below.

In an effort to minimize the GHG emissions resulting from the proposed program as it is designed and analyzed herein (the 2012 and 2017 Build Conditions), Massport is considering several physical and operational improvements that would meet this 20 percent prerequisite. Consideration is being given to the use of renewable energy sources (wind and solar) and equipment and design efficiencies. The following GHG emission reduction features could be included in the proposed Program, and their benefit is calculated below. In compliance with the Policy, these and other measures have been evaluated in terms of their applicability and effectiveness with the SWSA Redevelopment Program:

- Similar to the micro wind turbines that were recently installed on Massport's Logan Office Center, microturbine units could be installed as a pilot program on the top level of the west-northwest face of the garage facility. Based on manufacturers' specifications, these units would produce an estimated annual output of 500,000 kWh, which would be directly used by the facility.
- Solar or photovoltaic panels could be installed on the roof of the CSC. These panels could cover just under 25,000 square feet, and would provide an estimated 375,000 kilowatt-hours for a year representing an approximately 2.5 percent of estimated annual consumption of 15 million kWh for the unimproved building described above.

- In addition, it is assumed that in the building envelope (e.g., glazing, roofing), HVAC (e.g., refrigerants, system types), and lighting (e.g., motion sensors) efficiencies would meet the requirements of the MA LEED Plus program and would result in further reductions in GHG impacts.

These measures and other measures for reducing greenhouse gas emissions could result in a reduction annually of approximately 760 MT CO_{2e} due to reduced electrical consumption as a consequence of the proposed program design.[25] As design proceeds, measures to achieve LEED certification (striving to meet the requirements of the MA LEED Plus program and reach a LEED Silver level rating) will be further defined. By utilizing the LEED checklist and green building rating system as verification, Massport will better ensure an energy-efficient building resulting in lower amount of greenhouse gas emissions from both mobile and stationary sources of the proposed program elements. Other beneficial design measures and building systems specifications that could be considered to meet LEED certification as they relate to energy efficiency include:

Architectural Design/Treatments

- Provide an open garage design for natural ventilation and to reduce the need for energy-consuming ventilation, or HVAC, systems.
- Use highly-reflective (high-albedo) roofing materials
- Maximize interior natural daylighting through clearstory windows and/or sky lights.
- Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance in all enclosed spaces (i.e., CSC, Quick Turn Around Areas).

Efficient Equipment and Building Systems

Assuming the SWSA Redevelopment Program will meet the MA LEED Plus requirement of 20 percent energy cost savings, a conservative claim of a 15 percent reduction in consumption site-wide would be reasonable (2.25 million kWh per year). This would likely result from an aggregate of HVAC, lighting, and building envelope efficiencies. A larger portion of savings could be realized via the ventilation, or HVAC, systems in both QTAs and the CSC. The following scenarios of lower to higher efficiency HVAC systems are being evaluated:

- QTAs: gas-fired heaters and packaged rooftop units versus gas-fired boiler, fan-coil units, and hydronic heating terminal units;

25 This reduction in GHG emissions of 760 MT CO2e is attributable to reductions in energy utilization.

- CSC: rooftop packaged DX VAV system versus VAV air-handling units and water cooled chillers;
- Eliminating or reducing use of refrigerants in HVAC systems;
- Incorporating motion sensors and lighting and climate control in all public areas;
- Using efficient, directed exterior lighting;
- Installing water-efficient plumbing fixtures; and
- Utilizing renewable energy sources, including wind and/or solar:
  - Installing microturbine units (similar to those in operation on the Logan Office Center). Based on the success of these units to supplement the building's energy demand, Massport will evaluate utilizing similar units on the garage structure; and
  - Evaluating solar panels as the design of the garage structure progresses.

Pedestrian Wind Analysis

The MEPA ENF Certificate called for a wind analysis as a means of evaluating the potential effects of the SWSA Program on pedestrian-level winds as they relate to air quality conditions in the vicinity of the facility. The findings from this assessment are contained in Appendix E and are summarized in this section.

Wind Analysis Methodology

According to the MEPA Certificate, the wind study was required to include areas near the project, including the entrances to the project site and any other nearby areas where pedestrians are expected to congregate. The wind analysis was also required to study impacts on public and private open spaces in the project area, and the nearest residential streets to the project.

Wind conditions in the vicinity of the proposed project were assessed at a screening level analysis using a computer model "*Windestimator*"[26,27] developed by RWDI based on the professional experience of its researchers with other similar developments. Inputs to the analysis include local wind and climate data taken at Logan Airport and scaled design drawings of the parking garage and adjoining structures. The model estimates wind flow around building forms and reports the results in terms of pedestrian wind comfort criteria (i.e., standing, walking, etc. under different seasonal conditions).

26 H. Wu., C.J. Williams, H.A. Baker and W.F. Waechter (2004). "Knowledge-based Desk-Top Analysis of Pedestrian Wind Conditions". ASCE Structure Congress 2004. Nashville, Tennessee.

27 C.J. Williams, H.Wu., W.F. Waechter and H.A. Baker (1999). "Experience with Remedial Solutions to Control Pedestrian Wind Problems". 10th International Conference on Wind Engineering. Copenhagen, Denmark.

■

2007 Existing Condition and Future No-Build/No-Action Conditions

Existing and 2012 and 2017 No-Build/No-Action wind conditions around the SWSA are expected to be suitable for standing or walking (less than 19 mph) throughout the year, with potentially uncomfortable wind conditions (greater than 19 mph) in the winter towards the east end of the SWSA, which will be more exposed to the prevailing northwesterly and northeasterly winds.

■

Future Build Conditions

The results of the wind analysis show that pedestrian winds are predicted to be appropriate for pedestrians in general in all areas around the SWSA Redevelopment Program. Areas most likely to be frequented by pedestrians, including the entrance to the Customer Service Center and Tomahawk Drive sidewalk, would not be adversely affected; nor would the Haborwalk to the south of the site be impacted by the proposed program. Memorial Stadium Park and associated recreational facilities to the north will be protected by the proposed landscaping in the summer and fall seasons, and would not be affected by the proposed parking structure or ancillary facilities.

■

Wind Beneficial Measures

Pedestrian winds are predicted to be appropriate for pedestrians in general in all areas around the SWSA Redevelopment Program. There may be uncomfortable winds during the winter and spring seasons at the exposed corners of the proposed garage structure, primarily under high wind conditions, however, the potential effects of the planned buildings on high wind conditions would be minimized by the planting of landscaping in these areas. Moreover, there are no pedestrian walkways or congregating areas at these locations.

Conclusion

This chapter presented the results of the air quality impact assessment conducted for the SWSA Program. The assessment consisted of four individual analyses, summarized below. Refer to Chapter 10, *Construction* for the results of the air quality analysis on temporary construction activities. Information pertaining to the *Logan Airport Parking Freeze* and the *East Boston Parking Freeze* as well as off-airport rental car parking is presented in Chapter 4, *Transportation and Parking.*

Regional Analysis

- Future-year emissions of NO_x and VOCs (the two primary precursors to O3-formation) associated with the SWSA Program are well within the federal CAA General Conformity *de minimis* levels. Therefore, the project is automatically "Presumed-to-Conform" to the SIP and a formal conformity determination is not needed.
- Total emissions of NO_x and VOC are predicted to decrease in the future with the SWSA Program when compared to 2007 Existing Condition and 2012 and 2017 No-Build/No-Action Conditions. This is largely a result of the forecasted decrease in VMT and the associated motor vehicle emissions.
- SWSA-related emissions of NO_x represent less than two percent of the Logan Airport AQI 1999 threshold and are not expected to cause the threshold to be exceeded.

Microscale Analysis

- Based upon atmospheric dispersion modeling, CO and $PM_{10/2.5}$ concentrations in the vicinity of the SWSA (including the neighborhoods of East Boston and Jeffries Point) are expected to remain below the AAQS for these pollutants.
- Based upon the CO "hot-spot" modeling, the highest predicted levels of this pollutant in the vicinity of nearby roadway intersections are also expected to remain well below the AAQS for this pollutant.

Greenhouse Gas (GHG)

- The air quality study demonstrates that the SWSA Redevelopment Program complies with the Executive Office of Energy and Environmental Affairs (EEA) policy on Greenhouse Gas emissions. The GHG emissions analysis demonstrates that the proposed program meets the EEA policy on GHG emissions because it has evaluated potential Project-related impacts associated with GHG emissions and includes mobile and stationary source measures that will reduce the CO_2 emissions.
- GHG emissions associated with the SWSA Redevelopment Program are predicted to decrease when compared to the 2012 and 2017 No-Build/No-Action Conditions. This decrease is mostly attributable to the forecasted decrease in VMT in vehicles associated with the facility.

Wind Analysis

- The proposed garage structure is not expected to have any significant effect on pedestrian-level winds on or near the SWSA or in the adjoining neighborhoods.
- The only predicted exception to this is near the corners of the buildings under high wind speed conditions.
- Planned mitigation measures, in the form of dense landscaping in these areas will help minimize these potential effects.

No agency comments on GHG

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February 29, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Simpson Parcel 1
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 14153
PROJECT PROPONENT	: SHLP-Bulfinch LLC
DATE NOTICED IN MONITOR	: December 24, 2007

Pursuant to the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and Section 11.11 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Expanded Environmental Notification Form (EENF) for this project and hereby determine that it **does not require** further MEPA review. In a separate Draft Record of Decision (DROD) also issued today, I have proposed to grant a Waiver from the requirement to prepare a Mandatory Environmental Impact Report (EIR).

Project Description

As described in the Expanded Environmental Notification Form (EENF), the proposed project consists of the design and construction of a 361,450 gross square foot (sf) mixed-use development on a 45,394 sf parcel in the Bulfinch Triangle. The parcel is owned by the Massachusetts Turnpike Authority (MTA). The proponent was designated as the developer of this parcel by the MTA following a public Request for Proposal process that included public presentations and meetings. The proponent will lease the property from MTA through a ground lease. The project will include approximately 14,910 sf of retail space on the ground floor (including 11,940 sf of restaurant space), a 142-space parking garage on the second, third and fourth floors and 283 residential units on the remaining floors.

The site is bounded by Haverhill Street, Causeway Street, Beverly Street and Valenti Way. The site consists primarily of impervious surfaces. It is located above the Massachusetts Bay Transportation Authority (MBTA) Green and Orange Line Stations and directly across from the commuter rail at North Station. The site includes utility corridors, emergency tunnel access, MBTA station access and MBTA air shafts. It is located on landlocked tidelands approximately 475 feet from the shoreline of Boston Inner Harbor and within the City of Boston Groundwater Conservation Overlay District. The parcel was created through the Central Artery/Tunnel (CA/T) project and is owned by the MTA.

Permitting/Jurisdiction

The project is undergoing MEPA review and subject to preparation of mandatory Environmental Impact Report (EIR) pursuant to Section 11.03 (6)(a)(6) because it requires a state permit and will generate 3,000 or more new average daily vehicle trips (adt). The project requires a Sewer Connection Permit from the Department of Environmental Protection (MassDEP) and a ground lease from the MTA.

The project is subject to Article 80 Large Project Review by the Boston Redevelopment Authority (BRA) which was completed prior to filing of the EENF Certificate. In addition, it requires the development of a Transportation Access Plan Agreement (TAPA) and Construction Management Plan (CMP) for review by the Boston Transportation Department (BTD), a Curb Cut Permit from the Boston Public Works Department (PWD) and Boston Parks and Recreation Commission approval for construction of a building within 100 feet of a park.

Potential Environmental Impacts

Potential environmental impacts are associated with the generation of approximately 3,054 average daily vehicle trips (adt) based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, use of 63,860 gallons per day (gpd) of water, generation of 58,000 gpd of wastewater and use of landlocked tidelands. Re-development of this site that is located in close proximity to transit will minimize overall impacts. The ENF indicates that measures to avoid, minimize and mitigate environmental impacts include: incorporation of sustainable design elements as required by Article 37 of the Boston Zoning Code; development of a Transportation Demand Management (TDM) program and a limited parking supply to minimize traffic trips; and support for streetscape improvements including a $300,000 contribution to the City of Boston Crossroads Initiative.

Because the proponent is seeking a land transfer, in the form of a ground lease, MEPA jurisdiction extends to those aspects of the project within the area subject to the land transfer that are likely, directly or indirectly, to cause Damage to the Environment. Pursuant to 301 CMR 11.01(2)(a)(3), MEPA subject matter jurisdiction is functionally equivalent to full scope jurisdiction.

Waiver Request

The proponent has requested a Waiver of the requirement to prepare an EIR. An EENF was submitted in conjunction with this request and it was subject to an extended comment period as required.

Review of the EENF

The EENF provides a detailed project description and plans that provide a clear understanding of the proposed project within its context. The EENF identifies the potential environmental impacts of the project and describes measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts. The EENF includes a traffic study and additional information regarding impacts to historic resources. Supplemental information, submitted on February 27, 2008 provides additional information regarding the project's consistency with the Commonwealth's Sustainable Development Principles and efforts to minimize greenhouse gases associated with the project design and long-term operation.

The EENF and comments from Downtown North Association (DNA) identify the extensive amount of land use, urban design and transportation studies conducted within the Bulfinch Triangle over the past decade. The North Area Planning Initiative and the Bulfinch Triangle Design and Development Guidelines emerged from these studies and articulate a comprehensive vision for urban design and development. Comments from DNA indicate that the project has involved substantive and continuing community participation, through the Bulfinch Triangle Community Advisory Committee (BTCAC), in the developer selection and ongoing permitting processes that were based on those guidelines.

Transportation

As noted previously, trip generation is estimated at over 3,000 adt based on the ITE Trip Generation Manual. According to the EENF, use of the BTD mode shares to adjust this estimate results in an estimate of 702 adt. This estimate is significantly lower than the mandatory EIR threshold of 3,000 adt and also below the ENF threshold of 2,000 adt.

The EENF describes measures to reduce transportation related impacts and identifies a TDM Program to minimize trips. The TDM Program includes limited parking, designating a transportation coordinator, providing orientation packets to residents regarding transit options, and bicycle racks that can store more than 90 bicycles. The EENF indicates that the parking ratio associated with the project is .5 spaces per unit. Also, the project may include a partnership with a car sharing service. These efforts will leverage the range of transportation resources available in the district and the relatively low parking ratio increases the likelihood that residents will use transit.

In addition, the project will contribute $300.000, or perform a comparable amount of work, to the Boston Crossroads Initiative. This City initiative was developed to redesign and revitalize the roads that cross the Rose Fitzgerald Kennedy Greenway and connect people to

neighborhoods and destinations on either side. These funds will be targeted towards improvements to Causeway Street that will extend from Lomansey Way/Merrimack Street to Prince Street. Also, the project will contribute $12,000 to the Bulfinch Triangle Streetscape Improvements Initiative.

Historic and Cultural Resources

As part of the environmental planning and "joint development" process of the CA/T Project, the MHC, as State Historic Preservation Officer, must review and approve the design of development parcels in compliance with the Central Artery Memorandum of Agreement (MOA), pursuant to Section 106 of the National Historic Preservation Act (36 CFR 800). Under the terms of the Section 106 MOA, the MHC, in consultation with the Boston Landmarks Commission (BLC), must review and approve the new design of any new construction on any of the air rights parcels to ensure they meet established guidelines that include height limits, design issues, massing, materials, siting and setback requirements.

Comments received from MHC and the Boston Environment Department (BED) indicate that the proposed building will exceed height limits developed to protect historic resources. MHC indicates that the height is acceptable given the site constraints (for access to utilities and to the tunnels) and the fact that the massing of the building components step back from the Bulfinch Triangle Historic District. Comments from BED indicate that the BLC shares the viewpoint of MHC that the overall scale and massing minimize the impact and the architectural design is sympathetic to the neighborhood context. As requested by MHC, the proponent will be required to provide more detailed design documents to MHC as a condition of the Draft Record of Decision.

Greenhouse Gas Emissions

This project is not subject to the EEA Greenhouse Gas Emissions Policy and Protocol.[1] However, to support its request for a Waiver, the proponent has identified measures to avoid, minimize and mitigate greenhouse gas emissions associated with the building design and its long-term operation.

The project will comply with Article 37 of the Boston Zoning Code by constructing a LEED Certifiable building. In addition, the EENF indicates that the project will be designed to meet or exceed the Energy Star Homes program standards for energy efficiency. The Energy Star Homes program generally improves on energy efficiency of building code by approximately 15%. Sustainable design elements include the redevelopment of an existing site in close proximity to transit, a low parking ratio, a TDM program including transit subsidies and bike storage, incorporation of a green roof or use of cool roofing materials, re-use of stormwater for

[1] Projects are subject to the Policy if an EIR is required and the project falls into one of four categories, the first and second of which being that the Commonwealth or a state agency is either the proponent or is providing financial assistance. EEA's intent is to require analysis of greenhouse gas emissions in those instances where MEPA has full scope jurisdiction (or, as here, the functional equivalent of full scope jurisdiction). EEA will publish a clarification of the applicability of the Policy in a forthcoming Environmental Monitor. This project is not subject to the Policy.

irrigation, water conservation and building commissioning. In addition, it may include the purchase of renewable energy credits, low emitting materials and enhanced daylighting.

MassDEP comments note that the proponent has agreed to incorporate construction and demolition debris (C&D) recycling activities into the project. These comments encourage the proponent to incorporate recycling and source reduction into the building design to support long-term recycling and source reduction efforts.

Wastewater

The project will generate approximately 58,000 gpd of wastewater. Comments from the Massachusetts Water Resources Authority (MWRA) and MassDEP note that the proponent should participate in efforts to remove extraneous clean water (Infiltration/Inflow (I/I)) from the sewer system on a 4:1 basis for a total of 232,000 gpd. The Draft Record of Decision (DROD) includes a condition that the proponent commit to offset I/I on a 4:1 basis. These comments also indicate that the proponent should consult with the Boston Water and Sewer Commission (BWSC) and the MWRA to ensure the project complements the Bulfinch Triangle Sewer Separation project.

Landlocked Tidelands

The project is proposed on landlocked tidelands and subject to the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168). Consistent with Section 8 of this legislation, I must conduct a Public Benefits Review as part of the EIR review of projects located on landlocked tidelands that entail new use or modification of an existing use and I must make a Public Benefits Determination in the Certificate on the Final EIR. Because the proponent has requested a Waiver of the requirement to prepare an EIR, I will refrain from issuing a Public Benefits Determination until reviewing comments on the DROD.[2]

Section 3 of this legislation requires that any project that is subject to MEPA review and proposes a new use or structure or modification of an existing use or structure within landlocked tidelands address the project's impacts on tidelands and groundwater within the ENF. It indicates that the ENF *"shall include an explanation of the project's impact on the public's right to access, use and enjoy tidelands that are protected by chapter 91, and identify measures to avoid, minimize or mitigate any adverse impacts on such rights set forth herein."* If a project is located in an area where low groundwater levels have been identified by a municipality or by a state or federal agency as a threat to building foundations, the ENF *"shall also include an explanation of the project's impacts on groundwater levels, and identification and commitment to taking measures to avoid, minimize, or mitigate any adverse impacts on groundwater levels."* The legislation notes that these provisions also apply to the filing of an EIR if an EIR is required.

[2] I have convened a Technical Advisory Committee (TAC) to assist me in developing a formalized process by which to implement those aspects of the statute that direct the involvement of EEA and the MEPA Office. In the interim, the approach to the Public Benefits Determination reflected in this document should be considered provisional.

The EENF submitted on this project addresses the project's impacts on the public's right to use landlocked tidelands and on groundwater levels. It notes that the project consists of redevelopment of an existing vacant parcel in an area of the City targeted for growth and revitalization. The site consists of impervious surfaces, utilities and access to transportation infrastructure. The landlocked parcel is located approximately 475 feet from Boston Inner Harbor on the landward side of Commercial Street in a mixed use area that includes entertainment, retail and residential uses. The project will not interfere with access to the waterfront or to open space. The project will provide adequate pedestrian access around and through the site and will improve access to the Charles River and Boston Harbor through investment in the Boston Crossroads Initiative. The building will include active ground-level uses including retail and restaurant uses which will be open to the public.

The EENF indicates that the project is located within the City of Boston Groundwater Overlay District. It indicates that, because it consists of construction over transit and highway tunnels, its impact on groundwater will be minimal. Pursuant to Article 32, Section 6 of the Boston Zoning Code, the proponent will certify that the project will not negatively impact groundwater levels on the site or on adjacent lots. Comments from the Boston Groundwater Trust provided to the BRA (dated December 3, 2007) do not identify any significant concerns with impact of the project on groundwater levels or request monitoring of groundwater levels at the site.

Conclusion

Based on a review of the information provided by the Proponent and after consultation with the relevant public agencies, I find that the potential impacts of this project do not warrant further MEPA review. Outstanding issues may be addressed during the permitting process.

I have also issued a Draft Record of Decision (DROD) today proposing to grant a Waiver from the requirement to prepare an EIR for the project. The DROD will be will be published in the next edition of the Environmental Monitor on March 12, 2008 in accordance with 301 CMR 11.15(2), which begins the public comment period. The public comment period lasts for 14 days and will end on March 26, 2008. Based on written comments received on the DROD, I shall issue a Final Record of Decision or a Scope within seven days after the close of the public comment period, in accordance with 301 CMR 11.15(6).

February 29, 2008
Date

Ian A. Bowles

Comments received:

1/23/08	Department of Environmental Protection/Northeast Regional Office (MassDEP NERO)
1/16/08	Massachusetts Historical Commission (MHC)
2/21/08	Massachusetts Historical Commission (MHC) (second letter)
1/23/08	Massachusetts Water Resources Authority (MWRA)
1/23/08	City of Boston Environment Department
2/19/08	Downtown North Association

IAB/CDB/cdb

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February 29, 2008

DRAFT RECORD OF DECISION

PROJECT NAME	: Simpson Parcel 1
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 14153
PROJECT PROPONENT	: SHLP-Bulfinch LLC
DATE NOTICED IN MONITOR	: December 24, 2008

Pursuant to the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and Section 11.11 of the MEPA Regulations (301 CMR 11.00), I have reviewed this project and hereby **propose to grant a waiver** from the categorical requirement to prepare an Environmental Impact Report (EIR). In a separate Certificate also issued today, I have set forth the outstanding issues related to the project that can be addressed by permitting agencies.

Project Description

As described in the Expanded Environmental Notification Form (EENF), the proposed project consists of the design and construction of a 361,450 gross square foot (sf) mixed-use development on a 45,394 sf parcel in the Bulfinch Triangle. The parcel is owned by the Massachusetts Turnpike Authority (MTA). The proponent was designated as the developer of this parcel by the MTA following a public Request for Proposal process that included public presentations and meetings. The proponent will lease the property from MTA through a ground lease. The project will include approximately 14,910 sf of retail space on the ground floor (including 11,940 sf of restaurant space), a 142-space parking garage on the second, third and fourth floors and 283 residential units on the remaining floors.

The site is bounded by Haverhill Street, Causeway Street, Beverly Street and Valenti Way. The site consists primarily of impervious surfaces. It is located above the Massachusetts Bay Transportation Authority (MBTA) Green and Orange Line Stations and directly across from the commuter rail at North Station. The site includes utility corridors, emergency tunnel access, MBTA station access and MBTA air shafts. It is located on landlocked tidelands approximately 475 feet from the shoreline of Boston Inner Harbor and within the City of Boston Groundwater Conservation Overlay District. The parcel was created through the Central Artery/Tunnel (CA/T) project and is owned by the MTA.

Jurisdiction

The project is undergoing MEPA review and subject to preparation of mandatory Environmental Impact Report (EIR) pursuant to Section 11.03 (6)(a)(6) because it requires a state permit and will generate 3,000 or more new average daily vehicle trips (adt). The project requires a Sewer Connection Permit from the Department of Environmental Protection (MassDEP) and a ground lease from the MTA.

The project is subject to Article 80 Large Project Review by the Boston Redevelopment Authority (BRA) which was completed prior to filing of the EENF Certificate. In addition, it requires the development of a Transportation Access Plan Agreement (TAPA) and Construction Management Plan (CMP) for review by the Boston Transportation Department (BTD), a Curb Cut Permit from the Boston Public Works Department (PWD) and Boston Parks and Recreation Commission approval for construction of a building within 100 feet of a park.

Summary of Potential Environmental Impacts

Potential environmental impacts are associated with the generation of approximately 3,054 average daily vehicle trips (adt) based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, use of 63,860 gallons per day (gpd) of water, generation of 58,000 gpd of wastewater and use of landlocked tidelands. Re-development of this site that is located in close proximity to transit will minimize overall impacts. The ENF indicates that measures to avoid, minimize and mitigate environmental impacts include: incorporation of sustainable design elements as required by Article 37 of the Boston Zoning Code; development of a Transportation Demand Management (TDM) program and a limited parking supply to minimize traffic trips; and support for streetscape improvements including a $300,000 contribution to the City of Boston Crossroads Initiative.

Because the proponent is seeking a land transfer, in the form of a ground lease, MEPA jurisdiction extends to those aspects of the project within the area subject to the land transfer that are likely, directly or indirectly, to cause Damage to the Environment. Pursuant to 301 CMR 11.01(2)(a)(3), MEPA subject matter jurisdiction is functionally equivalent to full scope jurisdiction.

Summary of Proposed Mitigation Measures

The EENF and supplemental information provided on February 27, 2008, identify the project's consistency with the Commonwealth's Sustainable Development Principles and describe the following measures to avoid, minimize and mitigate environmental impacts:

- Re-development of a vacant lot located in close proximity to transit;
- design of a LEED Certifiable building consistent with requirements of Article 37 of the Boston Zoning Code;
- provision of adequate pedestrian access around and through the site including wide sidewalks, lighting and street furniture;
- development of a Transportation Demand Management (TDM) program (including transit pass subsidies) and a limited parking supply to minimize vehicle trips;
- support for streetscape improvements including a $300,000 contribution to the City of Boston Crossroads Initiative; and
- support for additional traffic analysis including $50,000 for a comprehensive study of the Bulfinch Triangle neighborhood.

In addition, the proponent indicates its goal to certify the project at the Silver level which will require a commitment to incorporate into the project design additional measures beyond those identified in the LEED project checklist included with the EENF.

Waiver Request

The proponent has requested a waiver from the requirement to prepare an EIR. The proponent submitted an EENF in conjunction with this request. The EENF identifies the environmental impacts of the project and describes measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts. The waiver request was discussed at the consultation/scoping session for the project which was held on January 17, 2008.

Standards for All Waivers

The MEPA regulations at 301 CMR 11.11(1) state that I may waive any provision or requirement in 301 CMR 11.00 not specifically required by MEPA and may impose appropriate and relevant conditions or restrictions, provided that I find that strict compliance with the provision or requirement would:

(a) Result in an undue hardship for the Proponent, unless based on delay in compliance by the Proponent; and,

(b) Not serve to avoid or minimize Damage to the Environment.

Determinations for an EIR Waiver

The MEPA regulations at 301 CMR 11.11(3) state that, in the case of a waiver of a mandatory EIR review threshold, I shall at a minimum base the finding required in accordance with 301 CMR 11.11(1)(b) stated above on a determination that:

(a) The project is likely to cause no Damage to the Environment; and,

(b) Ample and unconstrained infrastructure facilities and services exist to support those aspects of the project within subject matter jurisdiction.

Findings

Based upon the information submitted by the Proponent, consultation with the relevant state agencies, and comment letters submitted on the project, I find that the waiver request has merit and that the Proponent has demonstrated that the proposed project meets the standards for all waivers at 301 CMR 11.11(1).

As noted previously, the EENF identifies the environmental impacts of the project, identifies the project's consistency with the Commonwealth's Sustainable Development Principles and describes how the design and long-term operation of the building will minimize greenhouse gas emissions. The EENF included a traffic study, additional information regarding historic impacts and describes measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts.

State agency action associated with the project is limited to the issuance of a Sewer Connection Permit by MassDEP and a ground lease by MTA. Comments from MassDEP indicate that the agency has no objections to the issuance of a Waiver if it is conditioned upon compliance with the removal of extraneous clean water (Inflow/Infiltration (I/I)) from the sewer system. The EENF contains sufficient information to allow state agencies to understand the environmental consequences of its permit decision.

MHC, as the State Historic Preservation Officer, has reviewed the project as required by the "joint development" process of the Central Artery/Tunnel (CA/T) Project and the associated Memorandum of Agreement (MOA). Comments from MHC note that the height of the building is acceptable given the site constraints (for access to utilities and to the tunnels) and that the massing of the building components step back from the Bulfinch Triangle Historic District. Comments from BED indicate that the Boston Landmarks Commission (BLC) shares the viewpoint of MHC that the overall scale and massing minimize the impact and the architectural design is sympathetic to the neighborhood context. MHC comments indicate that more detailed designs must be provided for review as the project progresses.

Other comments letters received on the project do not identify any additional alternatives that should be analyzed or environmental issues that require significant additional analysis.

Comments from the Boston Groundwater Trust provided to the BRA (dated December 3, 2007) do not identify any significant concerns with the impact of the project on groundwater levels or request monitoring of groundwater levels at the site. The comment letter from Downtown North Association (DNA) indicates its strong support for granting of a waiver and identifies the project's consistency with longstanding design and planning goals.

As noted previously, the categorical requirement to prepare an EIR is based on exceedance of a transportation threshold. As noted previously, trip generation is estimated at over 3,000 adt based on the ITE Trip Generation Manual. According to the EENF, adjusting this estimate using BTD mode shares, results in an estimate of 702 adt. This estimate is significantly lower than the mandatory EIR threshold of 3,000 adt and also below the ENF threshold of 2,000 adt. In addition, the trip generation and traffic impacts of the project have been reviewed by the City and BTD through the BRA Article 80 process. This review has resulted in a design that incorporates measures routinely required or encouraged through MEPA review including a low parking ratio, development of an effective TDM program, provision of transit subsidies and adequate pedestrian and bicycle infrastructure.

Based on the foregoing, I find that preparation of an EIR is not necessary in order for the proponent to demonstrate that it will avoid, minimize, and mitigate potential Damage to the Environment to the maximum extent practicable. Strict compliance with the requirement to prepare an EIR would therefore cause undue hardship and would not serve to minimize Damage to the Environment.

I also find that compliance with the requirement to prepare an EIR for the project would not serve to avoid or minimize Damage to the Environment. In accordance with 301 CMR 11.11(3), this finding is based on my determination that:

1. The project is likely to cause no Damage to the Environment:

- The project consists of redevelopment of a vacant lot, comprised entirely of impervious surfaces. The site does not contain any significant natural resources or protected open space or parkland. Adequate mitigation will be provided for impacts to landlocked tidelands, transportation, wastewater and historic resources.

- The project is consistent with the Commonwealth's Sustainable Development Principles and is designed to be LEED certifiable. Sustainable design elements include the redevelopment of an existing site in close proximity to transit, a low parking ratio, a TDM program including transit subsidies and bike storage, green or cool roofing materials, re-use of stormwater for irrigation, water conservation and building commissioning. In addition, it may include the purchase of renewable energy credits, low emitting materials and enhanced daylighting.

2. Ample and unconstrained infrastructure facilities and services exist to support those aspects of the project within subject matter jurisdiction:

- MassDEP and MWRA indicate that I/I mitigation can and should be provided to address any potential impacts to the wastewater infrastructure.

- Adequate pedestrian circulation is provided around and through the site and contributions to the Crossroads Initiative will improve pedestrian access and safety along Causeway Street;

- The BRA Board approved the project on December 20, 2007, thereby indicating that the project has provided an adequate description of and mitigation for potential community impacts.

3. The proposal to grant the Waiver is conditioned on the following to ensure the environmental impacts of the project are minimized:

- The proponent will remove or cause to be removed approximately 232,000 gpd of I/I from the wastewater system.

- The proponent will provide detailed project designs to MHC for review and approval per the terms of the Central Artery/Tunnel (CA/T) Memorandum of Agreement (MOA).

- Consistent with Article 32, Section 6 of the Boston Zoning Code, the proponent will certify that the project will not negatively impact groundwater levels on the site or on adjacent lots.

Conclusion

Based on these findings, I have determined that this waiver request has merit, and am issuing this Draft Record of Decision (DROD), which will be published in the next edition of the Environmental Monitor on March 12, 2008 in accordance with 301 CMR 11.15(2), which begins the public comment period. The public comment period lasts for 14 days and will end on March 26, 2008. Based on written comments received concerning the DROD, I shall issue a Final Record of Decision (FROD) or a Scope within seven days after the close of the public comment period, in accordance with 301 CMR 11.15(6). I hereby **propose to grant the waiver** requested for this project from the requirement to prepare a mandatory Environmental Impact Report (EIR), subject to the above findings and conditions.

February 29, 2008
Date

Ian A. Bowles

Comments received:

1/23/08	Department of Environmental Protection/Northeast Regional Office (MassDEP NERO)
1/16/08	Massachusetts Historical Commission (MHC)
2/21/08	Massachusetts Historical Commission (MHC) (second letter)
1/23/08	Massachusetts Water Resources Authority (MWRA)
1/23/08	City of Boston Environment Department
2/19/08	Downtown North Association

IAB/CDB/cdb

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March 28, 2008

FINAL RECORD OF DECISION

PROJECT NAME	: Simpson Parcel 1
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 14153
PROJECT PROPONENT	: SHLP-Bulfinch LLC
DATE NOTICED IN MONITOR	: March 12, 2008

Pursuant to the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and Section 11.11 of the MEPA Regulations (301 CMR 11.00), I have reviewed this project and hereby **grant a Waiver** from the categorical requirement to prepare an Environmental Impact Report (EIR).

Project Description

As described in the Expanded Environmental Notification Form (EENF), the proposed project consists of the design and construction of a 361,450 gross square foot (sf) mixed-use development on a 45,394 sf parcel in the Bulfinch Triangle. The parcel is owned by the Massachusetts Turnpike Authority (MTA). The proponent was designated as the developer of this parcel by the MTA following a public Request for Proposal process that included public presentations and meetings. The proponent will lease the property from MTA through a ground lease. The project will include approximately 14,910 sf of retail space on the ground floor (including 11,940 sf of restaurant space), a 142-space parking garage on the second, third and fourth floors and 283 residential units on the remaining floors.

The site is bounded by Haverhill Street, Causeway Street, Beverly Street and Valenti Way. The site consists primarily of impervious surfaces. It is located above the Massachusetts

Bay Transportation Authority (MBTA) Green and Orange Line Stations and directly across from the commuter rail at North Station. The site includes utility corridors, emergency tunnel access, MBTA station access and MBTA air shafts. It is located on landlocked tidelands approximately 475 feet from the shoreline of Boston Inner Harbor and within the City of Boston Groundwater Conservation Overlay District. The parcel was created through the Central Artery/Tunnel (CA/T) project and is owned by the MTA.

Jurisdiction

The project is undergoing MEPA review and subject to preparation of mandatory Environmental Impact Report (EIR) pursuant to Section 11.03 (6)(a)(6) because it requires a state permit and will generate 3,000 or more new average daily vehicle trips (adt). The project requires a Sewer Connection Permit from the Department of Environmental Protection (MassDEP) and a ground lease from the MTA.

The project is subject to Article 80 Large Project Review by the Boston Redevelopment Authority (BRA) which was completed prior to filing of the EENF Certificate. In addition, it requires the development of a Transportation Access Plan Agreement (TAPA) and Construction Management Plan (CMP) for review by the Boston Transportation Department (BTD), a Curb Cut Permit from the Boston Public Works Department (PWD) and Boston Parks and Recreation Commission approval for construction of a building within 100 feet of a park.

Summary of Potential Environmental Impacts

Potential environmental impacts are associated with the generation of approximately 3,054 average daily vehicle trips (adt) based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, use of 63,860 gallons per day (gpd) of water, generation of 58,000 gpd of wastewater and use of landlocked tidelands. Re-development of this site that is located in close proximity to transit will minimize overall impacts. The ENF indicates that measures to avoid, minimize and mitigate environmental impacts include: incorporation of sustainable design elements as required by Article 37 of the Boston Zoning Code; development of a Transportation Demand Management (TDM) program and a limited parking supply to minimize traffic trips; and support for streetscape improvements including a $300,000 contribution to the City of Boston Crossroads Initiative.

Because the proponent is seeking a land transfer, in the form of a ground lease, MEPA jurisdiction extends to those aspects of the project within the area subject to the land transfer that are likely, directly or indirectly, to cause Damage to the Environment. Pursuant to 301 CMR 11.01(2)(a)(3), MEPA subject matter jurisdiction is functionally equivalent to full scope jurisdiction.

Summary of Proposed Mitigation Measures

The EENF and supplemental information provided on February 27, 2008, identify the project's consistency with the Commonwealth's Sustainable Development Principles and describe the following measures to avoid, minimize and mitigate environmental impacts:

- Re-development of a vacant lot located in close proximity to transit;
- design of a LEED Certifiable building consistent with requirements of Article 37 of the Boston Zoning Code;
- provision of adequate pedestrian access around and through the site including wide sidewalks, lighting and street furniture;
- development of a Transportation Demand Management (TDM) program (including transit pass subsidies) and a limited parking supply to minimize vehicle trips;
- support for streetscape improvements including a $300,000 contribution to the City of Boston Crossroads Initiative; and
- support for additional traffic analysis including $50,000 for a comprehensive study of the Bulfinch Triangle neighborhood.

In addition, the proponent indicates its goal to certify the project at the Silver level which will require a commitment to incorporate into the project design additional measures beyond those identified in the LEED project checklist included with the EENF.

Waiver Request

The proponent has requested a Waiver from the requirement to prepare an EIR. The proponent submitted an EENF in conjunction with this request. The EENF identifies the environmental impacts of the project and describes measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts. The waiver request was discussed at the consultation/scoping session for the project which was held on January 17, 2008.

A Draft Record of Decision (DROD), proposing to grant a waiver, was published in the March 12, 2008 Environmental Monitor and was subject to a 14-day public comment period. No comments were received on the DROD.

Standards for All Waivers

The MEPA regulations at 301 CMR 11.11(1) state that I may waive any provision or requirement in 301 CMR 11.00 not specifically required by MEPA and may impose appropriate and relevant conditions or restrictions, provided that I find that strict compliance with the provision or requirement would:

(a) Result in an undue hardship for the Proponent, unless based on delay in compliance by the Proponent; and,

(b) Not serve to avoid or minimize Damage to the Environment.

Determinations for an EIR Waiver

The MEPA regulations at 301 CMR 11.11(3) state that, in the case of a waiver of a mandatory EIR review threshold, I shall at a minimum base the finding required in accordance with 301 CMR 11.11(1)(b) stated above on a determination that:

(a) The project is likely to cause no Damage to the Environment; and,

(b) Ample and unconstrained infrastructure facilities and services exist to support those aspects of the project within subject matter jurisdiction.

Findings

Based upon the information submitted by the Proponent, consultation with the relevant state agencies, and comment letters submitted on the project, I find that the waiver request has merit and that the Proponent has demonstrated that the proposed project meets the standards for all waivers at 301 CMR 11.11(1).

As noted previously, the EENF identifies the environmental impacts of the project, identifies the project's consistency with the Commonwealth's Sustainable Development Principles and describes how the design and long-term operation of the building will minimize greenhouse gas emissions. The EENF included a traffic study, additional information regarding historic impacts and describes measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts.

State agency action associated with the project is limited to the issuance of a Sewer Connection Permit by MassDEP and a ground lease by MTA. Comments from MassDEP on the EENF indicate that the agency has no objections to the issuance of a Waiver if it is conditioned upon compliance with the removal of extraneous clean water (Inflow/Infiltration (I/I)) from the sewer system. The EENF contains sufficient information to allow state agencies to understand the environmental consequences of its permit decision.

MHC, as the State Historic Preservation Officer, has reviewed the project as required by the "joint development" process of the Central Artery/Tunnel (CA/T) Project and the associated Memorandum of Agreement (MOA). Comments from MHC note that the height of the building is acceptable given the site constraints (for access to utilities and to the tunnels) and that the massing of the building components step back from the Bulfinch Triangle Historic District. Comments from BED indicate that the Boston Landmarks Commission (BLC) shares the viewpoint of MHC that the overall scale and massing minimize the impact and the architectural design is sympathetic to the neighborhood context. MHC comments on the EENF indicate that more detailed designs must be provided for review as the project progresses.

Comments on the EENF did not identify any additional alternatives that should be analyzed or environmental issues that require significant additional analysis. Comments from the Boston Groundwater Trust provided to the BRA (dated December 3, 2007) do not identify any significant concerns with the impact of the project on groundwater levels or request monitoring of groundwater levels at the site. The comment letter on the EENF from Downtown North Association (DNA) indicates its strong support for granting of a Waiver and identifies the project's consistency with longstanding design and planning goals.

As noted previously, the categorical requirement to prepare an EIR is based on exceedance of a transportation threshold. As noted previously, trip generation is estimated at over 3,000 adt based on the ITE Trip Generation Manual. According to the EENF, adjusting this estimate using BTD mode shares, results in an estimate of 702 adt. This estimate is significantly lower than the mandatory EIR threshold of 3,000 adt and also below the ENF threshold of 2,000 adt. In addition, the trip generation and traffic impacts of the project have been reviewed by the City and BTD through the BRA Article 80 process. This review has resulted in a design that incorporates measures routinely required or encouraged through MEPA review including a low parking ratio, development of an effective TDM program, provision of transit subsidies and adequate pedestrian and bicycle infrastructure.

As part of the review of this project, I have conducted a separate Public Benefits Determination that indicates that the project will have minimal impacts on the public's right to access, use and enjoy tidelands, that the project is designed to minimize impacts to these public trust rights and that the measures identified in the EENF and codified in this FROD will ensure adequate mitigation of impacts.

Based on the foregoing, I find that preparation of an EIR is not necessary in order for the proponent to demonstrate that it will avoid, minimize, and mitigate potential Damage to the Environment to the maximum extent practicable. Strict compliance with the requirement to prepare an EIR would therefore cause undue hardship and would not serve to minimize Damage to the Environment.

I also find that compliance with the requirement to prepare an EIR for the project would not serve to avoid or minimize Damage to the Environment. In accordance with 301 CMR 11.11(3), this finding is based on my determination that:

1. The project is likely to cause no Damage to the Environment:

   - The project consists of redevelopment of a vacant lot, comprised entirely of impervious surfaces. The site does not contain any significant natural resources or protected open space or parkland. Adequate mitigation will be provided for impacts to landlocked tidelands, transportation, wastewater and historic resources.

   - The project is consistent with the Commonwealth's Sustainable Development Principles and is designed to be LEED certifiable. Sustainable design elements include the redevelopment of an existing site in close proximity to transit, a low parking ratio, a TDM program including transit subsidies and bike storage, green or cool roofing

materials, re-use of stormwater for irrigation, water conservation and building commissioning. In addition, it may include the purchase of renewable energy credits, low emitting materials and enhanced daylighting.

- The project will not cause any adverse impact on the public's right to access, use and enjoy tidelands.

- The project will not cause an adverse effect on groundwater levels in Boston.

2. Ample and unconstrained infrastructure facilities and services exist to support those aspects of the project within subject matter jurisdiction:

- Comments on the EENF from MassDEP and MWRA indicate that I/I mitigation can and should be provided to address any potential impacts to the wastewater infrastructure.

- Adequate pedestrian circulation is provided around and through the site and contributions to the Crossroads Initiative will improve pedestrian access and safety along Causeway Street;

- The BRA Board approved the project on December 20, 2007, thereby indicating that the project has provided an adequate description of and mitigation for potential community impacts.

3. The proposal to grant the Waiver is conditioned on the following to ensure the environmental impacts of the project are minimized:

- The proponent will remove or cause to be removed approximately 232,000 gpd of I/I from the wastewater system.

- The proponent will provide detailed project designs to MHC for review and approval per the terms of the Central Artery/Tunnel (CA/T) Memorandum of Agreement (MOA).

- Consistent with Article 32, Section 6 of the Boston Zoning Code, the proponent will certify that the project will not negatively impact groundwater levels on the site or on adjacent lots.

Conclusion

Based on these findings, I have determined that this waiver request has merit, and hereby grant a Waiver from the requirement to prepare an EIR, subject to the above findings and conditions.

March 28, 2008
Date

Ian A. Bowles

No comments received

IAB/CDB/cdb

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March 28, 2008

PUBLIC BENEFITS DETERMINATION
OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS

PROJECT NAME	: Simpson Parcel 1
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 14153
PROJECT PROPONENT	: SHLP-Bulfinch LLC
DATE NOTICED IN MONITOR	: December 24, 2007

Consistent with the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands*, I hereby determine that the above-referenced project will have a public benefit. This determination accompanies a Final Record of Decision (FROD) that I am also issuing today.[1]

Project Description

As described in the Expanded Environmental Notification Form (EENF), the proposed project consists of the design and construction of a 361,450 gross square foot (sf) mixed-use development on a 45,394 sf parcel in the Bulfinch Triangle. The parcel is owned by the Massachusetts Turnpike Authority (MTA). The proponent was designated as the developer of this parcel by the MTA following a public Request for Proposal process that included public presentations and meetings. The proponent will lease the property from MTA through a ground lease. The project will include approximately 14,910 sf of retail space on the ground floor (including 11,940 sf of restaurant space), a 142-space parking garage on the second, third and fourth floors and 283 residential units on the remaining floors.

[1] I have convened a Technical Advisory Committee (TAC) to assist me in developing a formalized process to implement the "public benefit review" process. In the interim, the approach to the Public Benefits Determination reflected by this document should be considered provisional.

The site is bounded by Haverhill Street, Causeway Street, Beverly Street and Valenti Way. The site consists primarily of impervious surfaces. It is located above the Massachusetts Bay Transportation Authority (MBTA) Green and Orange Line Stations and directly across from the commuter rail at North Station. The site includes utility corridors, emergency tunnel access, MBTA station access and MBTA air shafts. It is located on landlocked tidelands approximately 475 feet from the shoreline of Boston Inner Harbor and within the City of Boston Groundwater Conservation Overlay District. The parcel was created through the Central Artery/Tunnel (CA/T) project and is owned by the MTA.

Permitting/Jurisdiction

The project is undergoing MEPA review and subject to preparation of mandatory Environmental Impact Report (EIR) pursuant to Section 11.03 (6)(a)(6) because it requires a state permit and will generate 3,000 or more new average daily vehicle trips (adt). The project requires a Sewer Connection Permit from the Department of Environmental Protection (MassDEP) and a ground lease from the MTA. The project does not require a Chapter 91 License.

The project is subject to Article 80 Large Project Review by the Boston Redevelopment Authority (BRA) which was completed prior to filing of the EENF Certificate. In addition, it requires the development of a Transportation Access Plan Agreement (TAPA) and Construction Management Plan (CMP) for review by the Boston Transportation Department (BTD), a Curb Cut Permit from the Boston Public Works Department (PWD) and Boston Parks and Recreation Commission approval for construction of a building within 100 feet of a park.

Landlocked Tidelands

Consistent with the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168, sec.8), which was enacted on November 15, 2008, I *must* conduct a Public Benefits Review for projects in tidelands that are required to file an EIR, and I *may* conduct a public benefit review for projects in tidelands that file only an ENF. I infer from this that the legislature wished to ensure that projects that are large enough to trigger a mandatory EIR threshold receive a Public Benefit Determination. In this instance, the project exceeds a mandatory EIR threshold, but the proponent has requested a Waiver of the requirement to prepare an EIR. In my view, it is consistent with the MEPA regulations and the spirit and intent of the legislation that a Public Benefits Determination be conducted for a project that exceeds a mandatory EIR threshold, but is not required to file an EIR due to a waiver.

The legislation states the following regarding the Public Benefits Determination:

"In making said public benefit determination, the secretary shall consider the purpose and effect of the development; the impact on abutters and the surrounding community; enhancement to the property; benefits to the public trust rights in tidelands or other associated rights, including, but not limited to, benefits provided through previously

obtained municipal permits; community activities on the development site; environmental protection and preservation; public health and safety; and the general welfare; provided further, that the secretary shall also consider the differences between tidelands, landlocked tidelands and great pond lands when assessing the public benefit and shall consider the practical impact of the public benefit on the development."

To support the Public Benefits Determination, I have reviewed the EENF, the supplemental information provided on February 27, 2008 and the comments received on the project. The following addresses each of the considerations identified in the legislation.

1. *purpose and effect of the development*

The proponent proposes to construct a residential and retail development on a vacant parcel of land located within the Bulfinch Triangle. The project will provide 283 residential units including 10 affordable housing units. As noted previously, community design standards for the Bulfinch Triangle and the subject parcel have been developed and reviewed over the past decade as part of the joint development process related to the Central Artery/Tunnel (CA/T) Project. Most recently, the project has been reviewed and approved by the Boston Redevelopment Authority (BRA), which includes a significant public participation component as part of its review process. The BRA Board approved the project on December 20, 2007, thereby indicating that the project has provided an adequate description of and mitigation for potential community impacts. Comments provided by Downtown North Association (DNA), an active participant in the joint development process and other planning efforts within the Bulfinch Triangle, indicate their full support for the project because of its consistency with design standards and the proponent's responsiveness to community concerns. The purpose and effect of the development is consistent with city and community planning and will support longstanding local and state planning goals.

2. *impact on abutters and the surrounding community*

None of the comment letters received on the project identify any specific concerns regarding impacts to abutters or the community that require additional mitigation. As noted above, the development appears consistent with longstanding planning goals and is designed to provide community benefits. I also note that the developer was selected by the MTA after a public Request for Proposals process that included a CAC in the developer selection. The impact on abutters and the surrounding community will be positive.

3. *enhancement to the property*

The project site is a vacant parcel, comprised primarily of impervious surfaces, that has been identified as a development parcel as part of the CA/T Project. The development of this parcel will provide additional residential units in an area of the City targeted for growth and revitalization. Proposed lighting and signage, incorporation of active retail/commercial uses, widened sidewalks, and provision of benches, planters and street trees will create a safer and more attractive pedestrian environment. The project includes vehicular and pedestrian access through the site in the form of a porte cochere. The project's construction will improve and

enhance the property and its surrounding environment.

4. *benefits to the public trust rights in tidelands or other associated rights*

The landlocked parcel is located approximately 475 feet from Boston Inner Harbor. It is located on the landward side of Commercial Street in a mixed use area that includes entertainment, retail and residential uses.

The building is designed to expand and enhance the visual and physical connections between the Bulfinch Triangle and the Charles River. This design will be reinforced through the significant contributions to implementation of streetscape plans that strengthen the visual and pedestrian links along Beverly Street between the Rose Kennedy Greenway to the south and Portal Park to the north. Portal Park marks the entry to the New Charles River Basin Parks immediately to the north. The view corridor between the Zakim Bridge and the historic Custom House will be retained along Beverly Street. Improvements will extend along Causeway Street to its intersection with North Washington Street and improve access to Boston Harbor.

The project will not interfere with access to the waterfront or open space. As noted above, it will support access to the waterfront and to open spaces and parks in the area including Portal Park and the Rose Kennedy Greenway.

The project provides benefits to the public trust rights in tidelands.

5. *community activities on the development site*

The project will provide 283 residential units including 10 affordable housing units on-site. The building will include active ground-level uses including retail and restaurant uses which will be open to the public. A two-story restaurant will include public open space and outdoor dining overlooking the Zakim Bridge. In addition, it will provide approximately 60 spaces for bicycle parking within the garage.

6. *environmental protection and preservation*

The project consists of redevelopment of a vacant lot, comprised entirely of impervious surfaces. The site does not contain any significant natural resources or public protected open space or parkland. It is located within the City of Boston Groundwater Overlay District. Consistent with City of Boston requirements, the project will be LEED certifiable. Sustainable design elements include the redevelopment of an existing site in close proximity to transit, a low parking ratio, a TDM program including transit subsidies and bike storage, reduction of heat island effect through a white roof or a green roof, re-use of stormwater for irrigation, water conservation and building commissioning. In addition, it may include the purchase of renewable energy credits, low emitting materials and enhanced daylighting.

Because the project will be constructed over transit and highway tunnels, its impact on groundwater will be minimal. Pursuant to Article 32, Section 6 of the Boston Zoning Code,

the proponent will certify that the project will not negatively impact groundwater levels on the site or on adjacent lots. Comments from the Boston Groundwater Trust provided to the BRA (dated December 3, 2007) do not identify any significant concerns with impact of the project on groundwater levels or request monitoring of groundwater levels at the site.

Comments received from the Massachusetts Historical Commission (MHC) and the Boston Environment Department (BED) indicate that the proposed building will exceed height limits developed to protect historic resources. Comments from MHC note that the height is acceptable given the site constraints (for access to utilities and to the tunnels) and the fact that the massing of the building components step back from the Bulfinch Triangle Historic District. Comments from BED indicate that the Boston Landmarks Commission (BLC) shares the viewpoint of MHC that the overall scale and massing minimize the impact and the architectural design is sympathetic to the neighborhood context. The proponent will be required to provide more detailed design documents to MHC as a condition of the DROD. In a separate Certificate issued on February 29, 2008, I determined that the project has adequately avoided, minimized and mitigated potential impacts pursuant to the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and the MEPA Regulations (301 CMR 11.00). In the FROD, also issued today, I have granted a Waiver from the requirement to prepare an EIR.

7. *public health and safety*

The replacement of a vacant lot with active residential and retail uses will promote public safety. The contribution to streetscape improvements will encourage walking and transit and improve the safety or the pedestrian environment.

Conclusion

Based on the foregoing, I hereby determine that the project will have a positive public benefit.

To meet the public publication requirements of the legislation, this Determination will be published in the next edition of the Environmental Monitor on April 9, 2008

March 28, 2008
Date

Ian A. Bowles

Comments received:

1/23/08	Department of Environmental Protection/Northeast Regional Office (MassDEP NERO)
1/16/08	Massachusetts Historical Commission (MHC)
2/21/08	Massachusetts Historical Commission (MHC) (second letter)
1/23/08	Massachusetts Water Resources Authority (MWRA)
1/23/08	City of Boston Environment Department
2/19/08	Downtown North Association
1/23/08	Sierra Club

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March 28, 2008

FINAL RECORD OF DECISION

PROJECT NAME	: Simpson Parcel 1
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 14153
PROJECT PROPONENT	: SHLP-Bulfinch LLC
DATE NOTICED IN MONITOR	: March 12, 2008

Pursuant to the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and Section 11.11 of the MEPA Regulations (301 CMR 11.00), I have reviewed this project and hereby **grant a Waiver** from the categorical requirement to prepare an Environmental Impact Report (EIR).

Project Description

As described in the Expanded Environmental Notification Form (EENF), the proposed project consists of the design and construction of a 361,450 gross square foot (sf) mixed-use development on a 45,394 sf parcel in the Bulfinch Triangle. The parcel is owned by the Massachusetts Turnpike Authority (MTA). The proponent was designated as the developer of this parcel by the MTA following a public Request for Proposal process that included public presentations and meetings. The proponent will lease the property from MTA through a ground lease. The project will include approximately 14,910 sf of retail space on the ground floor (including 11,940 sf of restaurant space), a 142-space parking garage on the second, third and fourth floors and 283 residential units on the remaining floors.

The site is bounded by Haverhill Street, Causeway Street, Beverly Street and Valenti Way. The site consists primarily of impervious surfaces. It is located above the Massachusetts

Bay Transportation Authority (MBTA) Green and Orange Line Stations and directly across from the commuter rail at North Station. The site includes utility corridors, emergency tunnel access, MBTA station access and MBTA air shafts. It is located on landlocked tidelands approximately 475 feet from the shoreline of Boston Inner Harbor and within the City of Boston Groundwater Conservation Overlay District. The parcel was created through the Central Artery/Tunnel (CA/T) project and is owned by the MTA.

Jurisdiction

The project is undergoing MEPA review and subject to preparation of mandatory Environmental Impact Report (EIR) pursuant to Section 11.03 (6)(a)(6) because it requires a state permit and will generate 3,000 or more new average daily vehicle trips (adt). The project requires a Sewer Connection Permit from the Department of Environmental Protection (MassDEP) and a ground lease from the MTA.

The project is subject to Article 80 Large Project Review by the Boston Redevelopment Authority (BRA) which was completed prior to filing of the EENF Certificate. In addition, it requires the development of a Transportation Access Plan Agreement (TAPA) and Construction Management Plan (CMP) for review by the Boston Transportation Department (BTD), a Curb Cut Permit from the Boston Public Works Department (PWD) and Boston Parks and Recreation Commission approval for construction of a building within 100 feet of a park.

Summary of Potential Environmental Impacts

Potential environmental impacts are associated with the generation of approximately 3,054 average daily vehicle trips (adt) based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, use of 63,860 gallons per day (gpd) of water, generation of 58,000 gpd of wastewater and use of landlocked tidelands. Re-development of this site that is located in close proximity to transit will minimize overall impacts. The ENF indicates that measures to avoid, minimize and mitigate environmental impacts include: incorporation of sustainable design elements as required by Article 37 of the Boston Zoning Code; development of a Transportation Demand Management (TDM) program and a limited parking supply to minimize traffic trips; and support for streetscape improvements including a $300,000 contribution to the City of Boston Crossroads Initiative.

Because the proponent is seeking a land transfer, in the form of a ground lease, MEPA jurisdiction extends to those aspects of the project within the area subject to the land transfer that are likely, directly or indirectly, to cause Damage to the Environment. Pursuant to 301 CMR 11.01(2)(a)(3), MEPA subject matter jurisdiction is functionally equivalent to full scope jurisdiction.

Summary of Proposed Mitigation Measures

The EENF and supplemental information provided on February 27, 2008, identify the project's consistency with the Commonwealth's Sustainable Development Principles and describe the following measures to avoid, minimize and mitigate environmental impacts:

- Re-development of a vacant lot located in close proximity to transit;
- design of a LEED Certifiable building consistent with requirements of Article 37 of the Boston Zoning Code;
- provision of adequate pedestrian access around and through the site including wide sidewalks, lighting and street furniture;
- development of a Transportation Demand Management (TDM) program (including transit pass subsidies) and a limited parking supply to minimize vehicle trips;
- support for streetscape improvements including a $300,000 contribution to the City of Boston Crossroads Initiative; and
- support for additional traffic analysis including $50,000 for a comprehensive study of the Bulfinch Triangle neighborhood.

In addition, the proponent indicates its goal to certify the project at the Silver level which will require a commitment to incorporate into the project design additional measures beyond those identified in the LEED project checklist included with the EENF.

Waiver Request

The proponent has requested a Waiver from the requirement to prepare an EIR. The proponent submitted an EENF in conjunction with this request. The EENF identifies the environmental impacts of the project and describes measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts. The waiver request was discussed at the consultation/scoping session for the project which was held on January 17, 2008.

A Draft Record of Decision (DROD), proposing to grant a waiver, was published in the March 12, 2008 Environmental Monitor and was subject to a 14-day public comment period. No comments were received on the DROD.

Standards for All Waivers

The MEPA regulations at 301 CMR 11.11(1) state that I may waive any provision or requirement in 301 CMR 11.00 not specifically required by MEPA and may impose appropriate and relevant conditions or restrictions, provided that I find that strict compliance with the provision or requirement would:

(a) Result in an undue hardship for the Proponent, unless based on delay in compliance by the Proponent; and,

(b) Not serve to avoid or minimize Damage to the Environment.

Determinations for an EIR Waiver

The MEPA regulations at 301 CMR 11.11(3) state that, in the case of a waiver of a mandatory EIR review threshold, I shall at a minimum base the finding required in accordance with 301 CMR 11.11(1)(b) stated above on a determination that:

(a) The project is likely to cause no Damage to the Environment; and,

(b) Ample and unconstrained infrastructure facilities and services exist to support those aspects of the project within subject matter jurisdiction.

Findings

Based upon the information submitted by the Proponent, consultation with the relevant state agencies, and comment letters submitted on the project, I find that the waiver request has merit and that the Proponent has demonstrated that the proposed project meets the standards for all waivers at 301 CMR 11.11(1).

As noted previously, the EENF identifies the environmental impacts of the project, identifies the project's consistency with the Commonwealth's Sustainable Development Principles and describes how the design and long-term operation of the building will minimize greenhouse gas emissions. The EENF included a traffic study, additional information regarding historic impacts and describes measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts.

State agency action associated with the project is limited to the issuance of a Sewer Connection Permit by MassDEP and a ground lease by MTA. Comments from MassDEP on the EENF indicate that the agency has no objections to the issuance of a Waiver if it is conditioned upon compliance with the removal of extraneous clean water (Inflow/Infiltration (I/I)) from the sewer system. The EENF contains sufficient information to allow state agencies to understand the environmental consequences of its permit decision.

MHC, as the State Historic Preservation Officer, has reviewed the project as required by the "joint development" process of the Central Artery/Tunnel (CA/T) Project and the associated Memorandum of Agreement (MOA). Comments from MHC note that the height of the building is acceptable given the site constraints (for access to utilities and to the tunnels) and that the massing of the building components step back from the Bulfinch Triangle Historic District. Comments from BED indicate that the Boston Landmarks Commission (BLC) shares the viewpoint of MHC that the overall scale and massing minimize the impact and the architectural design is sympathetic to the neighborhood context. MHC comments on the EENF indicate that more detailed designs must be provided for review as the project progresses.

Comments on the EENF did not identify any additional alternatives that should be analyzed or environmental issues that require significant additional analysis. Comments from the Boston Groundwater Trust provided to the BRA (dated December 3, 2007) do not identify any significant concerns with the impact of the project on groundwater levels or request monitoring of groundwater levels at the site. The comment letter on the EENF from Downtown North Association (DNA) indicates its strong support for granting of a Waiver and identifies the project's consistency with longstanding design and planning goals.

As noted previously, the categorical requirement to prepare an EIR is based on exceedance of a transportation threshold. As noted previously, trip generation is estimated at over 3,000 adt based on the ITE Trip Generation Manual. According to the EENF, adjusting this estimate using BTD mode shares, results in an estimate of 702 adt. This estimate is significantly lower than the mandatory EIR threshold of 3,000 adt and also below the ENF threshold of 2,000 adt. In addition, the trip generation and traffic impacts of the project have been reviewed by the City and BTD through the BRA Article 80 process. This review has resulted in a design that incorporates measures routinely required or encouraged through MEPA review including a low parking ratio, development of an effective TDM program, provision of transit subsidies and adequate pedestrian and bicycle infrastructure.

As part of the review of this project, I have conducted a separate Public Benefits Determination that indicates that the project will have minimal impacts on the public's right to access, use and enjoy tidelands, that the project is designed to minimize impacts to these public trust rights and that the measures identified in the EENF and codified in this FROD will ensure adequate mitigation of impacts.

Based on the foregoing, I find that preparation of an EIR is not necessary in order for the proponent to demonstrate that it will avoid, minimize, and mitigate potential Damage to the Environment to the maximum extent practicable. Strict compliance with the requirement to prepare an EIR would therefore cause undue hardship and would not serve to minimize Damage to the Environment.

I also find that compliance with the requirement to prepare an EIR for the project would not serve to avoid or minimize Damage to the Environment. In accordance with 301 CMR 11.11(3), this finding is based on my determination that:

1. The project is likely to cause no Damage to the Environment:

- The project consists of redevelopment of a vacant lot, comprised entirely of impervious surfaces. The site does not contain any significant natural resources or protected open space or parkland. Adequate mitigation will be provided for impacts to landlocked tidelands, transportation, wastewater and historic resources.

- The project is consistent with the Commonwealth's Sustainable Development Principles and is designed to be LEED certifiable. Sustainable design elements include the redevelopment of an existing site in close proximity to transit, a low parking ratio, a TDM program including transit subsidies and bike storage, green or cool roofing

materials, re-use of stormwater for irrigation, water conservation and building commissioning. In addition, it may include the purchase of renewable energy credits, low emitting materials and enhanced daylighting.

- The project will not cause any adverse impact on the public's right to access, use and enjoy tidelands.

- The project will not cause an adverse effect on groundwater levels in Boston.

2. Ample and unconstrained infrastructure facilities and services exist to support those aspects of the project within subject matter jurisdiction:

- Comments on the EENF from MassDEP and MWRA indicate that I/I mitigation can and should be provided to address any potential impacts to the wastewater infrastructure.

- Adequate pedestrian circulation is provided around and through the site and contributions to the Crossroads Initiative will improve pedestrian access and safety along Causeway Street;

- The BRA Board approved the project on December 20, 2007, thereby indicating that the project has provided an adequate description of and mitigation for potential community impacts.

3. The proposal to grant the Waiver is conditioned on the following to ensure the environmental impacts of the project are minimized:

- The proponent will remove or cause to be removed approximately 232,000 gpd of I/I from the wastewater system.

- The proponent will provide detailed project designs to MHC for review and approval per the terms of the Central Artery/Tunnel (CA/T) Memorandum of Agreement (MOA).

- Consistent with Article 32, Section 6 of the Boston Zoning Code, the proponent will certify that the project will not negatively impact groundwater levels on the site or on adjacent lots.

Conclusion

Based on these findings, I have determined that this waiver request has merit, and hereby grant a Waiver from the requirement to prepare an EIR, subject to the above findings and conditions.

March 28, 2008
Date

Ian A. Bowles

No comments received

IAB/CDB/cdb

Expanded ENF

ADD Inc ARCHITECTURE + DESIGN

LEED NC 2.2 CHECKLIST

Simpson Housing- Bulfinch Parcel 1, Boston, MA

Certified 26 to 32
Silver 33 to 38
Gold 39 to 51
Platinum 52 or more

69 | 26 | 23 | 26

Points Available	Points Attained: YES	MAYBE	NO	CREDIT AND DESCRIPTION	NOTES	SUBMITTAL PHASE
SUSTAINABLE SITES (14)						
	X			P1 **Prerequisite** Construction Activity Pollution Prevention (erosion & sedimentation control plan)	Standard Erosion Control	Construction
1	1			1.0 **Site Selection** Avoid inappropriate site development	Urban site	Design
1	1			2.0 **Development Density & Community Connectivity** Develop urban areas w/ exist.	Perform calculations to show site is in a dense area.	Design
1			1	3.0 **Brownfield Redevelopment** Rehabilitate damaged sites	Does not apply.	Design
1	1			4.1 **Alternative Transportation** Public Transportation Access	Demonstrate that we are close to public transportation	Design
1	1			4.2 **Alternative Transportation** Bicycle Storage and Changing Rooms	Covered bike storage for 15% occupants plus showers for staff	Design
1	1			4.3 **Alternative Transportation** Low-Emission & Fuel Efficient Vehicles	Prefered parking for fuel efficient vehicles; either 3% of occupants or 5% spaces	Design
1	1			4.4 **Alternative Transportation** Parking Capacity	Parking shall not exceed zoning; AND provide vanpool parking, rideshare, ride boards, "shuttle" to mass transit	Design
1		1		5.1 **Site Development** Protect or Restore Habitat	Restore 50% site area (excluding footprint). Can include green roof to protect 20% site area.	
1		1		5.2 **Site Development** Maximize Open Space	If no open space requirement for zoning, then provide 20% open space. Can include green roof and pedestrian oriented hardscape areas w/ 25% open space.	Design
1		1		6.1 **Stormwater Design** Quantity Control	If site is < 50% impervious (green), then post development discharge rate must be less than pre-development discharge rate for 1 and 2-year 24hr storm. If site is > 50% impervious (developed), then reduce stormwater runoff by 25% for 2-yr 24hour storm.	Design
1		1		6.2 **Stormwater Design** Quality Control	Impliment stormwater management plan to reduce impervious cover, promote infiltration, and capture and treat stormwater runoff from 90% annual rainfall. Best management practices must remove 80% annual TSS based on monitoring reports.	Design
1	1			7.1 **Heat Island Effect** Non-Roof (50% of site hardscape)	Provide a minimum of 50% covered parking.	Construction
1	1			7.2 **Heat Island Effect** Roof (50-75% of roof area)	1. 75% of roof is white OR 2. 50% roof is green OR 3. Combination to meet above requirements	Design
1			1	8.0 **Light Pollution Reduction** Minimize light trespass from building and site	INTERIOR: Angle of maximum candela shall not pass thru window OR use automatic shut off during non-business hours (timers, occupancy sensors, programmed functions) EXTERIOR: Only light areas for safety and comfort; do not exceed 80% power densities for exterior, and 50% for facade and landscape features per ASHREA/IESNA 90.1-2004.	Design
14	8	4	2	**Total Sustainable Sites Points**		
WATER EFFICIENCY (5)						
1	1			1.1 **Water Efficient Landscaping** Reduce by 50%	Reduce POTABLE water for irrigation by 50%; plant species, irrigation methods, use captured rainwater, etc	Design
1		1		1.2 **Water Efficient Landscaping** No Potable Water Use or No Irrigation	Use ONLY captured rainwater OR Don't water plants	Design
1			1	2.0 **Innovative Wastewater Technologies** 50% less sewage OR wastewater treated to tertiary standards & reused	Reduce potable water for use of building SEWAGE conveyance by 50% by using watser conserving fixtures	Design
1	1			3.1 **Water Use Reduction** 20% Reduction (from baseline water use)	Use 20% less water than baseline calcs not including irrigation. (Toilets, lavs, showers, and kitchen sinks.) Most likely will not use restricted showers.	Design
1		1		3.2 **Water Use Reduction** 30% Reduction (from baseline water use)	Use 30% less water than baseline calcs not including irrigation. (Toilets, lavs, showers, and kitchen sinks.) Most likely will not use restricted showers.	Design
5	2	2	1	**Total Water Efficiency Points**		

Points Available	Points Attained: YES	Points Attained: MAYBE	Points Attained: NO		CREDIT AND DESCRIPTION	NOTES	SUBMITTAL PHASE
					ENERGY AND ATMOSPHERE (EA)		
	X			P1	**Prerequisite** Fundamental Commissioning of the Building Energy Systems	Inspect and test all building systems.	Construction
	X			P2	**Prerequisite** Minimum Energy Performance (ASHRAE 90.1-2004)	Mass Code is more stringent.	Design
	X			P3	**Prerequisite** Fundamental Refrigerant Management (no CFC-based refrigerants)	Do no specify any refrigerants with CFC's.	Design
2	2			1.2	**Optimize Energy Performance** Exceed ASHRAE 90.1 by 14% New bldg / 7% Exist bldg **2 PT MINIMUM REQUIREMENT**	Whole building energy simulation; show 14% improvement compare to baseline.	Design
8		1	7	1.3	**Optimize Energy Performance** Exceed ASHRAE 90.1 by 17.5% New bldg	Whole building energy simulation; show 17.5% improvement compare to baseline.	Design
1			1	2.1	**On-Site Renewable Energy** 2.5% of energy from on-site renewable energy systems	Provide % building energy from wind, PV, geothermal,...	Design
1			1	2.2	**On-Site Renewable Energy** 7.5% of energy from on-site renewable energy systems	Provide % building energy from wind, PV, geothermal,...	Design
1			1	2.3	**On-Site Renewable Energy** 12.5% of energy from on-site renewable energy systems	Provide % building energy from wind, PV, geothermal,...	Design
1		1		3.0	**Enhanced Commissioning** Appoint third party, in addition to prerequisite	Hire third party commissioning agent to insure that MEP design is in line with Owner's Project Requirements; review MEP shops, develop systems manual, review operation w/in 10 mos after substantial completion.	Construction
1		1		4.0	**Enhanced Refrigerant Management** Reduce ozone depletion and global warming potential of HVAC&R equipment	Select refrigerants with low global warming potential and low ozone depletion values.	Design
1		1		5.0	**Measurement & Verification** Ongoing accountability of energy consumption one year post-construction	Develop a measurement and verification plan which would be implemented for 1 year of construction.	Construction
1		1		6.0	**Green Power** 35% electricity from 2 yr renewable energy contract	Provide at least 35% of the building electricity from renewable resources by engaging in a 2-year contract with a energy company that sells renewable energy.	Construction
17	2	5	10		**Total Energy and Atmosphere Points**		

					MATERIALS & RESOURCES (MR)		
	X			P1	**Prerequisite** Storage & Collection of Recyclables	Provide a dedicated area for recycling in the building for glass, paper, cardboard, plastics, metals, etc.	Design
1			1	1.1	**Building Reuse** Maintain 75% of Existing Walls, Floors, Roof	Not applicable.	Construction
1			1	1.2	**Building Reuse** Maintain 95% of Existing Walls, Floors, Roof	Not applicable.	Construction
1			1	1.3	**Building Reuse** Maintain 50% of Interior Non-Structural Elements	Not applicable.	Construction
1	1			2.1	**Construction Waste Management** Divert 50% from Disposal	Recycle at least 50% of construction waste.	Construction
1		1		2.2	**Construction Waste Management** Divert 75% from Disposal	Recycle at least 75% of construction waste.	Construction
1			1	3.1	**Materials Reuse** 5% (by cost) salvaged, refurbished or reused material	Not very practical for this project.	Construction
1			1	3.2	**Materials Reuse** 10% (by cost) salvaged, refurbished or reused material	Not very practical for this project.	Construction
1		1		4.1	**Recycled Content** 10% by cost (post-consumer + 1/2 pre-consumer)	Sum of Post-consumer + 1/2 preconsumer recycled content in building must be 10% by cost (not including MEP). Recycled content of an assembly is calculated by weight.	Construction
1		1		4.2	**Recycled Content** 20% by cost (post-consumer + 1/2 pre-consumer)	Sum of Post-consumer + 1/2 preconsumer recycled content in building must be 20% by cost (not including MEP). Recycled content of an assembly is calculated by weight.	Construction
1		1		5.1	**Regional Materials** 10% (by cost) Extracted, Processed & Manufactured Regionally	10% of building materials must be extracted, processed, and harvester or recovered within a 500 mi radius of site. If only part of the product is local, then calculate by % weight. MEP is not included.	Construction
1			1	5.2	**Regional Materials** 20% (by cost) Extracted, Processed & Manufactured Regionally	20% of building materials must be extracted, processed, and harvester or recovered within a 500 mi radius of site. If only part of the product is local, then calculate by % weight. MEP is not included.	Construction
1			1	6.0	**Rapidly Renewable Materials** 2.5% (by cost) materials w/ 10 yr or shorter harvest cycle	Rapidly renewable materials shall constitute 2.5% by value of total building materials. (Ex: cork, wool, bamboo, linoleum, wheatboard, strawboard, cotton insulation...)	Construction
1		1		7.0	**Certified Wood** 50% (by cost) of wood certified by FSC	50% of the wood products, by cost, shall be certified by the FSC. Can inlcude wood veneers.	Construction
13	1	5	7		**Sub Total Materials and Resources Issues**		

Points Available	Points Attained: Y/E	Y/N/E	NO	CREDIT AND DESCRIPTION	NOTES	SUBMITTAL PHASE
				INDOOR ENVIRONMENTAL QUALITY (EQ)		
	X			P1 **Prerequisite** Minimum IAQ Performance (ASHRAE 62.1-2004)	Meet minimum indoor air quality requirements for ASHREA 62.1-2004 sections 4,5,6,7, for mechanically vented spaces.	Design
	X			P2 **Prerequisite** Environmental Tobacco Smoke (ETS) Control	No smoking in common areas. Any exterior smoking ared must be at least 25ft from entries, intakes and operable windows opening to common ares. Seal penetrations in walls, ceilings, floors between units. Weatherstrip.	Design
1			1	1.0 **Outdoor Air Delivery Monitoring** Monitor & control CO2 levels	Install CO2 devices in all densely populated spaces. In sparely populated spaces (units) provide direct outside airflow measurement devices.	Design
1			1	2.0 **Increased Ventilation** Increase ventilation rates to 30% above ASHRAE 62.1-2004	Increase outdoor air ventilation rates to at least 30% of minimum rates per ASHRAE 62.1-2004.	Design
1	1			3.1 **Construction IAQ Management Plan** During Construction	During construction, meet or exceed recommended control measure of SMACNA guidelines. Protect absorptive materials on site. If air handlers are used during construction, use filters with MERV 8 rating. Replace filters upon occupancy.	Construction
1	1			3.2 **Construction IAQ Management Plan** Before Occupancy	Pror to ocupancy, either flush out building air totalling 14,000cf volume OR Conduct IAQ testing to demonstrate certain contaminant levels are low.	Construction
1	1			4.1 **Low-Emitting Materials** Adhesives & Sealants (VOC limits)	Specify low VOC adhesives and sealants.	Construction
1	1			4.2 **Low-Emitting Materials** Paints & Coatings (VOC limits)	Specify low VOC paints and coatings.	Construction
1	1			4.3 **Low-Emitting Materials** Carpet Systems (CRI Green Label program and VOC limits)	Specify low VOC carpet systems. Also spec Green Label carpets.	Construction
1	1			4.4 **Low-Emitting Materials** Composite Wood & Agrifiber Products (no urea-formaldehyde resins)	Specify wood and agrifiber products with no ureaformaldehyde resins.	Construction
1	1			5.0 **Indoor Chemical & Pollutant Source Control** Minimize exposure of occupants to hazardous pollutants	Install entry grates at all entrances. Properly exhaust garage and copy area. Suppy and return air filters shall have MERV 13 rating.	Design
1	1			6.1 **Controllability of Systems** Lighting (individual controls for 90% of occupants)	Provide individual lighting controls for 90% of the bulding occupants. Provide lighting controls for all shared multi-occupant spaces.	Design
1	1			6.2 **Controllability of Systems** Thermal Comfort (individual controls for 50% of occupants)	Provide individual comfort controls for 50% of building occupants. Operable windows can be included. Provide comfort controls for group occupancies.	Design
1		1		7.1 **Thermal Comfort** Design (ASHRAE 55-2004)	Design building envelope and systems to meet ASHREA 55-2004.	Design
1			1	7.2 **Thermal Comfort** Verification (implement thermal comfort survey and corrections)	Survey building occupants w/in 6 to 18 mos of occupancy re satisfaction with thermal comfort. Correct problems if more than 20% are dissatisfied.	Design
1		1		8.1 **Daylight and Views** Daylight 75% of Regularly Occupied Areas	Provide minimum daylighting in 75% of regularly occupied spaces.	Design
1	1			8.2 **Daylight and Views** Views for 90% of Regularly Occupied Areas (direct line of sight via vision glazing)	Provide outdoor views from 90% of regularly occupied spaces.	Design
15	10	2	3	**Total Indoor Environment Quality Points**		

Epsilon
ASSOCIATES INC.

1818/Parcel 1 ENF/GHG

February 27, 2008

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Secretary Ian A. Bowles
Executive Office of Energy and
Environmental Affairs
Attn: Deirdre Buckley, MEPA Office
100 Cambridge Street, Suite 900
Boston MA 02114

Subject: EEA #14153 – Simpson Parcel 1, Boston
Greenhouse Gas Emissions

Dear Secretary Bowles:

On behalf of SHLP Bulfinch LLC, Epsilon Associates is providing this letter to describe measures that the Proponent is taking to minimize greenhouse gas emissions associated with the proposed Parcel 1 Project. Recognizing that achieving greenhouse gas emissions reductions is a priority of the Commonwealth, the Proponent has taken considerable effort to ensure that the proposed Project is consistent with the State's Sustainable Design Principles, as well as with Article 37 of the City of Boston's Zoning Code, which requires that projects be LEED (Leadership in Energy and Environmental Design) certifiable.

Sustainable Development Principles

In selecting the Project site and designing the Project itself, the Proponent considered the Commonwealth's Sustainable Development Principles. The Project's consistency with those Principles is discussed below:

- **Concentrate Development and Mix Uses.** The Project site is located in the Bulfinch Triangle section of Boston on a parcel of land made available by the removal of the former elevated Central Artery. The North End, West End, and Downtown North communities came together to create the Bulfinch Triangle Development Advisory Group (BTDAG) specifically to inform the public disposition process of parcels created by the removal of the elevated Central Artery System. In 2003, Simpson Housing became an active participant in this

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public planning process. Ultimately, the BTDAG helped to craft the Bulfinch Triangle Design & Development guidelines which were included as the framework for the Massachusetts Turnpike Authority's Bulfinch Triangle Parcels public Request for Proposals, issued in 2005. Following an extensive public selection process, which included formal and informal community meetings and presentations, the Turnpike Authority designated Simpson as developer of Parcel 1 because of its proposed development's consistency with the community-developed guidelines.

- **Advance Equity.** The Project site, along with the other parcels made available by the demolition of the former elevated Central Artery, has been the subject of a lengthy public planning process which resulted in guidelines constraining the development of the parcel and ensuring that its development would be consistent with neighborhood preferences.
- **Protect Land and Ecosystems.** By selecting a previously developed site in an urban area, the Proponent has avoided impacts to environmentally sensitive lands, leaving open spaces and recreational opportunities untouched.
- **Use Natural Resources Wisely.** As described in the LEED section of this letter below, the Proponent will carefully evaluate the sources of materials to be used in constructing the proposed Project. As mentioned, the Project site was previously developed.
- **Expand Housing Opportunities.** The Project involves construction of 284 residential units, including studios, one-bedroom and two-bedroom units. The Proponent will both provide affordable units on site and contribute to the City of Boston affordable housing fund. Located in downtown Boston, the Project will provide homes where jobs and services are available, and, as described immediately below, the Project site is convenient to transit.
- **Provide Transportation Choice.** The Project is located atop the MBTA Green and Orange Lines, across the street from the MBTA commuter rail at North Station, and a short walk from the Haymarket bus station. MBTA Bus Route 4 runs down and stops on Causeway Street. The Proponent has committed to provide space for ZipCar or another car-share service, should the location prove appealing to such a service. Secure bicycle storage will be made available to residents and visitors to encourage bicycling as an alternative mode of transportation; one bicycle space per three residential units will be provided on site.
- **Increase Job and Business Opportunities.** On its ground floor, the Project includes approximately 3,000 square feet of retail space and approximately 12,000 square feet of restaurant space, providing opportunities for new

businesses to create jobs in the neighborhood. The Project will also provide between 340 and 400 temporary construction jobs over two years.

Leadership in Energy and Environmental Design

The ENF indicated that the Project would be LEED certifiable and included a LEED checklist showing that the Project would achieve at least 26 credits. Since the time of the ENF filing, the Proponent has set a goal of certifying the Project at the Silver level, which requires a minimum of 33 credits, and has directed the Project team to identify the most effective methodology for attaining the additional credits. However, the feasibility of achieving 33 credits has not yet been determined. Therefore, at this time, Simpson can only reasonably commit to securing 26 LEED credits. During the design process, the Proponent and the Project design team (including three LEED Accredited Professionals – the architect, engineer and construction manager) will evaluate incorporating green-building features in the Project, including the following:

- Reducing of the energy use in the building with high-performance envelope materials, including wall and roof insulation and windows.
- Including green or cool roofing materials.
- Incorporating native or locally appropriate landscaping that provides shading, wind protection, and habitat, while requiring minimal or climate appropriate irrigation.
- Increasing the energy performance of the building with energy efficient or Energy Star appliances.
- Investigating the possibility for on-site or purchased renewable energy sources.
- Using energy efficient light fixtures and control strategies for the common areas.
- Using high-efficiency HVAC systems and equipment.
- Reducing water use in the building with water efficient plumbing fixtures and using captured stormwater for irrigation.
- Facilitating the reduction of disposed materials and the increase in recycling of household waste generated by building occupants by making the recycling infrastructure easily accessible.
- Recycling or salvaging construction and demolition debris, with removal to appropriate recycling and reuse locations.

- Establishing a high level of indoor air quality performance with occupant-controlled ventilation control in the living areas.
- Designing and constructing the residential units to accommodate smoking within the individual dwelling units while preventing transfer of smoke and odors to common spaces and other units and prohibiting smoking in common areas.
- Reducing the quantity of indoor air contaminants by using low-emitting finish and sealant materials such as paints, carpets and woods.
- Providing a high level of thermal comfort system control for individuals.
- Incorporating operable windows with insulating glass.
- Introducing natural lighting where practicable.
- Performing on-going building management reviews of system operation, environmental conditions and indoor air quality, energy and water use, and the potential for improvements and innovations.
- Incorporating transportation demand management measures into the Project to minimize single occupant vehicle trips and their associated emissions, including the following:

  Limited Parking: The Project will have a total of 142 parking spaces, a parking ratio of 0.50 spaces per dwelling unit, in accordance with BTD guidelines. Parking spaces will be offered to building tenants to rent at market rate prices.

  Transit Subsidies: The Proponent has committed to provide renters some form of transit incentive – for example, providing each new resident a one-month "T" pass for free – and is working out the details of the subsidy in consultation with BTD.

  Orientation Packets: The Proponent will provide orientation packets to new residents containing information on the available transportation choices, including transit routes and schedules.

  Transportation Coordinator: The Proponent will designate a full-time employee in the management office as transportation coordinator to manage loading and service activities and provide alternative transportation materials to residents and retail and restaurant operators.

  Bicycle Racks: The Proponent will provide bicycle racks in secure, sheltered areas within the garage for residents. In accordance with BTD standards, one bicycle space for every three dwelling units will be provided,

for a total of 95 bicycle spaces within the building. Additionally, a standard U-shaped bicycle rack accommodating two bicycles each will be provided at each entrance to the building.

A preliminary LEED checklist for the Project was included in the Project's Environmental Notification Form. As the design evolves, the list of LEED credits will be refined.

We hope that the above is a useful accounting of the Proponent's approach to sustainable design and greenhouse gas minimization for the Parcel 1 Project.

Sincerely,

EPSILON ASSOCIATES, INC.

Laura E. Rome

Laura E. Rome
Associate

cc: Spencer Welton, Simpson Housing
Kenneth Hoffman, Holland & Knight

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
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January 23, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: The Shoppes at Harrington Farms
PROJECT MUNICIPALITY	: Shrewsbury
PROJECT WATERSHED	: Sudbury
EEA NUMBER	: 14158
PROJECT PROPONENT	: Retailscapes, LLC
DATE NOTICED IN MONITOR	: December 24, 2007

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of an Environmental Impact Report (EIR).

Project Summary

The proposed project consists of the two-phased development (Phase A,B) of 101,400 sf (sf) of commercial retail and restaurant space in four separate buildings on a 24.80-acre site located on Route 9 and South Street in Shrewsbury. Phase A of the project includes two separate 26,400 sf commercial retail buildings and 234 surface parking spaces. Phase B includes one 42,084 sf commercial retail building, a separate 6,500 sf (200 seat) restaurant building and 223 surface parking spaces. The project will generate approximately 6,850 new vehicle trips per day (tpd), and includes construction of a total of 457 new surface parking spaces. Potable water use and wastewater generation is estimated in the ENF at 11,744 gallons per day (gpd) and will be served by the Town of Shrewsbury. The project will result in the creation of approximately 8.5 acres of new impervious area. The proponent proposes one site drive on South Street and two separate site drives on Route 9. The project's internal roadway plan calls for a wetland crossing to connect the Phase A and Phase B developments.

Permits and MEPA Jurisdiction

The project is undergoing MEPA review and is subject to a mandatory EIR pursuant to Section 11.03(6)(a)(6) because it involves generation of 3,000 or more new average daily trips (adt) on roadways providing access to a single location. The project is also undergoing MEPA review pursuant to Section 11.03(6)(b)(15) because the project will result in the construction of 300 or more new parking spaces at a single location. The project requires an Access Permit from the Massachusetts Highway Department (MassHighway) for access to Route 9, and a U.S. Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Permit for stormwater discharges from a construction site of over one acre. The project will require a Section 401 Water Quality Certificate from the Department of Environmental Protection (MassDEP). The project may need a Section 404 Programmatic General Permit (Category II) from the U.S. Army Corps of Engineers (USACOE). An Order of Conditions will be required from the Shrewsbury Conservation Commission for work within a resource area. The project also requires an air quality mesoscale analysis for ozone to assess the total volatile organic compounds (VOC) and nitrogen oxides (NOx) emissions associated with all project-related vehicle trips.

The proponent is not seeking financial assistance from the Commonwealth. Therefore, MEPA jurisdiction applies to those aspects of the project within the subject matter of required, or potentially required, state permits that have the potential to cause damage to the environment as defined in the MEPA regulations. In this case, MEPA jurisdiction extends to transportation, wastewater, wetlands and stormwater.

SCOPE

General

The proponent should prepare a Draft EIR (DEIR) in accordance with the general guidance for outline and content found in Section 11.07 of the MEPA regulations as modified by this Scope. The DEIR should include a copy of this Certificate and a copy of each comment letter received. The DEIR should include a project summary, update on Phase I, and maps and plans to facilitate review and comment.

Project Description and Permitting

This section should provide updates to the project description and discuss project phasing, if appropriate. The DEIR should provide updates on the status of each state permit or agency action required, or potentially required, for the project, and the project's ability to meet applicable performance standards. The DEIR should include an update on the local permitting process, particularly with respect to any state highway issues discussed.

Alternatives Analysis

The proponent may carry forward its Preferred Alternative into the DEIR. According to the comments received from MassDEP, the proponent will also need to conduct an analysis of project design alternatives to avoid, minimize and mitigate the project's impacts to wetlands resource areas, and improve the project's stormwater management plan. As I have noted elsewhere in this Certificate, I strongly encourage the proponent to respond to MassDEP's comments and to explore additional opportunities to further reduce the project's impacts to wetland resources located within and adjacent to the project site.

Transportation

The ENF included a traffic study that generally conforms to the EEA/EOT Guidelines for Traffic Impact Assessment. Using the Institute of Traffic Engineers Trip Generation **land use code 820 - Shopping Center**, the project is estimated to generate a total of approximately 6,850 new vehicle trips on the average weekday. The traffic study addressed the proposed full build-out (Phase A and B) for the Shoppes at Harrington Farm project. The ENF includes the following proposed traffic mitigation measures:

- geometric modifications to widen the southbound approach to the Route 9/South Street intersection to provide an exclusive left-turn lane, a shared through/left-turn lane, a shared through left-turn lane, and an exclusive right-turn lane;

- geometric modifications to widen the westbound approach to the Route 9/South Street intersection to provide an exclusive right-turn lane, two thru lanes and an exclusive left-turn lane; and,

- traffic signal phasing and timing modifications for the Route 9/South Street intersection.

In their comments, MassHighway has recommended that the proponent extend the traffic study area to include the Boylston Street/Grafton Street (Route 140)/Main Street intersection. The DEIR should include a revised capacity analysis for the Route 9/South Street intersection that documents the actual value to traffic operations from any proposed mitigation. MassHighway has requested that the proponent also review the project's impacts to the signalized Main Street/South Street intersection and propose appropriate mitigation. The DEIR must respond to the comments received from MassHighway.

The DEIR should discuss the suitability of any signalization improvements and any roadway widening, and a traffic signal warrant analysis for any proposed traffic signals. It should discuss right-of-way (ROW) implications of possible widening and describe how such ROW's would be acquired. Any plans for the major reconstruction of the roadways in the study area should be discussed in the DEIR. The DEIR should describe how the proponent's proposed mitigation plan will accommodate each phase of the project.

The DEIR should identify the proponent's coordination efforts with local area neighborhoods, proponents of other project area developments, MassHighway, the Town of Shrewsbury and the Central Massachusetts Regional Planning Commission (CRMPC). The proponent must work closely with MassHighway's Public/Private Development Unit and the District 3 Office, and to successfully resolve design issues for the overall traffic mitigation plan proposed for the project.

Transportation Demand Management (TDM) Plan

The DEIR should include a proposed Transportation Demand Management (TDM) plan for employees and patrons of the Shoppes at Harrington Farms project. The proponent's proposed TDM plan should consider incorporating measures for reducing project generated vehicle trip generation including:

- the appointment of an Employee Transportation Coordinator (ETC);
- the use of staggered employee work hours;
- the implementation of an employee ride-matching program (carpooling and vanpooling) program;
- the implementation of a "Guaranteed Ride Home" program for employees;
- work closely with the Worcester Regional Transit Authority (WRTA), the Town of Shrewsbury and others to extend existing bus service (Route #15) and/or alternate transportation to the project site;
- promote the use of on-site amenities including employee direct deposit banking;
- install bicycle amenities including secured bicycle storage racks at each building;
- bicycle shoulders along site driveways; and,
- construct sidewalks along site driveways and along South Street and Route 9.

All project tenants and businesses should be required to participate in the proposed TDM plan. The TDM plan should describe any monitoring necessary to ensure the success of the program. The DEIR should demonstrate the proponent's commitment to implement, monitor, and continuously fund a proposed TDM plan.

Transit

The proponent should continue discussions with the Worcester Regional Transit Authority (WRTA), and any other transit providers, and local area businesses in Shrewsbury to identify opportunities for providing curb-to-curb WRTA transit service, and car/vanpool service to the project site. I strongly encourage the proponent to identify opportunities to incorporate transit amenities including bus shelters and bus stops in closer proximity to proposed buildings to be located within the project site. The DEIR should include an update of the proponent's discussions with WRTA and others for providing existing MBTA bus service to the project site.

Pedestrian and Bicycle Facilities

The DEIR should describe the internal vehicular and pedestrian circulation plan for the project site at the completion of the proposed project. The DEIR should show on a reasonable scaled map of the project site, where the proponent proposes new sidewalks, pedestrian crossings and vehicle/pedestrian safety signage. The proponent should discuss the feasibility of providing a sidewalk along the project's site driveways, and along the east side of South Street and north side of Route 9.

I strongly encourage the proponent to continue to evaluate the feasibility of traffic, transit, pedestrian, and bicycle improvements within the project area in response to the regional and local traffic concerns that may arise out of the proposed mixed-use development project.

Greenhouse Gas Emissions Policy and Protocol

This project is subject to the EEA Greenhouse Gas Emissions Policy and Protocol, and the DEIR must demonstrate consistency with the analysis and mitigation provisions therein. The Policy is available on-line at http://www.mass.gov/envir/mepa/pdffiles/misc/GHG%20Policy%20FINAL.pdf.

The proponent should calculate and compare GHG emissions associated with:1) a code-compliant baseline (the sum of direct emissions from stationary sources and indirect emissions from energy consumption and transportation); 2) the preferred alternative (the sum of direct emissions from stationary sources, indirect emissions from energy consumption, and transportation for the project as proposed); and 3) project alternatives with greater GHG emissions-related mitigation than the preferred alternative. When comparing the preferred project alternative to other alternatives with greater GHG reduction, the proponent should explain which alternatives were rejected, and the reasons for rejecting them. The GHG alternatives analysis should clearly demonstrate consistency with the objectives of MEPA review, one of which is to document the means by which the proponent plans to avoid, minimize or mitigate damage to the environment to the maximum extent feasible. The proponent should fully explain any trade-offs inherent in the evaluation of GHG reduction measures, such as increased impacts on some resources to avoid impacts to other resources. I note that the proponent is required to quantify mitigation benefits. The Appendix to the Policy contains a partial, non-exhaustive list of measures to reduce GHG emissions and incorporate sustainable development techniques.

Wetlands

According to the information provided in the ENF submittal document, the project will result in permanent impacts to approximately 4,438 sf of Bordering Vegetated Wetlands (BVW) to accommodate the construction of one of two retail buildings (Building "B") in Phase A, and the proposed internal roadway wetlands crossing to connect the Phase A and Phase B developments. As illustrated in the project site plan included in the ENF, the project will also result in the alteration of the 100 ft wetlands buffer area resulting from site grading and roadway construction, buildings, and stormwater management infrastructure. The DEIR should identify the 100ft wetlands buffer area and describe the project's impacts to wetland buffer.

In their comments, the MassDEP has indicated that under the currently proposed project design, a significant portion of Building B is located within BVW and will result in the isolation and subsequent loss of BVW within the project site in excess of 5,000 sf. According to MassDEP, the proposed project does not appear to meet the performance Standards under the Wetlands Protection Regulations pursuant to 310 CMR 10.55 (4)(b). The proponent should respond to MassDEP's comments.

The DEIR should include an analysis of design alternatives to avoid, minimize and mitigate impacts to BWV resource areas. The proponent should also examine methods of avoiding or minimizing encroachment into the 100-foot wetland buffer area.

As described in the ENF, on November 11, 2007, the Shrewsbury Conservation Commission issued an Order of Resource Area Delineation indicating that the project site contains additional BVW resource area located within the western half (Phase A) portion of the property and protected under the Wetlands Protection Act. As currently proposed, the proponent's preferred development scenario involves the elimination of this additional wetland resource area. Questions regarding the jurisdictional status of this wetland resource area are included in the proponent's appeal currently before the Division of Administrative Law Appeals (DALA).. The

The Wetland Section of the DEIR should contain an alternatives analysis to ensure that all wetland impacts are avoided, and where unavoidable impacts occur, impacts are minimized and mitigated. The DEIR should provide an accurate measurement of the wetland resource areas that will be affected by the project. The DEIR should include a reasonably scaled plan that accurately depicts all wetlands resource areas that have been delineated in the field, surveyed and mapped. The DEIR should incorporate DALA's findings and determination into a preferred development scenario design. In the event that the proponent elects to submit the DEIR document prior to DALA's decision, the DEIR should further evaluate one alternative development scenario that maintains the additional wetland resource area as a BVW resource area, along with a development scenario that proposes to remove the existing additional wetland resource area. The DEIR should contain additional information for MassDEP to evaluate the proponent's efforts to avoid or minimize the potential environmental impacts resulting from each proposed development alternative. The DEIR should discuss the consistency of the proponent's alternative development scenarios with any Variance requirements under the Wetlands Protection Act (310 CMR 10.05 (10) or the Variance provisions of the 401 Water Quality Certification for Fill Projects in Waters and Wetlands pursuant to section 314 CMR 9.08. The proponent should consult with the Shrewsbury Conservation Commission and MassDEP to investigate alternative site designs and layouts that maximize undisturbed buffers around wetland resource areas.

For any amount of required wetlands replication, a detailed wetlands replication plan should be provided in the DEIR that, at a minimum, includes: replication location(s) delineated on plans, a list of wetlands plant species of areas to be altered and the proposed wetland replication species, planned construction sequence, and a discussion of the required performance standards and monitoring. MassDEP is recommending a replication rate greater than 1:1.

Stormwater

According to the proponent, the proposed commercial retail project's stormwater management system has been designed to comply with MassDEP's Stormwater Management Policy and Guidelines and will incorporate the use of hooded deep sump catch basins to convey stormwater runoff to one or more on-site underground detention basins.

The DEIR should include a detailed description of the proposed project's stormwater management plan. It should be demonstrated that source controls, pollution prevention measures, erosion and sediment controls, and the post-development drainage system will be designed in compliance with MassDEP's Stormwater Management Policy (SMP), and the revisions, which will be incorporated into the wetlands and 401 Water Quality Certification regulations on January 2, 2008. The DEIR also should explain how water quality and quantity impacts would be controlled in compliance with the stormwater standards. The Proponent should use the MassDEP Stormwater Management Handbook when addressing this issue.

The DEIR should demonstrate that the design of the drainage system is consistent with this policy's standards for water quality, recharge to groundwater, and peak runoff impacts, and with the Town of Shrewsbury's Storm Water Program and its National Pollutant Discharge Elimination System (NPDES) Phase II Stormwater Construction General Permit (CGP). If the proponent ties into an existing municipal stormwater system or the MHD system, the DEIR should clarify the permits required and if there will be a recharge deficit on-site. In addition, a maintenance program for the proposed drainage system will be needed to ensure its effectiveness. This maintenance program should outline the actual maintenance operations, sweeping schedule, responsible parties, and back-up systems. The DEIR should investigate feasible methods of reducing the project's impervious surfaces to increase the points of infiltration within the project site.

I note that new Stormwater Management regulations have been promulgated, effective January 2, 2008, that require the proponent to evaluate sustainable design alternatives such as Low Impact Development (LID) techniques in site design and stormwater management plans. LID techniques incorporate stormwater best management practices (BMPs) and can reduce impacts to land and water resources by conserving natural systems and hydrologic functions. The primary tools of LID are landscaping features and naturally vegetated areas, which encourage detention, infiltration and filtration of stormwater on-site. Other tools include water conservation and use of pervious surfaces. Clustering of buildings is an example of how LID can preserve open space and minimize land disturbance. LID can also protect natural resources by incorporating wetlands, stream buffers and mature forests as project design features. For more information on LID, visit http://www.mass.gov/envir/lid/. Other LID resources include the national LID manual (Low Impact Development Design Strategies: An Integrated Design Approach), which can be found on the EPA website at: http://www.epa.gov/owow/nps/lid/.

Water Supply

The potable and fire protection water supply needs for the Shoppes at Harrington Farms project (approximately 11,000 gpd) will be served by the Town of Shrewsbury's municipal water supply system. As described in the ENF, the water supply for the project's proposed irrigation system will be provided by the proponent's proposed construction of new on-site private wells. The DEIR should include a description of the proposed irrigation system for the project. I strongly encourage the proponent to incorporate water conservation and water use efficiency in the project design to comply with the March 1989 state plumbing code.

Specifically, the proponent should commit to employing efficient commercial water conservation technologies for the project including water saving devices, low flow toilets, and low flow appliances (dishwashers, washing machines).

Wastewater

As described in the ENF, the project's wastewater flows (11,000 gpd) will be conveyed from the project site via Shrewsbury's sewer collection system to the City of Westborough's wastewater treatment facility (WWTF) for treatment and disposal to the Assabet River.

Construction Period Impacts

The DEIR should include a construction mitigation plan to satisfactorily address the project's potential impacts to local businesses and nearby residential neighborhoods from construction-related project impacts including traffic, noise and dust. I strongly encourage the proponent to consult with MassDEP, and the Town of Shrewsbury, and to meet with local area residential neighbors from the project area during the design of the proponent's construction mitigation plan. I ask that the proponent consider requiring its contractors to use On-Road Low Sulfur Diesel (LSD) fuel in their off-road construction equipment that can increase the removal of particulate matter (PM) by approximately 25% beyond that which can be removed by retrofitting diesel-powered equipment. All construction-related refueling and equipment maintenance activities should be conducted under cover on impervious surface areas with containment, and outside of any wetlands resource areas, endangered species habitat areas, residential areas and wellhead protection areas. The proponent should also commit to specific TDM measures that can be implemented during construction.

Mitigation/Section 61

The DEIR should include a separate chapter on mitigation measures. It should develop transportation and parking demand management measures to reduce single passenger automobile trips to the project and encourage ridesharing to the site by employees. The DEIR should include any conceptual plans for roadway improvements with sufficient detail to verify the feasibility of constructing such improvements. The plans should show proposed lane widths and offsets, layout lines and jurisdictions, and the land uses (including access drives) adjacent to areas where improvements are proposed. The DEIR should state whether land takings are necessary to implement proposed improvements and should identify the party responsible for such takings. Any proposed mitigation within the state highway layout must conform to MHD standards, including but not limited to, lane, median and shoulder widths, bicycle lanes and sidewalks.

This chapter on mitigation should include a Draft Section 61 Finding for all state permits. The Draft Section 61 Finding should contain a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation, and the identification of the parties responsible for implementing the mitigation.

A schedule for the implementation of mitigation, based on the proposed construction phases of the project and approved by MassHighway, should also be included. I urge the proponent to participate in any discussions and studies, which evaluate the feasibility of traffic, transit, pedestrian, and bicycle improvements within the project area.

Comments

The DEIR should respond to the comments received to the extent that they are within MEPA jurisdiction and present any additional narrative or quantitative analysis necessary to respond to the comments received.

Circulation

The DEIR should be circulated to all who submitted commented on the ENF as listed below, to the Town of Shrewsbury, to any agency from which the proponent may require a permit or approval, and to others as required by Section 11.16 of the MEPA regulations. A copy of the DEIR should also be made available for public review at the Shrewsbury Public Library.

January 23, 2008
DATE

Ian A. Bowles, Secretary

Comments Received

01/10/08 Department of Environmental Protection (MassDEP) – CERO
01/14/08 Executive Office of Transportation (MassHighway)

IAB/NCZ/ncz
EEA #14150

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June 13, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS ON THE DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: The Shoppes at Harrington Farms
PROJECT MUNICIPALITY	: Shrewsbury
PROJECT WATERSHED	: Sudbury
EEA NUMBER	: 14158
PROJECT PROPONENT	: Retailscapes, LLC
DATE NOTICED IN MONITOR	: May 7, 2008

The Secretary of Energy and Environmental Affairs hereby determines that the Draft Environmental Impact Report (DEIR) submitted on the above project **adequately and properly complies** with the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00).

Project Summary

The design program for the Shoppes at Harrington Farms project was modified subsequent to the Secretary's January 23, 2008 issuance of the Certificate on the Environmental Notification form (ENF) resulting in decreased impacts to wetland resource areas and minor increases to traffic generation, surface parking, water use and wastewater generation. As currently designed, the project now includes the two-phased development (Phase I, II) of approximately 113,000 square feet (sf) of supermarket, restaurant and retail space in three separate buildings on a 24.80-acre site located on Route 9 and South Street in Shrewsbury. Phase I of the project will involve the construction of a 64,454 sf supermarket and 258 surface parking spaces. Phase II will include the construction of a 42,084 sf commercial retail building, a stand-alone 6,500 sf (200 seat) restaurant building and 223 surface parking spaces. The two-phased project will generate approximately 7,281 new average daily trips (adt).

Potable water use and wastewater generation is estimated in the DEIR at 15,356 gallons per day (gpd) and will be served by the Town of Shrewsbury. The project will result in the creation of approximately 8.5 acres of new impervious area. The Proponent proposes one site drive on South Street and two separate site drives on Route 9. The project's internal roadway plan calls for a wetland crossing to connect the Phase I and Phase II developments.

Permits and MEPA Jurisdiction

The project is undergoing MEPA review and is subject to a mandatory EIR pursuant to Section 11.03(6)(a)(6) because it involves generation of 3,000 or more new average daily trips (adt) on roadways providing access to a single location. The project is also undergoing MEPA review pursuant to Section 11.03(6)(b)(15) because it will result in the construction of 300 or more new parking spaces at a single location. The project requires a Vehicle Access Permit from the Massachusetts Highway Department (MassHighway) for access to Route 9, and a U.S. Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Permit for stormwater discharges from a construction site of over one acre. The project will require a Section 401 Water Quality Certificate from the Department of Environmental Protection (MassDEP). The project may require a Section 404 Programmatic General Permit (Category II) from the U.S. Army Corps of Engineers (USACOE). A Superseding Order of Resource Area Delineation was issued by MassDEP on May 5, 2008. The Proponent must file a Notice of Intent (NOI) with the Shrewsbury Conservation Commission for work within a resource area. The Proponent has included in the DEIR an air quality mesoscale analysis for ozone to assess the total volatile organic compounds (VOC) and nitrogen oxides (NOx) emissions associated with all project-related vehicle trips.

The Proponent is not seeking financial assistance from the Commonwealth. Therefore, MEPA jurisdiction applies to those aspects of the project within the subject matter of required, or potentially required, state permits that have the potential to cause damage to the environment as defined in the MEPA regulations. In this case, MEPA jurisdiction extends to transportation, wastewater, wetlands and stormwater.

Transportation

The DEIR includes a traffic study that generally conforms to the EEA/EOT Guidelines for Traffic Impact Assessment. Using the Institute of Traffic Engineers Trip Generation land use code 820 - Shopping Center, the project is estimated to generate a total of approximately 7,281 new vehicle trips on the average weekday. The traffic study addressed the proposed full build-out for the Shoppes at Harrington Farm project. The DEIR includes the following proposed traffic mitigation measures:

- geometric modifications to widen the southbound approach to the Route 9/South Street intersection to provide an exclusive left-turn lane, a shared through/left-turn lane, a shared through left-turn lane, and an exclusive right-turn lane;

- geometric modifications to widen the westbound approach to the Route 9/South Street intersection to provide an exclusive right-turn lane, two through lanes and an exclusive left-turn lane; and,

- traffic signal phasing and timing modifications for the Route 9/South Street intersection.

In its comments, MassHighway has recommended that the Proponent provide a pedestrian crosswalk and a phased signal to connect the existing apartment complex located on the southwest corner of the on Route 9/South Street intersection to the proposed retail development project. The FEIR should include an analysis of signal phasing and timing changes for the Boylston Street/Grafton Street (Route 140)/Main Street intersection to improve traffic operations at this intersection under full-build conditions. The Proponent should also examine the feasibility of re-striping the Main Street eastbound approach to provide an exclusive right-turn lane for the Main Street/South Street intersection.

The FEIR should identify the Proponent's coordination efforts with local area neighborhoods, proponents of other development projects in the area, MassHighway, the Town of Shrewsbury and the Central Massachusetts Regional Planning Commission (CRMPC). The Proponent should continue to work closely with MassHighway's Public/Private Development Unit and the District 3 Office, to successfully resolve design issues for the overall traffic mitigation plan proposed for the project.

Transportation Demand Management (TDM) Plan

The DEIR includes a description of the Proponent's proposed Transportation Demand Management (TDM) plan proposed for the project and includes:

- the appointment of an Employee Transportation Coordinator (ETC);
- promote the use of on-site amenities including on-site banking and employee direct deposit banking;
- install bicycle amenities including secured bicycle storage racks at each building;
- work closely with the Worcester Regional Transit Authority (WRTA), the Town of Shrewsbury and others to extend existing bus service (Route #15) and/or alternate transportation to the project site;

The FEIR should identify additional TDM measures for employees and patrons aimed at further reducing project-generated traffic including, but not limited to:

- the use of staggered employee work hours;
- the implementation of an employee ride-matching program (carpooling and vanpooling) program;
- the implementation of a "Guaranteed Ride Home" program for employees;
- bicycle shoulders along site driveways; and,
- construct sidewalks along site driveways and along South Street and Route 9.

The FEIR should provide additional information pertaining to the Proponent's commitment to construct a bus shelter/taxi stand within the project site. All project tenants and businesses should be required to participate in the proposed TDM plan. The TDM plan should describe any monitoring necessary to ensure the success of the program. The FEIR should demonstrate the Proponent's commitment to implement, monitor, and continuously fund a proposed TDM plan.

Transit

The Proponent should continue discussions with the Worcester Regional Transit Authority (WRTA), and any other transit providers, and local area businesses in Shrewsbury to identify opportunities for providing curb-to-curb WRTA transit service, and car/vanpool service to the project site. I strongly encourage the Proponent to identify opportunities to incorporate transit amenities, including bus shelters and bus stops, in closer proximity to proposed buildings to be located within the project site. The FEIR should include an update of the Proponent's discussions with WRTA for providing existing bus service to the project site.

Pedestrian and Bicycle Facilities

As illustrated in site plans provided in the DEIR, the Proponent has committed to construct sidewalks along the South Street site drive and along a portion (approximately 450 feet) of South Street from the South Street/Site Drive intersection to the South Street/Route 9 intersection. The FEIR should describe the internal vehicular and pedestrian circulation plan for the project site at the full-build completion of the project. The FEIR should show on a reasonable scaled map of the project site, where the Proponent proposes new internal sidewalks, pedestrian crossings and vehicle/pedestrian safety signage. The Proponent should discuss the feasibility of providing a sidewalk along each of the project's proposed three site driveways, along the proposed internal roadway connecting the Phase I and Phase II developments, and along the north side of Route 9. I strongly encourage the Proponent to continue to evaluate the feasibility of traffic, transit, pedestrian, and bicycle improvements within the project area in response to the regional and local traffic concerns that may arise out of the proposed mixed-use development project.

Greenhouse Gas Emissions Policy and Protocol

The proposed project is subject to EEA's Greenhouse Gas (GHG) Emissions Policy that requires Proponents to quantify project-related GHG emissions and propose and quantify the impact of mitigation measures to reduce GHG emissions. The Proponent submitted the results of the GHG analysis with the DEIR. In the analysis, the Proponent calculated GHG emissions from both mobile sources and direct and indirect stationary sources. While the project is in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used.

Direct and indirect carbon dioxide (CO_2) emissions from the proposed direct and indirect building sources were calculated using the Tech Environmental Energy Model. CO_2 emissions produced by the project-generated vehicle trips were analyzed using the EPA MOBILE 6.2 Source Emission Factor Model. The Proponent evaluated the change in CO_2 emissions from project-related traffic and proposed building/energy consumption sources for the 2007 Existing, the 2012 No-Build, the 2012 Build and the 2012 Build with Improvements Conditions. As presented in the DEIR, total CO_2 emissions in the Build Condition are expected to increase by 7,503.5 tons per year (tpy) from the No-Build Condition. With proposed mitigation measures in place, CO_2 emissions are estimated to be reduced by 1,109.1 tpy, a 14.8% reduction.
In order to achieve the gains proposed and meet the intent of the Protocol, the FEIR should reflect in its draft Section 61 Findings the commitments the Proponent intends to implement.

The Division of Energy Resources (DOER) reviewed the DEIR and notes that in general, the Proponent's energy model must be optimized for the Massachusetts Building Code, which is the baseline alternative for energy usage in calculating GHG emissions, as explained in the Greenhouse Gas Emissions Policy and Protocol. DOER also recommends that the Proponent contact the New Construction division of its natural gas provider, NStar, and its municipal electric utility provider in Shrewsbury to take advantage of any potential rebates available for the installation of highly energy-efficient equipment. Consistent with the GHG Policy the FEIR should model at least one mitigation alternative that would result in greater GHG reductions than the preferred alternative. Alternatives with greater energy efficiencies allow an understanding of potential opportunities for energy savings achievable by varying building design and layout strategies. Energy efficient techniques not selected should be explained, and this information will assist in the determination that the alternative selected has avoided, minimized, and mitigated CO_2 emissions. The Appendix to the EEA Greenhouse Gas Emissions Policy contains a partial, non-exhaustive list of measures to reduce GHG emissions and incorporate sustainable development techniques. When comparing the preferred alternative to other alternatives with greater GHG reduction, the FEIR should explain which alternatives were rejected, and the reasons for rejecting them. The Proponent should fully explain any trade-offs inherent in the evaluation of GHG reduction measures, such as increased impacts on some resources to avoid impacts to other resources. The alternatives analysis should clearly demonstrate consistency with the objectives of MEPA review, one of which is to document the means by which the Proponent plans to avoid, minimize or mitigate damage to the environment to the maximum extent feasible.

The Proponent is required to quantify mitigation benefits. The DOER has commented that the GHG mitigation information provided in the DEIR is not conducive to analysis or input because it only checks off mitigation measures as technically infeasible or inappropriate to project type without explanation, particularly on techniques such as building orientation, renewable energy sources and green roofs, each of which can be very site adaptable. Although it is unnecessary to provide a complete technological and financial analysis of all GHG reduction mitigation measures, it will benefit the Proponent to use functional and quantitative analyses and mock ups to assess feasible greenhouse gas reduction measures for this project, starting with measures that offer the greatest energy reductions, and then considering opportunities to improve ongoing operations.

These assessments can inform an analysis of the feasibility of LEED and/or Energy Star elements; for those elements not selected, the EIR must do a credible job in explaining why a particular efficiency or green power generation component is impracticable. For example, the EIR should consider the feasibility of implementing alternative energy sources for the project and/or purchasing power generated by renewable energy sources for any portion of the electricity use on the site. LEED certification for New Construction/Retail requires a 35 percent to 50 percent contribution of green power. Even if on-site power generation is not feasible, many projects now routinely commit to orienting and designing buildings for energy efficiency, and this project has proposed to incorporate lighting improvements, duct insulation, programmable thermostats, duct insulation, and a cool roof design. Other energy efficient measures, as explained below, also should be considered. Additional information on building design energy reduction measures and standards is available on many websites, including the following: http://www.eere.energy.gov/, http://www.nahb.org, www.sbicouncil.org, http://www.aceee.org, http://www.ashrae.org/, http://www.coolroofs.org/ and http://www.ornl.gov.

The DOER has identified several measures in the comment letter worthy of consideration in the subsequent filing, and adoption into the project, where feasible. In the event that the Proponent is not able to adopt one of these measures, the FEIR should provide technical and cost analyses to document the rationale for not making a commitment to a mitigation recommendation. The Proponent's energy model must be optimized for the MA Building Code, which is the baseline alternative for energy usage in calculating GHG emissions, as explained in the MEPA Greenhouse Gas Emissions Policy and Protocol. Also, DOER recommends that the Proponent contact the New Construction division of its electricity utility in Quincy, NStar, and its natural gas utility, National Grid, to take advantage of potential rebates available for the installation of highly energy efficient equipment.

The proponent should provide a detailed response to the comment letter submitted by DOER dated June 9, 2008. I hereby incorporate by reference the additional requests for information contained in that letter as part of the scope of the FEIR.

Wetlands

According to the comments received from MassDEP on the DEIR, the Proponent has modified the site plan design to relocate Building B outside of wetlands jurisdictional areas to reduce the project's wetlands impacts from more than 5,000 sf to approximately 4,600 sf. As described in the DEIR, the project will result in permanent impacts to approximately 4,6258 sf of Bordering Vegetated Wetlands (BVW) to accommodate the construction of an internal roadway connection between the Phase I and Phase II portions of the project site. The project will also result in the alteration of approximately 4.13 acres of the 100-foot wetlands buffer area resulting from site grading and roadway construction, buildings, and stormwater management infrastructure.

I note that on November 11, 2007, the Shrewsbury Conservation Commission issued an Order of Resource Area Delineation indicating that the project site contains additional BVW resource area located within the western half (Phase I) portion of the property and protected under the Wetlands Protection Act. Questions regarding the jurisdictional status of this wetland resource area were appealed by the Proponent to the Division of Administrative Law Appeals (DALA). MassDEP has recently determined that the additional BVW resource area is non-jurisdictional and has issued the Proponent a Superseding Order of Resource Area Delineation.

Stormwater

According to the Proponent, the proposed stormwater management system for the commercial retail project has been designed to comply with MassDEP's recently revised Stormwater Management Policy (SMP). As designed, the stormwater management system will incorporate the use of hooded deep sump catch basins to convey stormwater runoff to one on-site open detention basin and one underground detention basin. I note that new Stormwater Management regulations have been promulgated, effective January 2, 2008, that require the Proponent to evaluate sustainable design alternatives such as Low Impact Development (LID) techniques in site design and stormwater management plans. LID techniques incorporate stormwater best management practices (BMPs) and can reduce impacts to land and water resources by conserving natural systems and hydrologic functions.

The primary tools of LID are landscaping features and naturally vegetated areas, which encourage detention, infiltration and filtration of stormwater on-site. Other tools include water conservation and use of pervious surfaces. Clustering of buildings is an example of how LID can preserve open space and minimize land disturbance. LID can also protect natural resources by incorporating wetlands, stream buffers and mature forests as project design features. For more information on LID, visit http://www.mass.gov/envir/lid/. Other LID resources include the national LID manual (Low Impact Development Design Strategies: An Integrated Design Approach), which can be found on the EPA website at: http://www.epa.gov/owow/nps/lid/.

Water Supply

The potable and fire protection water supply needs for the project (approximately 11,000 gpd) will be served by the Town of Shrewsbury's municipal water supply system. As described in the DEIR, the water supply for the project's proposed irrigation system will be provided by the Proponent's proposed construction of new on-site private wells. I continue to strongly encourage the Proponent to incorporate water conservation and water use efficiency in the project design to comply with the March 1989 state plumbing code. Specifically, the Proponent should commit to employing efficient commercial water conservation technologies for the project including water saving devices, low flow toilets, and low flow appliances (e.g. dishwashers, washing machines).

Wastewater

The project's wastewater flows (15,356 gpd) will be conveyed from the project site via Shrewsbury's sewer collection system to the City of Westborough's wastewater treatment facility (WWTF) for treatment and disposal to the Assabet River.

Construction Period Impacts

The FEIR should include a construction mitigation plan to satisfactorily address the project's potential impacts to local businesses and nearby residential neighborhoods from construction-related project impacts including traffic, noise and dust. I strongly encourage the Proponent to consult with MassDEP, and the Town of Shrewsbury, and to meet with local area residential neighbors from the project area during the design of the Proponent's construction mitigation plan. I ask that the Proponent consider requiring its contractors to use on-road low sulfur diesel (LSD) fuel in their off-road construction equipment that can increase the removal of particulate matter (PM) by approximately 25 percent beyond that which can be removed by retrofitting diesel-powered equipment. All construction-related refueling and equipment maintenance activities should be conducted under cover on impervious surface areas with containment, and outside of any wetlands resource areas, endangered species habitat areas, residential areas and wellhead protection areas. The Proponent should also commit to specific TDM measures that can be implemented during construction.

Mitigation/Section 61

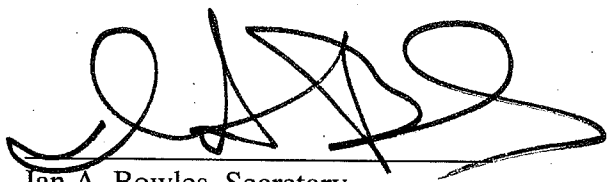
The FEIR should include a separate chapter on mitigation measures. It should develop transportation and parking demand management measures to reduce single passenger automobile trips to the project and encourage ridesharing to the site by employees. The FEIR should include any conceptual plans for roadway improvements with sufficient detail to verify the feasibility of constructing such improvements. The plans should show proposed lane widths and offsets, layout lines and jurisdictions, and the land uses (including access drives) adjacent to areas where improvements are proposed. The FEIR should state whether land takings are necessary to implement proposed improvements and should identify the party responsible for such takings. Any proposed mitigation within the state highway layout must conform to MassHighway standards, including but not limited to, lane, median and shoulder widths, bicycle lanes and sidewalks. This chapter on mitigation should include a draft Section 61 Finding for all required state permits. The Draft Section 61 Finding should contain a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation, and the identification of the parties responsible for implementing the mitigation. A schedule for the implementation of mitigation, based on the proposed construction phases of the project and approved by MassHighway, should also be included. I urge the Proponent to participate in any discussions and studies, which evaluate the feasibility of traffic, transit, pedestrian, and bicycle improvements within the project area.

Comments

In order to ensure that the issues raised by commenters are addressed, the FEIR should include a response to comments. This directive is not intended to, and shall not be construed to enlarge the scope of the FEIR beyond what has been expressly identified in the initial scoping certificate or this certificate.

Circulation

The FEIR should be circulated to all who submitted commented on the ENF as listed below, to the Town of Shrewsbury and the City of Westborough, to any agency from which the Proponent may require a permit or approval, and to others as required by Section 11.16 of the MEPA regulations. A copy of the FEIR should also be made available for public review at the Shrewsbury and Westborough Public Libraries.



June 13, 2008
DATE

Ian A. Bowles, Secretary

Comments Received

06/09/08	Department of Environmental Protection (MassDEP) – Boston
06/10/08	Department of Environmental Protection (MassDEP) – CERO
06/12/08	Executive Office of Transportation (MassHighway)

IAB/NCZ/ncz
EEA #14150 DEIR

EEA 14158

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

To: Nick Zavolas
From: Philip Weinberg
Re: MassDEP/DOER Comments on Harrington Farms GHG
Date: 6/6/08

Set out below are the combined comments of MassDEP and DOER on the sections of the Harrington Farm DEIR that address the Greenhouse Gas Policy:

Although it is unnecessary to provide a complete technological and financial analysis of all GHG reduction mitigation measures, it will benefit the proponent to use functional and quantitative analyses and mock ups to assess feasible greenhouse gas reduction measures for the project type, starting with measures that offer the greatest energy reductions, and then considering opportunities to improve ongoing operations. These assessments should either lead to commitments to adopt the LEED and/or Energy Star elements, or the EIR should do a credible job in explaining why a particular efficiency or green power generation component is impracticable. Since there is, for example, no demonstration in the DEIR that it would be technically infeasible or cost prohibitive to incorporate solar (photovoltaic) power on-site to generate energy for some of the building's functions, the EIR should consider the feasibility of implementing this technology.

Even if on-site power generation is not feasible, many projects now routinely commit to orienting and designing buildings for energy efficiency, and this project has proposed to incorporate energy efficient lighting, increased roof and duct insulation, energy efficient windows, duct insulation, and high-albedo roofing materials. Additional information and other energy efficient measures, as explained below, also need further consideration. Additional information on building design energy reduction measures and standards is available on many websites, including the following: http://www.eere.energy.gov/, http://www.nahb.org,www.sbicouncil.org, http://www.aceee.org, http://www.ashrae.org/, http://www.coolroofs.org/ and http://www.ornl.gov.

Consistent with the GHG Policy (page 6), the EIR should model at least one mitigation alternative that would result in greater GHG reductions than the preferred alternative. Alternatives with greater energy efficiencies allow an understanding of potential opportunities for energy savings achievable by varying building design and layout strategies. Energy efficient

techniques not selected should be explained, and this information assists in the determination that the alternative selected has avoided, minimized, and mitigated CO_2 emissions.

The Division of Energy Resources (DOER) reviewed the DEIR and notes that in general, the proponent's energy model must be optimized for the MA Building Code, which is the baseline alternative for energy usage in calculating GHG emissions, as explained in the MEPA Greenhouse Gas Emissions Policy and Protocol. Also, it is recommended that the project proponent contact the New Construction division of its natural gas provider, NStar, and its Municipal electric utility provider in Shrewsbury to take advantage of any potential rebates available for the installation of highly energy efficient equipment.

The DEIR has provided general information regarding worthwhile mitigation measures for building design and operation. However, supporting information is required to evaluate whether or not the measures offer the greatest energy reduction potential. DOER has identified several measures worthy of consideration in the subsequent filing, and adoption into the project, where feasible, as detailed below. In the event that the proponent is not able to adopt one of these measures, the subsequent filing must provide technical and cost analyses to document the rationale for not making a commitment to a mitigation recommendation.

High-Efficiency HVAC Systems and Boiler units – The subsequent filing needs to provide more information regarding the HVAC system, including the heating system, for all of the building types. Without more information, it is not possible to evaluate whether or not the systems being proposed are highly efficient based on an Energy Efficiency Ratio (EER) of 11.0 for the HVAC system and "high-efficiency" boiler units. It should be noted that more efficient units provide definite economic benefits over the life of the system.

Energy Efficient Exterior Lighting – The DEIR notes that the project will use "efficient and directed" exterior lighting. The subsequent filing needs to provide more information to be able to determine if it is highly energy efficient.

Duct Insulation – The DEIR notes that insulation will be wrapped around the air supply ducts to reduce energy losses. Duct insulation is the baseline required by code. To enhance efficiency, the subsequent filing should note, and construction should reflect, that all ducts will be sealed with mastic, tested and then insulated, since duct leakage can be a major factor in energy losses.

Building Energy Management Systems - The DIER notes that energy performance of the building will be tracked. The EIR should note how this will be done.

Roof and Wall Insulation - The subsequent filing should evaluate using R-38 insulation rather than R-19 in the building walls and R-30 for the roof reported in the DEIR. In general, insulation is very cost effective, and contributes significantly towards a building envelope that has the potential to yield the largest energy savings for building operations.

Incorporate on-site renewable energy sources into projects – At a minimum, buildings should be oriented and roofs should be constructed to support the added weight of a solar photovoltaic (PV) system for potential installation during project construction or at a future date. The project

is commended for incorporating high-albedo roof materials into the project. It should be noted that a rooftop PV system operates even more efficiently, due to added reflectivity with high-albedo roofs. Considering the support of subsidies through the Commonwealth Solar and RPS programs, a life-cycle cost analysis should be done to evaluate the installation of a PV system during project construction under two scenarios: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party that will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. If neither of these scenarios is economically feasible at this time, the project should continue to consider the opportunity for installing PV at a future date and state their willingness to host a third-party owned PV array under a favorable power purchase agreement.

In addition, solar thermal is another potential way to incorporate renewable energy, in particular for the proposed restaurant. Given the steady hot water load required for a restaurant solar thermal could potentially offset the hot water load for the building.

In summary, the EIR needs to show that the preferred alternative would achieve significant reductions in GHG emissions with building designs, selection of building materials, and water and sewer infrastructure upgrades and efficiencies that reduce and/or offset the fossil fuel energy demand of the project. Revised GHG emissions modeling for this project should include for reconsideration the mitigation measures identified herein, in order to quantify the additional emissions reductions that are potentially achievable. In the event that the proponent is not able to adopt any of these measures, the EIR should provide technical and cost analyses to document the rationale for not making a commitment to a mitigation recommendation.

Materials Management

MassDEP would like to commend the applicant for a basic recognition of materials management within the EIR for The Shoppes at Harrington Farms in Shrewsbury. In order to address GHG emissions related to materials management, MassDEP would like the applicant to provide an additional GHG mitigation section on materials management after the transportation management section (4.3) and before the mitigation summary (4.4). In this additional section the applicant should quantify the GHG impacts of materials management during the project development and projected future operation. By quantifying these impacts, the applicant's GHG mitigation efforts related to materials management can be more clearly identified and targeted. MassDEP would like this quantification to help guide changes to the EIR that will provide a more comprehensive approach to materials management throughout the design, construction and operational phases of the project. There are a number of resources available to help quantify GHG impacts from more efficient materials management including:

EPA Warm Model: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html
Building Reuse Calculator: http://www.wastematch.org/calculator/calculator.htm

During the **design phase**, MassDEP requests the applicant address waste reduction, environmentally preferable materials use, and the need to design for the storage and collection of recyclables. In order to plan for waste reduction the applicant should consider implementing a waste prevention purchasing policy, which may include management options for reducing

shipping and packaging materials and managing excess materials, if necessary, through unused product return or donation.

MassDEP would like the applicant to provide more specific information on:

- the list of the environmentally preferred products to be used,
- the GHG impacts of using these materials, and
- an explanation for why it has been deemed infeasible to reuse building materials and/or to use rapidly renewable materials.

MassDEP commends the applicant on providing for the storage and collection of recyclables, but requests that more specific information be provided on the square footage of the proposed storage area and the type of materials expected to be stored and recycled. MassDEP recommends ensuring that the storage area will be sufficient to, at a minimum, manage waste materials that are currently prohibited from disposal in Massachusetts. A list of these materials can be found at http://www.mass.gov/dep/recycle/solid/regs0201.htm. MassDEP also requests that the applicant identify how hazardous materials that may be generated during operation (spent fluorescent bulbs, lubricants, and other hazardous materials) will be managed and stored.

During the **construction phase**, MassDEP would like the applicant's material management efforts to focus on material reuse and recycling. MassDEP requests the applicant commit to developing a construction waste management plan that ensures compliance with the Massachusetts Waste Bans and establishes a minimum reuse/recycling goal of 50%. MassDEP has demonstrated through pilot construction projects that this planning results in significant reductions in waste and cost savings for developers. Information and resources to assist in the development and implementation of a construction management plan can be found at http://www.mass.gov/dep/recycle/reduce/managing.htm#project.

During the **operations phase** the applicant should develop and implement a waste management plan to ensure compliance with the MassDEP Waste Bans. MassDEP offers a significant number of resources to assist in this area including planning tools, contracting language and lists of service providers (http://www.mass.gov/dep/recycle/reduce/assistan.htm#reduce). The waste management plan should establish a target recycling goal of over 50%. This level of recycling has been consistently achieved in similar projects with demonstrated operational cost savings and capital asset appreciation benefits.

Greenhouse Gas Emissions

This project is categorically included for the preparation of an environmental impact report and requires a Massachusetts Highway Department (MHD) access permit; therefore, the project is subject to the MEPA Greenhouse Gas Emissions Policy and Protocol. The EENF included a GHG analysis, which was reviewed by MassDEP and the Division of Energy Resources (DOER) in the Executive Office of Energy and Environmental Affairs. The EENF predicts that the project would achieve a rating of silver for Leadership in Energy and Environmental Design for New Construction and Major Renovations (LEED ND), which is currently a pilot program based on established LEED rating criteria. However, in the Urban Design Section 4, it is anticipated that only 20 to 30 percent of the square footage would be LEED certifiable, and that the project would strive to achieve, at a minimum, an energy efficiency improvement of 10 percent. This section of the EENF also mentions the possibility of incorporating solar and wind power generating facility to reduce the electric demand by about 5 percent. The use of green roofs and water reductions of about 20 percent also are proposed. With these measures, the project design is estimated to generate 20,734 tons per year of CO_2 emissions from stationary sources and 910.7 tons per year of CO_2 emissions from transportation-related sources. The energy efficiency components of the LEED certification are estimated to reduce CO_2 emissions from the base case for direct and indirect stationary sources by about 26.3 percent and 26.2 percent, respectively. Transportation-related sources are predicted to reduce CO_2 emissions by about 5.0 percent. The total CO_2 reduction from the base case is estimated at 25.6 percent.

A project at this early stage of development provides a multitude of opportunities for designing buildings and transportation management measures that reduce energy consumption and substitute renewable energy sources for fossil fuel sources. MassDEP/EEA-DOER believes green developments are a smart financial investment. With a growing market demand for facilities that have reduced carbon footprints, rents are being driven higher for the US Building Council's Leadership in Energy and Environmental Design (LEED) certified buildings and Energy Star buildings than rents for less energy-efficient buildings, and occupancy rates are reported to be higher by the CoStar Group[1], which released a study on rents, sales, and occupancy for energy efficient buildings in their commercial property database.

In a study from the New Buildings Institute (NBI), it was reported that building performance averages are 25-30 percent more efficient for LEED certified buildings than non-LEED buildings, and gold-platinum LEED rated buildings are 45 percent more efficient than the national average, which approaches the interim goals of Architecture 2030, (a non-profit organization dedicated to reducing GHG emissions by changing the way developments are planned, designed, and constructed). The NBI study also shows a good correlation between modeled and actual building performance, providing assurances to developers and regulators that these measures will be effective. Additional information on energy efficiency/renewable rating systems is available at a number of websites including: http://www.buildinggreen.com/, http://energystar.gov/, www.architecture2030.org/. For new construction, core and shell, and commercial interiors relating to LEED certified buildings, information is available on the

[1] The full study can be viewed at the CoStar Group Inc. website: http://www.costar.com/news/Article.aspx?id=D968F1E0DCF73712B03A099E0E99C679. CoStar Group Inc. is an information services organization serving commercial real estate in the United States and the United Kingdom.

following website: http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222. In addition, for a Massachusetts perspective, consultation with green building experts can be obtained through the Green Building Roundtable: http://www.greenroundtable.org, located in Boston.

Although it is unnecessary to provide a complete technological and financial analysis of all GHG reduction mitigation measures, it will benefit the proponent to use functional and quantitative analyses and mock ups to assess feasible greenhouse gas reduction measures for the project type, starting with measures that offer the greatest energy reductions, and then considering opportunities to improve ongoing operations. These assessments should either lead to commitments to adopt the LEED and/or Energy Star elements, or the EIR should do a credible job in explaining why a particular efficiency or green power generation component is impracticable. Since there is, for example, no demonstration in the EENF that it would be technically infeasible or cost prohibitive to incorporate solar (photovoltaic) power on-site to generate energy for some of the building's functions, the EIR should consider the feasibility of implementing alternative energy sources for the project. Alternatively, there is no analysis of or commitment to purchasing power generated by renewable energy sources for any portion of the electricity use on the site.

Even if on-site power generation is not feasible, many projects now routinely commit to orienting and designing buildings for energy efficiency, and to its credit, this project has proposed to incorporate energy efficient lighting, increased roof and duct insulation, energy efficient windows, duct insulation, and high-albedo roofing materials. Other energy efficient measures, as explained below, also need further consideration. Additional information on building design energy reduction measures and standards is available on many websites, including the following: http://www.eere.energy.gov/, http://www.nahb.org,www.sbicouncil.org, http://www.aceee.org, http://www.ashrae.org/, http://www.coolroofs.org/ and http://www.ornl.gov.

Consistent with the GHG Policy, the EIR should model at least one mitigation alternative that would result in greater GHG reductions than the preferred alternative. Alternatives with greater energy efficiencies allow an understanding of potential opportunities for energy savings achievable by varying building design and layout strategies. Energy efficient techniques not selected should be explained, and this information assists in the determination that the alternative selected has avoided, minimized, and mitigated CO_2 emissions.

DOER reviewed the EENF and notes that in general, the proponent's energy model must be optimized for the Massachusetts Building Code, which is the baseline alternative for energy usage in calculating GHG emissions, as explained in the MEPA Greenhouse Gas Emissions Policy and Protocol. Also, it is recommended that the project proponent contact the New Construction division of its natural gas and electricity utility in Lowell, National Grid, to take advantage of potential rebates available for the installation of highly energy efficient equipment.

DOER has identified several measures worthy of consideration in the subsequent filing, and adoption into the project, where feasible, as detailed below. In the event that the proponent is not able to adopt one of these measures, the subsequent filing must provide technical and cost

analyses to document the rationale for not making a commitment to a mitigation recommendation.

High-Efficiency HVAC Systems – The subsequent filing needs to provide more information regarding the HVAC system, including the gas heating system, for all of the building types. Without more information, it is not possible to evaluate whether or not the system being proposed is highly efficient based on an Energy Efficiency Ratio (EER) of 11.5. It should be noted that more efficient units provide definite economic benefits over the life of the system.

Energy Efficient Exterior Lighting – The EENF notes that the project will use "efficient and directed" exterior lighting. The subsequent filing needs to provide more information to be able to determine if it is highly energy efficient.

Duct Insulation – The EENF notes that insulation will be wrapped around the air supply ducts to reduce energy losses. Duct insulation is the baseline required by code. To enhance efficiency, the subsequent filing should note, and construction should reflect, that all ducts will be sealed with mastic, tested and then insulated, since duct leakage can be a major factor in energy losses.

Maximize Interior Daylighting – Table 6 of the EENF notes interior day lighting as inappropriate to the project. This should be revisited, noting that interior day lighting is currently being designed into office and retail spaces.

Third Party Building Commissioning – Table 6 of the EENF notes third party building commissioning as technically infeasible to the project. The Massachusetts Building Code requires building commissioning, but it should be performed by a third party to ensure the commissioning process is thorough and energy performance of the building is maximized.

Building Energy Management Systems - Table 6 of the EENF indicates that motion sensors in lighting and climate control and tracking energy performance of the building and development to maintain efficiency would be inappropriate for this project. Motion sensors and lighting controls should be installed in all non-residential spaces. In addition, to ensure that the energy systems function as designed long term, a strategy should be developed for monitoring energy performance of all buildings where the energy systems are centrally controlled, possible through a building management system. A building energy management system can incorporate basic energy saving measures such as lighting and climate control. A system for monitoring energy performance would be expected to pay for itself by eliminating potential inefficient building energy operations, such as simultaneous operation of heating and cooling systems in January.

The EENF also indicates that the project will meet LEED ND, which includes a commitment to meet Credit 2 for green construction and technology, and energy efficiency. Combined, the project will strive to demonstrate a ten percent improvement in building energy performance. However, these improvements cannot be demonstrated without a system or strategy in place for monitoring energy performance.

Roof and Wall Insulation - The subsequent filing should evaluate using R-38 insulation rather than R-30 in the building walls and R-19 for the roof reported in the EENF. In general, insulation

is very cost effective, and contributes significantly towards a building envelope that has the potential to yield the largest energy savings for building operations.

Incorporate on-site renewable energy sources into projects – The EIR needs to explain and provide plans for onsite renewables, because there appears to be contradictory information in Table 6 of the EENF, which indicates that on-site renewable energy sources are inappropriate for the project, and information that the project would achieve LEED ND with Credits 11 and 13 for solar orientation and on-site renewable energy sources, respectively. Credit 11 notes that "blocks" along the canal will be south facing and provided with passive and active solar strategies, and for Credit 13, the proponent hopes to incorporate solar and wind. This information is contradictory to the information in Table 6.

At a minimum, roofs for new buildings should be constructed to support the added weight of a solar photovoltaic (PV) system for potential installation during project construction or at a future date. The proponent is commended for incorporating high-albedo roof materials into the project. Due to added reflectivity with high-albedo roofs, rooftop PV system operates even more efficiently, Considering the support of subsidies through the Commonwealth Solar and RPS programs, a life-cycle cost analysis should be done to evaluate the installation of a PV system during project construction under two scenarios: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party that will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. If neither of these scenarios is economically feasible at this time, the project should continue to consider the opportunity for installing PV at a future date and state their willingness to host a third-party owned PV array under a favorable power purchase agreement.

Water-source heat pumps are another potential way to incorporate renewable energy into this project. Given the location of the site near the Lowell canals, a water-source heat pump could provide energy for heating and cooling of the buildings proposed.

Although the main sources of GHG associated with this proposed project include building heating and cooling, lighting, and vehicle travel to and from the proposed development, the energy required to provide potable water and treat wastewater also will be a source of GHG. To gain an understating of the correlation between water/wastewater volumes and energy use requirements, MassDEP has considered major utilities in the state and reviewed relevant research. For example, the Massachusetts Water Resources Authority (MWRA) estimates the average energy cost wastewater treatment at their Deer Island facility is 1.2 - 1.4 kWh/kgal. Similarly, a study of wastewater treatment plants in Wisconsin found that 1.5 kWh/kgal was required to treat wastewater in that state's wastewater treatment plants. This proposed development will generate approximately 97,320 gallons of wastewater per day or approximately 35,521,800 million gallons per year. Using an average energy cost of 1.3 kWh/kgal the project will require approximately 35,522 kWh over the course of a year. The project proponent should consider this additional energy use when proposing measures to mitigate the additional GHG emissions that will result from treating wastewater from this proposed project.

In addition, the MWRA estimates that treating and transporting drinking water at their John Carrol Water Treatment Plant requires 0.14 to 0.23 kWh/kgal. This is slightly less than the estimated 0.3 kWh/kgal required to treat and transport drinking water at the Worcester Water Filtration facility. As noted in the EENF, the proposed project will require 107,050 gallons of potable water per day, or 39,073,250 gallons per year. Using energy costs of about 0.2 kWh/kgal, approximately 21,410 kWh will be required to supply the proposed project with potable water annually. As with wastewater, the project proponent should consider this additional energy use when proposing measures to mitigate the additional GHG emissions that will result from providing potable water for this proposed project. Mitigation measures for water and wastewater may include improvements to the distribution systems for the public water supply to eliminate un-accounted for water losses and infiltration and inflow (I/I) removal from sewer mains, in addition to water conservation measures.

In summary, the EIR needs to show that the preferred alternative would achieve significant reductions in GHG emissions with building designs, selection of building materials, and water and sewer infrastructure upgrades and efficiencies that reduce and/or offset the fossil fuel energy demand of the project. Revised GHG emissions modeling for this project should include for reconsideration the mitigation measures identified herein, in order to quantify the additional emissions reductions that are potentially achievable. In the event that the proponent is not able to adopt any of these measures, the EIR should provide technical and cost analyses to document the rationale for not making a commitment to a mitigation recommendation.

#14158

street closures will be avoided to the extent possible with any necessary closures or reductions in lane use coordinated with the Massachusetts Highway Department and the Town of Shrewsbury Police Department and will be limited to off-peak periods. Traffic and pedestrian management plans will be generated by the contractor and submitted to the appropriate authorities prior to their implementation.

To mitigate the traffic and impacts associated with onsite construction, construction workers will be encouraged to carpool to the project site. Additionally, parking areas will be provided onsite throughout the duration of construction to minimize temporary impacts on surrounding properties. Site deliveries will be timed to avoid peak traffic periods. Additionally, the Contractor will be encouraged to participate in the DEP's Clean Construction Equipment Initiative and to use Low Sulfur Diesel (LSD) fuel in their off-road construction equipment. The Contractor will be directed to have all construction related refueling and equipment maintenance done under cover over impervious areas with containment and outside of any wetland or wetland buffer areas and away from the adjacent residential area.

1.6.13 Green House Gas Emissions

A mesoscale analysis contained in Section 4.0 assesses the change in Greenhouse Gas Emissions (GHG) associated with Project-related traffic relative to volatile organic compound (VOC) emissions and oxides of nitrogen (NOx) emissions. A greenhouse gas emissions analysis of Carbon dioxide (CO2) emissions was also performed for the proposed building components of the project and can be found in Appendix D. The mesoscale analysis in Section 4 and the Greenhouse gas emission analysis cover project related impacts to CO2, VOC, and NOx emissions.

As found in Appendix D, the greenhouse gas emissions analysis was performed for the project. Carbon dioxide (CO2) emissions were quantified for: (1) the base case and initial code-compliant Project design (the Preferred Alternative, and (2) the mitigation case and final Project design. This analysis uses the Tech Environmental Energy Model, which replicates the output of the EPA Energy STAR Target Finder using data and algorithms from the U.S. Department of Energy, Energy Information Administration (EIA), and the American Society of Heating, Refrigerating and Air-Conditioning Engineers. The final design includes mitigation measures that reduce the Project's direct and indirect energy-related emissions of CO2 by 22% and 23%, respectively.

CO2 emissions produced by Project vehicle trips were analyzed using the EPA MOBILE6.2 Mobile Source Emission Factor Model. Mitigation measures for transportation emissions include a number of transportation demand management (TDM) strategies for the Project described in Sections 3 and 4 of this DEIR. These measures will improve traffic operations, reduce Project generated vehicle trips, and reduce Project-related motor vehicle CO2 emissions by approximately 2.5%. Overall, mitigation measures in the final Project design are expected to reduce the Project's total CO2 emissions by 14.8%. Please refer to Appendix D for the complete Green House Gas Emissions report.

The Section 4 mesoscale air quality study was prepared in conformance with the Massachusetts Department of Environmental Protection (DEP) guidelines to

demonstrate that the Project will meet state and federal air quality requirements. The air

demonstrate that the Project will meet state and federal air quality requirements. The air quality study consists of a mesoscale (regional) analysis. The mesoscale analysis

assesses the change in Greenhouse Gas Emissions (GHG) associated with Project-related traffic. GHG's are defined as volatile organic compound (VOC) emissions and oxides of nitrogen (NOx) emissions. The analyses evaluated the existing and future year traffic conditions that are described in the March 2008 Traffic Impact and Access Study (TIAS) – EIR Transportation Component for the Project.

The mesoscale analysis predicts an increase in volatile organic compound (VOC) emissions under the Build condition of 18 kilograms per day (kg/day) when compared to the No-Build condition. Likewise, an increase in NOx emissions under the Build condition of 18 kg/day is estimated compared to the No-Build condition. As required by the DEP guidelines, project-related mitigation measures are included in the project to help reduce motor vehicle emissions within the study area. These measures include roadway and signal improvements and a Travel Demand Management (TDM) program as described in more detail under section 4.8, Mitigation.

TECH environmental
FOCUSED KNOWLEDGE. REAL SOLUTIONS.

August 29, 2008

Mr. John Kucich, P.E.
Bohler Engineering, P.C.
352 Turnpike Road
Southborough, MA 01772

Re: The Shoppes at Harrington Farms EEA #14158 – Addendum to GHG Analysis

Dear John:

As a result of comments from MassDEP on the Lowe's North Adams project, this letter provides additional information regarding the Greenhouse Gas (GHG) analysis for the proposed development in Shrewsbury.

Comparison of EENF and EIR Results

The GHG analysis presented in our July 28, 2008 GHG report for the EIR (the "EIR Report") has been updated in several areas from the GHG analysis presented in the April 17, 2008 GHG report for the EENF (the "EENF Report"). CO_2 emissions for the Base Case in the updated GHG report are different for three reasons:

1) Base Case electrical use in the supermarket has dropped from the figure of 3,628.7 MWh/yr in the EENF Report to 2,904.61 MWh/yr in the EIR Report due to an update in the formula for calculating supermarket lighting density and therefore electrical use.

2) Even with the lower electrical use for the supermarket, CO_2 emissions increased from 1,449.0 tons/yr in the EENF Report to 1,858.9 tons/yr in the EIR Report because the EENF figure was in error as it inadvertently excluded emissions associated with the refrigeration equipment.

3) Base Case gas usage in all buildings and electrical use in the retail and restaurant buildings rose slightly in the EIR Report due to an update in the formula for estimating building wall area.

The net effect of these formula changes and corrections is that Base Case CO_2 emissions rose from 2,286 tons/yr in the EENF Report to 2,743 tons/yr in the EIR Report. The EIR Report figures are the most accurate estimates.

Stationary source (CO_2) emissions from on-site fuel use and off-site generation of electricity for the Preferred Alternative are listed as 1,768 tons/yr in the EENF and 2,377 tons/yr in this SEIR. The reasons for these differences are:

1) Emissions for the Preferred Alternative are higher in the EIR Report for the same reasons given above that explain why Base Case emissions are higher in the EIR Report.

2) The EENF analysis calculated a mitigation credit for the store using T8 lighting. The EIR analysis assumes T8 fluorescent lighting is the standard for commercial building design, and consistent with MEPA Policy, that credit has been removed from the EIR calculations. The Preferred Alternative in the EIR Report now assumes T8 fixtures are replaced with higher efficiency components and motion sensors will be used in office areas. The Mitigation Alternative in the EIR Report assumes the use of higher efficiency T5 lighting in the supermarket.

3) The EENF analysis calculated a mitigation credit for the store using insulated HVAC ducts. The EIR analysis assumes insulated ducts are the standard for commercial building design, and consistent with MEPA Policy, the mitigation credit has been removed. The Preferred Alternative now assumes duct sealing prior to insulation, and the energy reduction from duct sealing has been included in the EIR calculations.

4) The EENF analysis went beyond the developer's standard design of using HVAC units with an EER of 9.5 and agreed to an EER of 11.0[1] for the build case with mitigation. In the EENF Report there were only two cases evaluated: Base Case and Mitigation Case. For the EIR Report, there are now three cases evaluated, and the Preferred Alternative assumes an EER of 9.5 while the Mitigation Alternative pushes that to an EER of 11.0., and the EIR analysis does include this credit.

5) The EENF analysis went beyond the developer's standard roof design and agreed to a cool roof on the supermarket for the build case with mitigation. In the EENF Report there were only two cases evaluated: Base Case and Mitigation Case. For the EIR Report, there are now three cases evaluated, and the Preferred Alternative assumes a standard roof while the Mitigation Alternative includes a cool roof.

6) The EENF analysis did not calculate a mitigation credit for skylights, and the EIR analysis does include this credit.

[1] The ENF Report text on page 11 states that the mitigation measure is an EER of 11, while Table 1 mentions 11.5. The text is correct and the calculations were done assuming an EER of 11.0.

The EIR Report has added a Mitigation Alternative which includes three additional mitigation measures beyond those in the Preferred Alternative:

1) HVAC energy efficiency is increased to an EER of 11.0.

2) T5 lighting will be used in the supermarket and the developer will recommend more efficient lighting than T8 to tenants for the other buildings.

3) Skylights will be used for 2.5% of the supermarket roof area to increase day-lighting.

Thank you for the opportunity to present this summary information comparing the GHG analysis done for the EENF and the EIR.

Sincerely yours,

TECH ENVIRONMENTAL, INC.

Peter H. Guldberg

Peter H. Guldberg, C.C.M.
President

3023/Letter Summarizing GHG Revisions

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
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GOVERNOR

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September 12, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
FINAL ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: The Shoppes at Harrington Farms
PROJECT MUNICIPALITY	: Shrewsbury
PROJECT WATERSHED	: Sudbury
EEA NUMBER	: 14158
PROJECT PROPONENT	: Retailscapes, LLC
DATE NOTICED IN MONITOR	: August 6, 2008

The Secretary of Energy and Environmental Affairs hereby determines that the Final Environmental Impact Report (FEIR) submitted on the above project **adequately and properly complies** with the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

Project Summary

As currently proposed, the Shoppes at Harrington Farms project involves the two-phased development of approximately 113,000 square feet (sf) of supermarket, restaurant and retail space in three separate buildings on a 24.80-acre site located on Route 9 and South Street in Shrewsbury. Phase I of the project will involve the construction of a 64,454-sf supermarket and 234 surface parking spaces. Phase II will include the construction of an approximately 42,500-sf commercial retail building, a stand-alone 6,500-sf (200 seats) restaurant building and 223 surface parking spaces. The phased project will generate approximately 7,281 new average daily trips (adt).The design program for the project was modified subsequent to the Secretary's January 23, 2008 issuance of the Certificate on the Environmental Notification form (ENF) resulting in decreased impacts to wetland resource areas and minor increases to traffic generation, surface parking, water use and wastewater generation.

Potable water use and wastewater generation is estimated in the FEIR at 15,356 gallons per day (gpd) and will be served by the Town of Shrewsbury. The project will result in the creation of approximately 8.5 acres of new impervious area. The Proponent proposes one site drive on South Street and two separate site drives on Route 9. The project's internal roadway plan calls for a wetland crossing to connect the Phase I and Phase II developments.

Required Permits and MEPA Jurisdiction

The project is undergoing MEPA review and is subject to a mandatory EIR pursuant to Section 11.03(6)(a)(6) because it involves generation of 3,000 or more new average daily trips (adt) on roadways providing access to a single location. The project is also undergoing MEPA review pursuant to Section 11.03(6)(b)(15) because it will result in the construction of 300 or more new parking spaces at a single location. The project requires a Vehicular Access Permit from the Massachusetts Highway Department (MassHighway) for access to Route 9, a Section 401 Water Quality Certificate from the Department of Environmental Protection (MassDEP), and a U.S. Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Permit for stormwater discharges from a construction site of over one acre. The project may require a Section 404 Programmatic General Permit (Category II) from the U.S. Army Corps of Engineers (USACOE). A Superseding Order of Resource Area Delineation was issued by MassDEP on May 5, 2008. The Proponent must file a Notice of Intent (NOI) with the Shrewsbury Conservation Commission for work within a resource area.

The Proponent is not seeking financial assistance from the Commonwealth. Therefore, MEPA jurisdiction applies to those aspects of the project within the subject matter of required, or potentially required, state permits that have the potential to cause damage to the environment as defined in the MEPA regulations. In this case, MEPA jurisdiction extends to transportation, wastewater, wetlands and stormwater.

Transportation

The FEIR includes an updated traffic study that conforms to the EEA/EOT Guidelines for Traffic Impact Assessment. Using the Institute of Traffic Engineers Trip Generation land use code 820 - Shopping Center, the project is estimated to generate a total of approximately 7,281 new vehicle trips on the average weekday. The traffic study addressed the proposed full build-out for the Shoppes at Harrington Farm project. The FEIR includes the following proposed traffic mitigation measures:

- geometric modifications to widen the South Street southbound approach to the Route 9/South Street intersection to provide an exclusive left-turn lane, a shared through/left-turn lane, a shared through left-turn lane, and an exclusive right-turn lane;

- geometric modifications to widen the Route 9 westbound approach to the Route 9/South Street intersection to provide an exclusive right-turn lane, two through lanes and an exclusive left-turn lane; and,
- traffic signal phasing and timing modifications for the existing Route 9/South Street traffic signal.

I note that according to MassHighway, the Proponent may be required to complete the construction of the traffic mitgation commitments prior to site occupancy. The Proponent should continue its coordination efforts with local area neighborhoods, proponents of other development projects in the area, MassHighway, the Town of Shrewsbury and the Central Massachusetts Regional Planning Commission (CRMPC) during final project design and construction. The Proponent must continue to work closely with MassHighway's Public/Private Development Unit and the District 3 Office, to successfully resolve design issues for the overall traffic mitigation plan proposed for the project.

Transportation Demand Management (TDM) Plan

The FEIR includes a description of the Proponent's Transportation Demand Management (TDM) plan proposed for the project. All project tenants and businesses should be required to participate in the proposed TDM plan. The Transportation Demand Management (TDM) plan includes:

- the appointment of an Employee Transportation Coordinator (ETC) by the supermarket tenant;
- the promotion of the use of on-site amenities including on-site banking, employee direct deposit banking, and on-line shopping with in-store pick-up;
- the installation of bicycle amenities including secured bicycle storage racks at each building; and,
- the promotion of commuter assistance programs available through MassRides.

Transit

The Proponent has continued discussions with the Worcester Regional Transit Authority (WRTA) and local area businesses in Shrewsbury to identify opportunities for providing curb-to-curb WRTA transit service, and car/vanpool service to the project site. According to the Proponent, extending existing public transit to the project site is not feasible in the near term. The Proponent has committed to reserve space near the project site South Street entrance for a potential future bus stop/shelter. The Proponent should continue to work closely with the Worcester Regional Transit Authority (WRTA), the Town of Shrewsbury and others to identify opportunities to extend existing bus service (Route #15) and/or shuttle service to the project site.

Pedestrian and Bicycle Facilities

As illustrated in site plans provided in the FEIR, the Proponent has committed to construct sidewalks along the north and south side of the project's South Street site driveway, and a small portion of South Street from the project site driveway north to an existing sidewalk.

Proposed improvements to the South Street/Route 9 intersection will be made by the Proponent to accommodate the construction of future sidewalks along a portion (approximately 450 feet) of South Street from the South Street/Site Drive intersection to the South Street/Route 9 intersection. MassDEP recommends that the Proponent relocate the proposed truck delivery route away from the north side of the property abutting the existing condominium residences to avoid creating a noise nuisance condition and to enhance pedestrian access to the project site.

In its comments, MassDEP has requested the Proponent to provide a sidewalk from the project's South Street site drive south along eastside of South Street to the Route 9/South Street intersection to connect the project site to an existing apartment complex located on the southwest corner of the on Route 9/South Street intersection. As described in the FEIR, the Proponent evaluated the construction of a sidewalk from the project's South Street driveway south along South Street to the Route 9/South Street intersection, and a crosswalk across Route 9 as part of the Proponent's mitigation commitments, and determined that construction of a crosswalk at this intersection could result in safety and traffic operation issues. The Proponent has consulted with MassHighway and has committed to ensuring that the on-site project design and proposed off-site traffic improvements to the Route 9/South Street intersection will accommodate the potential future construction of a sidewalk from the project site south along South Street to the Route 9/South Street intersection, and a pedestrian crosswalk across Route 9.

Greenhouse Gas Emissions

The FEIR includes the results of the Greenhouse Gas (GHG) Emissions analysis based on the Proponent's preliminary assumptions regarding project-related traffic and proposed building/energy consumption sources. The Proponent evaluated the change in carbon dioxide (CO_2) emissions from project-related traffic and proposed building/energy consumption sources for the 2012 Base Case (compliance with Massachusetts Building Code), 2012 Preferred Alternative (includes some energy-saving design features) and the 2012 Mitigation Case (includes additional energy saving elements). Because there was an error in the calculations presented in Table 8 in the FEIR, the Proponent submitted a revised Table 8 via email on September 11, 2008. Total CO_2 emissions under the 2012 Build are estimated at 5,674 tons per year (tpy). Under the Preferred Alternative scenario, total CO_2 emissions are estimated at 5,235 tpy, a reduction of 439 tpy, or 7.7 percent. Under the 2012 Mitigation Case, total CO_2 emissions are estimated at 5,202 tpy, a reduction of 472 tpy, or 8.3 percent.

The proponent has committed to the Mitigation Alternative items for the supermarket as part of Phase 1 of the project. The September 11, 2008 email also clarifies that the 8.3% reduction includes the measures itemized in Tables 1-B and 1-C of the FEIR for both phases of the project. The Proponent will ensure that prospective tenants for the restaurant and retail uses agree to these reasonable and standard energy efficiency design items. As stated in the FEIR, the Proponent will recommend that these tenants utilize similar mitigation strategies to the Mitigation Alternative for the supermarket (for example, a low albedo roof); however, only measures listed in Tables 1-B and 1-C for the retail and restaurant uses were assumed in the calculations. These commitments are consistent with the calculated reductions presented in the revised Table 8 and include the following measures to reduce the project's direct and indirect energy-related CO2 emissions including:

- Duct Sealing;
- Energy Management Systems/Programmable Thermostats;
- High –Efficiency HVAC Systems;
- Use of Skylights to Maximize Interior Day-Lighting;
- Third Party Building Commissioning;
- Use of Energy Efficient Windows;

- Reduced Refrigerant Use
- Use of Environmentally Friendly Building Materials;
- Use of a Construction Waste Management Program;
- Use of an Operations Waste Management Program;
- Use of a Recyclables Collection Program;
- Use of Energy Efficient Interior Lighting; and,
- Use of a Cool Roof Design.

Upon completion of construction, the Proponent should provide a certification to the MEPA Office signed by an appropriate professional (e.g., engineer, architect, general contractor) indicating that the all of the above referenced mitigation measures, or equivalent measures that collectively will reduce GHG Emissions by 8.3 %, have been incorporated into the project. The certification should be supported by as-built plans. For those measures that are operational in nature (i.e. annual subsidies for transit, TDM, recycling) the Proponent should provide an updated plan identifying the measures, the schedule for implementation and how progress towards achieving measures will be obtained. I request that MassHighway incorporate this self-certification into its Section 61 Finding for this project.

Wetlands

The Proponent modified the project design program in response to the comments received from MassDEP on the DEIR, to relocate Building B outside of wetlands jurisdictional areas to reduce the project's wetlands impacts. The project will result in permanent impacts to approximately 4,6258 sf of Bordering Vegetated Wetlands (BVW) to accommodate the construction of an internal roadway connection between the Phase I and Phase II portions of the project site. The project will also result in the alteration of approximately 4.13 acres of the 100-foot wetlands buffer area resulting from site grading and roadway construction, buildings, and stormwater management infrastructure.

Stormwater

According to the Proponent, the proposed stormwater management system for the commercial retail project has been designed to comply with MassDEP's Stormwater Management Regulations. As designed, the stormwater management system will incorporate the use of hooded deep sump catch basins to convey stormwater runoff to one on-site open detention basin and one underground detention basin.

Water Supply and Wastewater

The potable and fire protection water supply needs for the project (approximately 15,360 gpd) will be served by the Town of Shrewsbury's municipal water supply system. As described in the FEIR, the water supply for the project's proposed irrigation system will be provided by new on-site private wells. The Proponent has committed to incorporate water conservation and water use efficiency in the Phase I project design to comply with the March 1989 state plumbing

code. I strongly encourage the Proponent to commit to employing efficient commercial water conservation technologies for the Phase II portion of the project including water saving devices, low flow toilets, and low flow appliances (e.g. dishwashers, washing machines).

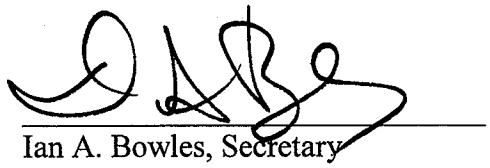
The project's wastewater flows (15,356 gpd) will be conveyed from the project site via Shrewsbury's sewer collection system to the City of Westborough's wastewater treatment facility (WWTF) for treatment and disposal to the Assabet River.

Construction Period Impacts

The FEIR includes a discussion of the Proponent's commitment to design and employ a construction mitigation plan to satisfactorily address the project's potential impacts to local businesses and nearby residential neighborhoods from construction-related project impacts including traffic, noise and dust. The Proponent should consider requiring its contractors to use on-road low sulfur diesel (LSD) fuel in their off-road construction equipment that can increase the removal of particulate matter (PM) by approximately 25 percent beyond that which can be removed by retrofitting diesel-powered equipment. All construction-related refueling and equipment maintenance activities should be conducted under cover on impervious surface areas with containment, and outside of any wetlands resource areas, endangered species habitat areas, residential areas and wellhead protection areas.

Mitigation/Section 61

As noted elsewhere in this Certificate, the Proponent should provide a certification to the MEPA Office signed by an appropriate consultant (e.g., engineer, architect, general contractor) indicating that the all of the above referenced mitigation measures have been incorporated into the project. The certification should be supported by as-built plans. For those measures that are operational in nature (i.e. annual subsidies for transit, TDM, recycling) the Proponent should provide an updated plan identifying the measures, the schedule for implementation and how progress towards achieving measures will be obtained. This self-certification will be a requirement of the MassHighway Section 61 Finding for this project.



September 12, 2008
DATE

Ian A. Bowles, Secretary

Comments Received

09/05/08 Department of Environmental Protection (MassDEP) – CERO
09/13/08 Executive Office of Transportation (MassHighway)

IAB/NCZ/ncz
EEA #14150 FEIR

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

N2

September 5, 2008

Secretary Ian A. Bowles
Executive Office of Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114

Attention: MEPA Unit – Nicholas Zavolas

Re: Final Environmental Impact Report (FEIR)
The Shoppes at Harrington Farms
Shrewsbury
EEA # 14158

Dear Secretary Bowles,

The Massachusetts Department of Environmental Protection's (MassDEP) Central Regional Office (CERO) has reviewed the FEIR for the proposed Shoppes at Harrington Farms in Shrewsbury. The proposed project consists of the two-phased development of 113,000 square feet (sf) of commercial retail and restaurant space in four separate buildings on a 24.80-acre site located on Route 9 and South Street in Shrewsbury. The first phase of the project includes two separate 64,000 sf commercial retail buildings and 258 surface parking spaces. The second phase of the project includes one 49,000 sf commercial retail building and 223 surface parking spaces. The project will generate approximately 6,850 new vehicle trips per day, and includes construction of a total of 457 new surface parking spaces. Potable water use and wastewater generation is estimated at 15,356 gallons per day (gpd) and will be served by the Town of Shrewsbury. The project will result in the creation of approximately 8.5 acres of new impervious area. The proponent proposes one site drive on South Street and two separate site drives on Route 9. The project's internal roadway plan calls for a wetland crossing to connect the two phases of developments.

MassDEP, CERO, Bureau of Waste Prevention has reviewed the FEIR and submits the following comments to be addressed by the Proponent:

Pedestrian and Bicycle Infrastructure
The project will include a sidewalk along South Street that will connect to an existing sidewalk to the north. The project should include walkways directly south to the project site from the condominium development located immediately north of the development. This would encourage foot traffic and eliminate the need to walk to South Street to access the plaza.

The project will allow but does not commit to the construction of future sidewalks along South Street to Route 9 and a crosswalk across Route 9 to connect a residential use in the Southwest corner of the intersection. Given that there is already a dense residential use in this area; the proponent should provide this pedestrian accommodation as part of the project.

Additionally, the proponent should consider the evaluation of accommodations for bicycle access (e.g. bike lanes).

Transit
The proponent did not evaluate the feasibility of shuttling people to the development from any of the few concentrated residential areas in Shrewsbury: the Center, the apartment and condominium complexes, etc. The Worcester Regional Transit Authority (WRTA) currently has a line that runs from Worcester to Shrewsbury Center. Although mention was made of future discussions with WRTA to extend existing bus service to the project site, there was no evaluation of the project site providing a shuttle to the end of the existing transit line. Whether it is a scheduled route or an on-demand shuttle to Shrewsbury Center – through its connectivity to the larger WRTA service area, this would connect a very large population to the new development via transit.

Green House Gas (GHG) Emissions
Final design for Phase I is not complete and Phase II tenants have not been identified so that commitments to mitigate GHG via building design are somewhat tentative. The summary of mitigation measures set out in section 4.1.2 in regard to the supermarket are by in large responsive to the MassDEP's and DOER's comments. However, the rationale provided for not incorporating PV now or in the future do not provide a project specific quantitative life cycle cost analysis recommended by DOER and incorporated by reference into the DEIR Certificate's scope. Should additional analysis be required, the agencies recognize that because the project is a municipal light district they are not eligible for funds from MTC Renewable Energy Trust Commonwealth Solar program that would reduce the investment cost.

Some of the key differences in design elements between the preferred and mitigation alternatives are HVAC efficiency (EER of 9.5 overall versus 9.5 for Phase II and 11 in the Phase I building only), cool roof design and lighting upgrades. In regard to the Phase II components, the proponent indicates that encouragement rather than a commitment to mitigation measures are only feasible at this stage because final decisions must be left to the tenants. Encouragement can run the gamut from an in-passing conversation to financial incentives negotiated as part of the lease, particularly for those core and shell elements such as HVAC, albedo roofs, insulation and energy efficient windows. The GHG reductions from the Phase II buildings are potentially substantial based on the estimates in Table 1-A, if they are

achieved. MassDEP suggests that the Secretary consider means through which the implementation of the Phase II mitigation measures may be influenced and monitored through, for example, conditions in the Certificate regarding certification of project-wide final design commitments and for the filing of NPC if major components of the Phase II measures are not adopted.

Water Supply
The project will be supplied by municipal water. There is an assertion but no explanation of why reuse of gray water or collection and use of rain water is infeasible for this development.

General Comment
The project currently has the truck route running between the new development and the existing condominium development to the north. The truck route should be moved either to the south of the site, along Route 9 or to the west, on a newly constructed access road. In its current proposed location it has the high likelihood of creating a nuisance condition (noise, exhaust) for the condominiums in violation of 310 CMR 7.01 and 310 CMR 7.10. Its current proposed location also precludes the inclusion of walkways from the condominiums to the development which is a pedestrian mitigation.

The MassDEP CERO appreciates the opportunity to comment on the proposed project. If you have any questions regarding these comments, please do not hesitate to contact Stella Tamul, MEPA Coordinator, at (508) 767-2763.

Sincerely,

Stella Tamul for

Paul Anderson
Deputy Regional Director
Bureau of Resource Protection

Cc: Commissioner's Office, MassDEP
Martin Suuberg, Regional Director, CERO

Bourré, Richard (EEA)

From: Peter Guldberg [pguldberg@techenv.com]
Sent: Thursday, September 11, 2008 1:41 PM
To: Buckley, Deirdre (EEA)
Cc: jkucich@bohlereng.com
Subject: Shoppes at Harrington Farms - 1 of 2 emails
Attachments: Table 8.pdf; Letter Summarizing GHG Revisions 082908.pdf

Deirdre-

This email confirms that an addition error occurred in table 8 of our July 2008 GHG analysis. The corrected table is attached. Please note that the overall reduction is 8.3%, not 10.4%. Also attached is a comparison and explanation of differences between the DEIR and FEIR GHG reports.

Peter H. Guldberg
President

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TABLE 8
GREENHOUSE GAS (CO_2) EMISSIONS SUMMARY
RETAILSCAPES DEVELOPMENT PROJECT, SHREWSBURY, MASSACHUSETTS
(TONS/YEAR)

Source	Base Case and Initial Project Design (No Energy Efficiency Measures)	Preferred Mitigation Project Design (Preferred Efficiency Measures)	Percent Reduction in GHG Emissions	Mitigation Case Project Design (Full Mitigation Efficiency Measures)	Percent Reduction in GHG Emissions
Direct Emissions	346	237	31.5%	237	31.5%
Indirect Emissions	2,397	2,140	10.7%	2,107	12.1%
Subtotal Direct and Indirect	2,743	2,377	13.3%	2,344	14.5%
Transportation Emissions	2,931	2,858	2.5%	2,858	2.5%
Total CO_2 Emissions	5,674	5,235	7.7%	5,202	8.3%

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August 29, 2008

Mr. John Kucich, P.E.
Bohler Engineering, P.C.
352 Turnpike Road
Southborough, MA 01772

Re: The Shoppes at Harrington Farms EEA #14158 – Addendum to GHG Analysis

Dear John:

As a result of comments from MassDEP on the Lowe's North Adams project, this letter provides additional information regarding the Greenhouse Gas (GHG) analysis for the proposed development in Shrewsbury.

Comparison of EENF and EIR Results

The GHG analysis presented in our July 28, 2008 GHG report for the EIR (the "EIR Report") has been updated in several areas from the GHG analysis presented in the April 17, 2008 GHG report for the EENF (the "EENF Report"). CO_2 emissions for the Base Case in the updated GHG report are different for three reasons:

1) Base Case electrical use in the supermarket has dropped from the figure of 3,628.7 MWh/yr in the EENF Report to 2,904.61 MWh/yr in the EIR Report due to an update in the formula for calculating supermarket lighting density and therefore electrical use.

2) Even with the lower electrical use for the supermarket, CO_2 emissions increased from 1,449.0 tons/yr in the EENF Report to 1,858.9 tons/yr in the EIR Report because the EENF figure was in error as it inadvertently excluded emissions associated with the refrigeration equipment.

3) Base Case gas usage in all buildings and electrical use in the retail and restaurant buildings rose slightly in the EIR Report due to an update in the formula for estimating building wall area.

The net effect of these formula changes and corrections is that Base Case CO_2 emissions rose from 2,286 tons/yr in the EENF Report to 2,743 tons/yr in the EIR Report. The EIR Report figures are the most accurate estimates.

Stationary source (CO_2) emissions from on-site fuel use and off-site generation of electricity for the Preferred Alternative are listed as 1,768 tons/yr in the EENF and 2,377 tons/yr in this SEIR. The reasons for these differences are:

1) Emissions for the Preferred Alternative are higher in the EIR Report for the same reasons given above that explain why Base Case emissions are higher in the EIR Report.

2) The EENF analysis calculated a mitigation credit for the store using T8 lighting. The EIR analysis assumes T8 fluorescent lighting is the standard for commercial building design, and consistent with MEPA Policy, that credit has been removed from the EIR calculations. The Preferred Alternative in the EIR Report now assumes T8 fixtures are replaced with higher efficiency components and motion sensors will be used in office areas. The Mitigation Alternative in the EIR Report assumes the use of higher efficiency T5 lighting in the supermarket.

3) The EENF analysis calculated a mitigation credit for the store using insulated HVAC ducts. The EIR analysis assumes insulated ducts are the standard for commercial building design, and consistent with MEPA Policy, the mitigation credit has been removed. The Preferred Alternative now assumes duct sealing prior to insulation, and the energy reduction from duct sealing has been included in the EIR calculations.

4) The EENF analysis went beyond the developer's standard design of using HVAC units with an EER of 9.5 and agreed to an EER of 11.0[1] for the build case with mitigation. In the EENF Report there were only two cases evaluated: Base Case and Mitigation Case. For the EIR Report, there are now three cases evaluated, and the Preferred Alternative assumes an EER of 9.5 while the Mitigation Alternative pushes that to an EER of 11.0., and the EIR analysis does include this credit.

5) The EENF analysis went beyond the developer's standard roof design and agreed to a cool roof on the supermarket for the build case with mitigation. In the EENF Report there were only two cases evaluated: Base Case and Mitigation Case. For the EIR Report, there are now three cases evaluated, and the Preferred Alternative assumes a standard roof while the Mitigation Alternative includes a cool roof.

6) The EENF analysis did not calculate a mitigation credit for skylights, and the EIR analysis does include this credit.

[1] The ENF Report text on page 11 states that the mitigation measure is an EER of 11, while Table 1 mentions 11.5. The text is correct and the calculations were done assuming an EER of 11.0.

The EIR Report has added a Mitigation Alternative which includes three additional mitigation measures beyond those in the Preferred Alternative:

1) HVAC energy efficiency is increased to an EER of 11.0.

2) T5 lighting will be used in the supermarket and the developer will recommend more efficient lighting than T8 to tenants for the other buildings.

3) Skylights will be used for 2.5% of the supermarket roof area to increase day-lighting.

Thank you for the opportunity to present this summary information comparing the GHG analysis done for the EENF and the EIR.

Sincerely yours,

TECH ENVIRONMENTAL, INC.

Peter H. Guldberg

Peter H. Guldberg, C.C.M.
President

3023/Letter Summarizing GHG Revisions

Bourre, Richard (EEA)

From: Peter Guldberg [pguldberg@techenv.com]
Sent: Thursday, September 11, 2008 1:01 PM
To: Buckley, Deirdre (EEA)
Cc: jkucich@bohlereng.com
Subject: The Shoppes At Harrington farms - 2 of 2 emails
Importance: High

Deirdre-

In response to your question, the developer will commit to the mitigation items in Tables 1-B and 1-C for the two outbuildings (retail and restaurant). The developer will get the tenants (not yet known) to agree to these reasonable and standard energy efficiency design items.

As stated in our GHG report on pages 13 and 14, the developer will recommend the tenants utilize similar mitigation strategies to the Mitigation Alternative for the supermarket (for example, cool roof) but any items beyond those listed in Tables 1-B and 1-C were NOT assumed in the calculations and the developer is not committing to any additional mitigation for the two outbuildings because he cannot be assured of the tenants acceptance of such high level mitigation.

The developer is committing to the Mitigation Alternative items for the supermarket as part of Phase 1 of the project. I believe this clarifies the project's commitments and these commitments are consistent with the calculated reductions presented in Table 8 (revised).

Thank you for opportunity to clarify these items.

Peter H. Guldberg
President

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Bourre, Richard (EEA)

From: Buckley, Deirdre (EEA)
Sent: Thursday, September 11, 2008 2:11 PM
To: 'Kimmell, Ken (EEA)'
Cc: Bourre, Richard (EEA)
Subject: FW: The Shoppes At Harrington farms - 2 of 2 emails
Importance: High

This email confirms that the GHG mitigation measures listed in Table 1-B and 1-C of the Final EIR are included in the 8.3% reduction for the project and, therefore, the GHG mitigation extends to Phase 1 and Phase 2.

From: Peter Guldberg [mailto:pguldberg@techenv.com]
Sent: Thursday, September 11, 2008 1:01 PM
To: Buckley, Deirdre (EEA)
Cc: jkucich@bohlereng.com
Subject: The Shoppes At Harrington farms - 2 of 2 emails
Importance: High

Deirdre-

In response to your question, the developer will commit to the mitigation items in Tables 1-B and 1-C for the two outbuildings (retail and restaurant). The developer will get the tenants (not yet known) to agree to these reasonable and standard energy efficiency design items.

As stated in our GHG report on pages 13 and 14, the developer will recommend the tenants utilize similar mitigation strategies to the Mitigation Alternative for the supermarket (for example, cool roof) but any items beyond those listed in Tables 1-B and 1-C were NOT assumed in the calculations and the developer is not committing to any additional mitigation for the two outbuildings because he cannot be assured of the tenants acceptance of such high level mitigation.

The developer is committing to the Mitigation Alternative items for the supermarket as part of Phase 1 of the project. I believe this clarifies the project's commitments and these commitments are consistent with the calculated reductions presented in Table 8 (revised).

Thank you for opportunity to clarify these items.

Peter H. Guldberg
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#14158

3.0 Greenhouse Gas Analysis

3.1 Executive Summary

A greenhouse gas emissions analysis was performed for the proposed Retailscapes Retail Development Project (the "Project"). Carbon dioxide (CO_2) emissions were quantified for: (1) the base case corresponding to the MA Building Code, (2) the preferred alternative, which includes some energy saving design features, and (3) the mitigation case and final Project design, which includes additional energy savings elements and TDM measures. This analysis uses the Tech Environmental Energy Model, which replicates the output of the EPA Energy STAR Target Finder using data and algorithms from the U.S. Department of Energy, Energy Information Administration (EIA), and the American Society of Heating, Refrigerating and Air-Conditioning Engineers. The final design includes mitigation measures that reduce the Project's direct and indirect energy-related emissions of CO_2 by 31.5% and 12.1%, respectively.

CO_2 emissions produced by Project vehicle trips were analyzed using the EPA MOBILE6.2 Mobile Source Emission Factor Model. Mitigation measures for transportation emissions include a number of transportation demand management (TDM) strategies for the Project. These measures will improve traffic operations, reduce Project generated vehicle trips, and reduce Project-related motor vehicle CO_2 emissions by approximately 2.5%. Overall, mitigation measures in the final Project design are expected to reduce the Project's total CO_2 emissions by 10.4%.

3.2 Project Greenhouse Gas (GHG) Emissions Analysis

3.2.1 Background

On April 23, 2007 The Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) established a greenhouse gas (GHG) Policy for certain MEPA projects, and the EOEEA published its "Greenhouse Gas Emissions Policy and Protocol" in the Environmental Monitor on July 11, 2007. The following GHG analysis conforms to that Policy and Protocol. The Policy requires a project to quantify carbon dioxide (CO_2) emissions and identify measures to avoid, minimize or mitigate such emissions. In addition, the Policy requires the proponent to quantify the effect of proposed mitigation in terms of emissions reduction and energy savings.

The Retailscapes Development GHG emissions include direct emissions of CO_2 from natural gas combustion for heating and from emergency generators, and indirect emissions of CO_2 from Project-generated motor vehicle trips and electricity used on the site for lighting, building cooling and ventilation, and operation of other equipment such as computers.

Please note that the building design for both Phases I and II is preliminary at this time and is expected to change as the project progresses. While the Phase I supermarket tenant may be confirmed, the Phase II tenants, and their specific building requirements are unknown at this time. It is notable that the Phase I supermarket component of this project is being considered for submittal to the U.S. Green Building Council for LEED certification and the Proponent will encourage prospective Phase II users to consider

similar certification. In its initial review of the Greenhouse Gas Emission Analysis submitted with the DEIR, the Division of Energy Resources made several requests which appear to exceed the Greenhouse Gas policy, but have been addressed in this revised analysis, and in the Response to Comments section at the end of this FEIR.

3.2.2 Modeling Energy and GHG Emissions

Energy modeling for the Project used the Tech Environmental Energy Model, which replicates the output of the EPA Energy STAR Target Finder using data and algorithms from the U.S. DOE Energy Information Administration (EIA) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers. The Project consists of a 64,454 square foot (sf) supermarket, a 42,084 sf retail building, and a 6,500 sf restaurant. The base case and initial Project design was analyzed and energy use calculates to be 3,745 megawatt-hours per year (MWh/year) of electricity and 5,736 thousand cubic feet per year (Mcf/year) of natural gas, see Tables 1-A to 1-D. For the preferred alternative, these energy figures are 3,344 MWhr/year of electricity and 3,927 Mcf/year of gas. The mitigation case and final Project design, discussed in Section 4, reduces energy use to 3,292 MWhr/year and 3,927 Mcf/year.

TABLE 1-A

ENERGY AND CO_2 MODELING FOR RETAILSCAPES DEVELOPMENT

Supermarket

Supermarket	Area (sf)	Electrical Usage (MWh/yr)	Electrical Reduction (%)	Gas Usage (Mcf/yr)	Gas Reduction (%)	Heating CO2 Emissions (tons/yr)	Electrical CO2 Emissions (tons/yr)	Total CO2 Emissions (tons/yr)	CO2 Emissions Reduction (%)
Base Case	64,454	2,904.6		2,813.6		169.7	1,858.9	2,028.6	
R-30 roof upgrade, R-19 wall upgrade	64,454	2,847.0	2.0%	2,483.1	11.7%	149.7	1,822.0	1,971.8	2.8%
Super Energy Efficient HVAC (EER = 11)	64,454	2,810.1	3.3%	2,813.6	0.0%	169.7	1,798.5	1,968.1	3.0%
Energy Efficient HVAC (EER = 9.5)	64,454	2,860.8	1.5%	2,813.6	0.0%	169.7	1,830.9	2,000.6	1.4%
Duct Sealing	64,454	2,821.5	2.9%	2,355.5	16.3%	142.0	1,805.7	1,947.8	4.0%
Efficient Windows	64,454	2,843.5	2.1%	2,463.2	12.5%	148.5	1,819.8	1,968.4	3.0%
Programmable Thermostat	64,454	2,869.9	1.2%	2,538.8	9.8%	153.1	1,836.8	1,989.8	1.9%
Cool Roof Design	64,454	2,871.3	1.1%	2,842.3	-1.0%	171.4	1,837.6	2,009.0	1.0%
Skylights	64,454	2,902.1	0.1%	2,837.5	-0.8%	171.1	1,857.4	2,028.5	0.0%
Level 1 (5% Lighting Upgrade [w/sf])	64,454	2,874.8	1.0%	2,813.6	0.0%	169.7	1,839.8	2,009.5	0.9%
Level 2 (10% Lighting Upgrade [w/sf])	64,454	2,848.1	1.9%	2,813.6	0.0%	169.7	1,822.8	1,992.4	1.8%

TABLE 1-B

ENERGY AND CO_2 MODELING FOR RETAILSCAPES DEVELOPMENT

Retail

Retail	Area (sf)	Electrical Usage (MWh/yr)	Electrical Reduction (%)	Gas Usage (Mcf/yr)	Gas Reduction (%)	Heating CO2 Emissions (tons/yr)	Electrical CO2 Emissions (tons/yr)	Total CO2 Emissions (tons/yr)	CO2 Emissions Reduction (%)
Base Case	42,084	640.2		1,268.4		76.5	409.7	486.2	
R-30 roof upgrade, R-19 wall upgrade	42,084	619.3	3.3%	1,140.5	10.1%	68.8	396.3	465.1	4.3%
Energy Efficient HVAC (EER = 9.5)	42,084	622.2	2.8%	1,268.4	0.0%	76.5	398.2	474.7	2.4%
Duct Sealing	42,084	606.1	5.3%	1,067.8	15.8%	64.4	387.9	452.3	7.0%
Efficient Windows	42,084	610.7	4.6%	1,088.1	14.2%	65.6	390.9	456.5	6.1%
Programmable Thermostat	42,084	626.0	2.2%	1,148.1	9.5%	69.2	400.6	469.9	3.4%
Level 1 (5% Lighting Upgrade [w/sf])	42,084	627.2	2.0%	1,268.4	0.0%	76.5	401.4	477.9	1.7%

TABLE 1-C

ENERGY AND CO_2 MODELING FOR RETAILSCAPES DEVELOPMENT

Restaurant

Restaurant	Area (sf)	Electrical Usage (MWh/yr)	Electrical Reduction (%)	Gas Usage (Mcf/yr)	Gas Reduction (%)	Heating CO2 Emissions (tons/yr)	Electrical CO2 Emissions (tons/yr)	Total CO2 Emissions (tons/yr)	CO2 Emissions Reduction (%)
Base Case	6,500	200.4		1,653.8		99.7	128.2	228.0	
R-30 roof upgrade, R-19 wall upgrade	6,500	196.9	1.7%	1,626.4	1.7%	98.1	126.0	224.1	1.7%
Energy Efficient HVAC (EER = 9.5)	6,500	197.5	1.4%	1,653.8	0.0%	99.7	126.4	226.1	0.8%
Duct Sealing	6,500	194.9	2.7%	1,611.7	2.5%	97.2	124.7	221.9	2.7%
Efficient Windows	6,500	195.7	2.3%	1,616.9	2.2%	97.5	125.3	222.8	2.3%
Programmable Thermostat	6,500	198.1	1.1%	1,628.6	1.5%	98.2	126.8	225.0	1.3%
Level 1 (5% Lighting Upgrade [w/sf])	6,500	198.7	0.8%	1,653.8	0.0%	99.7	127.2	226.9	0.5%

TABLE 1-D
ENERGY AND CO_2 MODELING FOR RETAILSCAPES DEVELOPMENT
Total

TOTAL	Area (sf)	Electrical Usage (MWh/yr)	Electrical Reduction (%)	Gas Usage (Mcf/yr)	Gas Reduction (%)	Heating CO2 Emissions (tons/yr)	Electrical CO2 Emissions (tons/yr)	Total CO2 Emissions (tons/yr)	CO2 Emissions Reduction (%)
Base Case	113,038	3,745		5,736		346	2,397	2,743	
Combined Efficiency Measures									
Preferred Alternative									
R-30 Roof Upgrade, R-19 Wall Upgrade									
Energy Efficient HVAC (EER = 9.5)									
Duct Sealing	113,038	3,344	10.7%	3,927	31.5%	237	2,140	2,377	13.3%
Efficient Windows									
Programmable Thermostat									
Skylights									
Level 1 (5% Lighting Upgrade [w/sf])									
Mitigation Alternative									
R-30 Roof Upgrade, R-19 Wall Upgrade									
Super Energy Efficient HVAC (EER = 11) [Supermarket Only {Other Buildings EER = 9.5}]									
Duct Sealing									
Efficient Windows	113,038	3,292	12.1%	3,927	31.5%	237	2,107	2,343	14.6%
Programmable Thermostat									
Cool Roof Design									
Skylights									
Level 2 (10% Lighting Upgrade [w/sf]) [Supermarket Only {Other Buildings 5% Upgrade}]									

3.3 Transportation GHG Emissions Analysis

Transportation CO_2 emissions were calculated and the results are summarized in Table 2. The mesoscale study area was defined in accordance with DEP guidance to include the roadway segments in the Project area that will potentially experience an increase of 10% in traffic due to the Project and which currently operate at Level-of-Service (LOS) D, E, or F, or will be degraded to LOS D, E, or F in the future. To be conservative, the mesoscale study area includes the entire traffic study area for the Project and is defined by the following twenty roadway segments in Shrewsbury (see Figure 1):

1. Boston Turnpike (Rt. 9) – Oak Street to Lake Street
2. Lake Street – South Quinsigamond Avenue to Boston Turnpike
3. Lake Street – Boston Turnpike to Grafton Street
4. Grafton Street – Main Street to Lake Street
5. Grafton Street – Lake Street to Boston Turnpike
6. Boston Turnpike – Lake Street to Grafton Street
7. Grafton Street – Hartford Turnpike to Boston Turnpike
8. Boston Turnpike – Grafton Street to South Street
9. Main Street – Maple Avenue to Grafton Street
10. Boylston Street – Boylston Circle to Main Street
11. Main Street – Grafton Street to South Street
12. South Street – Main Street to Floral Street
13. Main Street – Main Circle to South Street
14. South Street – Floral Street to Site Drive #1
15. Floral Street – South Street to Floral Street School Driveway
16. South Street – Site Drive #1 to Boston Turnpike
17. South Street – Hartford Turnpike to Boston Turnpike
18. Boston Turnpike – South Street to Site Drive #2
19. Boston Turnpike – Site Drive #2 to Site Drive #3
20. Boston Turnpike – Site Drive #3 to Hartford Turnpike

3.3.1 Mesoscale Analysis Procedure

The mesoscale analysis calculated emissions of CO_2 over the study area for four scenarios:

- 2008 Existing
- 2012 No-Build
- 2012 Build
- 2012 Build with Mitigation.

The vehicle miles traveled (VMT) for each roadway segment was calculated by multiplying the length of each road segment by the average daily traffic volume on the segment. Average daily (24-hour) traffic volumes (ADTs) were provided by MDM Transportation Consultants, Inc. Table 3 shows the VMT calculation spreadsheet.

The CO_2 emissions for each roadway segment were calculated by multiplying the daily VMT by the MOBILE6.2 predicted CO_2 emission factors in grams per mile. Table 4 shows the CO_2 emission calculation spreadsheet. The MOBILE6.2 model was run using inputs that

follow the latest Massachusetts DEP guidance (dated February 12, 2003) for the MOBILE6.2 model, with MOBILE6.2 input files for 2008 and 2012 provided by the DEP.

3.3.2 Predicted Transportation Impacts

A summary of the results of the mesoscale analysis is presented in Table 2. The table shows that the 2007 Existing CO_2 mesoscale emissions over the study area are 44,461.7 tons/year. The mesoscale emissions of CO_2 for the 2012 No-Build case are predicted to be 55,251.5 tons/year. The mesoscale emissions of CO_2 for the 2012 Build case are predicted to be 58,182.3 tons/year. The difference between the Build and No-Build CO_2 emissions in the year 2012, 2,930.9 tons/year, represents the CO_2 emissions released by Project-generated trips. The transportation mitigation measures discussed in Section 4.3 reduce Project transportation CO_2 emissions to 2,857.6 tons/year, a reduction of 2.5%.

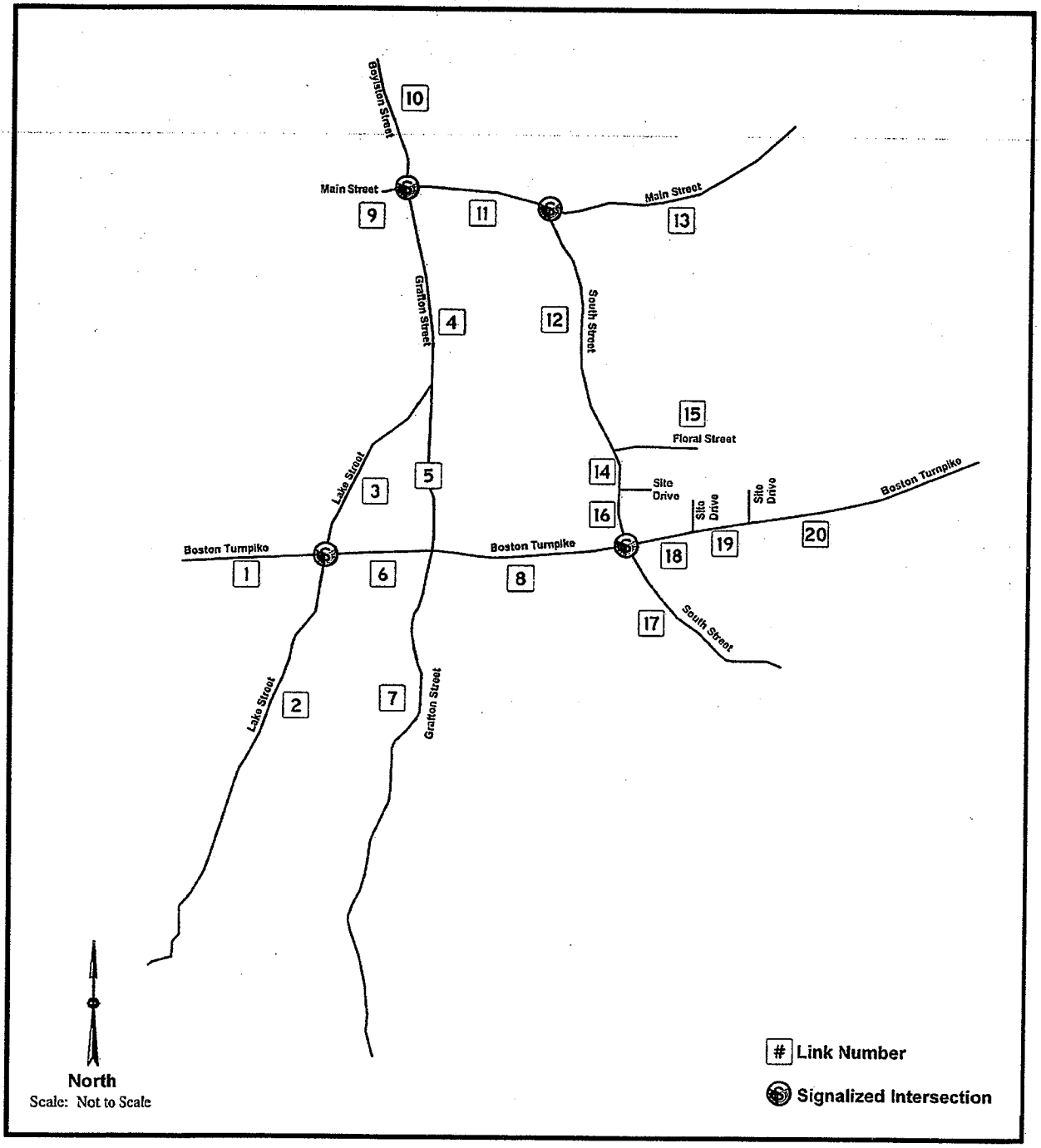

Figure 1.

Retailscapes Development GHG Analysis
Traffic Study Area

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TABLE 2
MOTOR VEHICLE CO_2 EMISSIONS SUMMARY

Total Predicted CO_2 Emissions in Mesoscale Study Area			
2007 Existing	2012 No-Build	2012 Build	2012 Build with Mitigation
110,506.8 kg/day	137,324.1 kg/day	144,608.5 kg/day	144,426.4 kg/day
44,461.7 tons/year	55,251.5 tons/year	58,182.3 tons/year Project: 2,930.9 tons/year	58,109.0 tons/year Project: 2857.6 tons/year

TABLE 3
Vehicle Miles Traveled (VMT) in the Mesoscale Study Area - Retailscapes Retail Development - Shrewsbury, MA

		Average Daily Traffic (ADT) (vehicles/day)				Vehicle Miles Traveled (VMT) (miles/day)			
Link I.D.	Link Length (feet)	2007 Existing	2012 No-Build	2012 Build	2012 Build w/mitig.*	2007 Existing	2012 No-Build	2012 Build	2012 Build w/mitig.*
1	2,810	35,985	44,383	45,907	45,869	19,151	23,620	24,432	24,411
2	9,120	5,184	6,874	7,230	7,221	8,954	11,873	12,488	12,473
3	4,075	6,752	9,822	9,889	9,887	5,211	7,580	7,632	7,631
4	3,950	13,704	16,474	16,530	16,529	10,252	12,324	12,366	12,365
5	3,310	4,572	5,072	5,072	5,072	2,866	3,180	3,180	3,180
6	2,115	37,731	47,642	49,589	49,540	15,114	19,084	19,864	19,844
7	10,470	3,693	4,271	4,271	4,271	7,323	8,469	8,469	8,469
8	3,810	37,097	46,486	48,432	48,383	26,769	33,544	34,948	34,913
9	500	21,435	24,016	24,450	24,439	2,030	2,274	2,315	2,314
10	2,640	18,977	21,813	22,915	22,887	9,489	10,907	11,458	11,444
11	2,835	17,264	19,166	20,757	20,717	9,270	10,291	11,145	11,124
12	5,060	9,878	11,335	13,582	13,526	9,466	10,863	13,016	12,962
13	5,305	11,658	12,670	13,860	13,830	11,713	12,730	13,926	13,896
14	1,620	11,168	12,959	16,085	16,007	3,427	3,976	4,935	4,911
15	1,635	4,761	5,362	5,973	5,958	1,474	1,660	1,850	1,845
16	300	11,168	12,959	16,507	16,418	635	736	938	933
17	4,100	8,220	9,978	11,457	11,420	6,383	7,748	8,897	8,868
18	200	37,420	47,175	49,077	49,029	1,417	1,787	1,859	1,857
19	800	37,420	47,175	49,355	49,301	5,670	7,148	7,478	7,470
20	6,140	37,420	47,175	48,532	48,498	43,515	54,859	56,437	56,397
					VMT (miles/day):	200,128	244,654	257,631	257,307

*Assumes a 2.5% reduction in the total project-generated traffic due to the implementation of proposed Transporation Demand Management (TDM).

TABLE 4
Total Motor Vehicle Carbon Dioxide (CO_2) Emissions in the Mesoscale Study Area - Retailscapes Retail Development - Shrewsbury, MA

		MOBILE6.2 CO_2 Emission Rate (gram/mile)		Vehicle Miles Traveled (VMT) (miles/day)				Mesoscale CO_2 Emissions (kg/day)			
Link I.D.	Speed (mph)	2007	2012	2007 Existing	2012 No-Build	2012 Build	2012 Build w/mitig.	2007 Existing	2012 No-Build	2012 Build	2012 Build w/mitig.
1	-	552.18	561.30	19,151	23,620	24,432	24,411	10,574.9	13,258.2	13,713.4	13,702.1
2	-	552.18	561.30	8,954	11,873	12,488	12,473	4,944.3	6,664.5	7,009.6	7,001.0
3	-	552.18	561.30	5,211	7,580	7,632	7,631	2,877.4	4,254.9	4,283.9	4,283.2
4	-	552.18	561.30	10,252	12,324	12,366	12,365	5,661.0	6,917.6	6,941.1	6,940.6
5	-	552.18	561.30	2,866	3,180	3,180	3,180	1,582.6	1,784.7	1,784.7	1,784.7
6	-	552.18	561.30	15,114	19,084	19,864	19,844	8,345.6	10,711.8	11,149.5	11,138.6
7	-	552.18	561.30	7,323	8,469	8,469	8,469	4,043.6	4,753.8	4,753.8	4,753.8
8	-	552.18	561.30	26,769	33,544	34,948	34,913	14,781.2	18,828.2	19,616.4	19,596.7
9	-	552.18	561.30	2,030	2,274	2,315	2,314	1,120.8	1,276.5	1,299.6	1,299.0
10	-	552.18	561.30	9,489	10,907	11,458	11,444	5,239.4	6,121.8	6,431.1	6,423.4
11	-	552.18	561.30	9,270	10,291	11,145	11,124	5,118.5	5,776.2	6,255.7	6,243.8
12	-	552.18	561.30	9,466	10,863	13,016	12,962	5,227.2	6,097.2	7,305.9	7,275.7
13	-	552.18	561.30	11,713	12,730	13,926	13,896	6,467.8	7,145.3	7,816.5	7,799.7
14	-	552.18	561.30	3,427	3,976	4,935	4,911	1,892.1	2,231.8	2,770.1	2,756.7
15	-	552.18	561.30	1,474	1,660	1,850	1,845	814.1	932.0	1,038.2	1,035.5
16	-	552.18	561.30	635	736	938	933	350.4	413.3	526.4	523.6
17	-	552.18	561.30	6,383	7,748	8,897	8,868	3,524.5	4,349.0	4,993.6	4,977.5
18	-	552.18	561.30	1,417	1,787	1,859	1,857	782.7	1,003.0	1,043.4	1,042.4
19	-	552.18	561.30	5,670	7,148	7,478	7,470	3,130.7	4,012.0	4,197.4	4,192.8
20	-	552.18	561.30	43,515	54,859	56,437	56,397	24,028.1	30,792.2	31,678.0	31,655.9
					Total Daily CO_2 Emissions (kg/day)			110,506.8	137,324.1	144,608.5	144,426.4
					Total Annual CO_2 Emissions (tons/yr)			44,461.7	55,251.5	58,182.3	58,109.0
					Project Annual CO_2 Emissions (tons/yr)			-	-	2,930.9	2,857.6

3.4 Greenhouse Gas (GHG) Mitigation Analysis

The GHG Policy requires that the Project proponent identify measures to avoid, minimize or mitigate GHG emissions. The following sections discuss the measures the Retailscapes Retail Development Project will implement.

3.4.1 Siting and Site Design Mitigation Measures

All reasonable and feasible siting and site design mitigation measures will be adopted by the Retailscapes Development project, see Table 5. The measures the Project proponent intends to pursue are listed below.

Sustainable Development Principles – The Project design promotes compact development and conserves land. A total of 3 commercial buildings will be built on 24.9 acres with approximately 60% of the land left as open space.

Low Impact Stormwater Design – The impervious area in the site will be minimized. Further, the site will be designed in full conformance with the Massachusetts Stormwater Management Handbook.

Conserve and Restore Natural Areas – There will be minimal wetland impact on the site. There are currently approximately 375,000 sq. ft of wetland, of which only approximately 4,625 sq. ft. will be displaced. Wetland replication will be proposed in excess of a 1.5:1 ratio. Further, enhancements to existing stressed wetland systems are proposed to improve on-site wetland systems in the build condition.

Support Alternative Transportation – While no public transportation passes by the site, bicycle storage will be included in the Project to encourage alternative transportation to the site.

Minimize Energy Use Through Building Orientation – The restaurant and retail buildings are expected to face south on the site, providing some solar gain through the front windows. A south-facing orientation for the supermarket is infeasible on this site given the limited area outside of wetlands, building setbacks and municipal site plan requirements governing site development.

Additional siting and site design mitigation measures were also considered for the Retailscapes Development Project, but were rejected for the reasons given in Table 5 and within this analysis.

3.4.2 Building Design and Operation Mitigation Measures

All reasonable and feasible building design and building operation mitigation measures will be adopted by the Project, see Table 6. These currently anticipated measures are listed below and in aggregate they would reduce the combination of direct and indirect CO2 emissions by 13.3% in the preferred mitigation case and 14.5% in the full mitigation design, see Table 1. Mitigation measures to reduce direct and indirect CO2 emissions are presented together because measures to reduce electrical use for cooling in a building inadvertently require more fuel to be burned for space heating because heat acquired from solar gain is reduced. The following mitigation measures are currently being considered in the project design and are assumed for the CO2 emission calculations in Table 1. At the present time, a supermarket tenant has been identified for Phase I of the development that is considering seeking LEED Certification and currently anticipates including the design elements outlined below. Phase II is still in preliminary design and the end-user tenants have yet to be determined and thus their specific GHG mitigation efforts are unknown. However, they will be encouraged by the proponent to take similar mitigation and LEED certification approaches.

Design Elements of the Preferred Alternative

Duct Sealing – It is anticipated that HVAC supply ducts will be sealed and then insulated to reduce energy losses.

Energy Management System / Programmable Thermostats – The proposed supermarket is part of a regional chain of markets, and it is anticipated that the proposed Phase I building will be connected to the highly efficient energy management system for the chain's stores that is programmed and operated from its operations headquarters. Store functions and energy needs are closely monitored using sensors and use of heat, cooling, and lighting is minimized. For the restaurant and retail building, it is expected that programmable thermostats will be provided.

High-Efficiency HVAC Systems – The preferred anticipated alternative is use of HVAC units with an Energy Efficiency Ratio (EER) of 9.5. These are energy saving units since standard HVAC units have an EER of 8.5.

Maximize Interior Day-Lighting – The current supermarket design uses skylights for approximately 2.5% of the roof area. These will provide day-lighting and reduce interior electric lighting needs.

Third Party Commissioning – It is anticipated that the Project will use a third party to do building commissioning.

Purchase Renewable Energy – The Project must purchase its electricity from the Shrewsbury Municipal Electric Company (SELCO). SELCO does not have any contracts to purchase renewable energy, but based on the REC's (Renewable Energy Credits) that were sold in 2007, the percent of energy from renewable sources was .007% for 2007[1].

[1] Personal communication, Mr. Ralph Iaccarino, Manager of Engineering, Shrewsbury Electric and Cable Operations.

TABLE 5
PROJECT SITING AND SITE DESIGN MITIGATION MEASURES CONSIDERED
RETAILSCAPES RETAIL DEVELOPMENT PROJECT

Suggested Mitigation Measure	Part of Project Design	Technically Infeasible	Inappropriate to Project Type
Sustainable Development Principles to integrate transportation and land use	✓		
Permanent protection for open space on Project site			✓
Conserve and restore natural areas on-site	✓		
Minimize building footprint			✓
Design Project to support alternative transportation to site (transit, walking, bike)	✓		
Use Low Impact Development for Stormwater Design	✓		
Minimize energy use through building orientation	✓(PH II)	✓(PH I)	

TABLE 6
BUILDING DESIGN AND OPERATION MITIGATION MEASURES CONSIDERED
RETAILSCAPES RETAIL DEVELOPMENT PROJECT

Suggested Mitigation Measure	Part of Project Design	Technically Infeasible	Inappropriate to Project Type
Construct green roofs			✓
Use high-albedo roofing materials	✓		
Install high-efficiency HVAC systems	✓		
Eliminate or reduce refrigerants in HVAC systems	✓		
Reduce energy demand by using peak shaving or load shifting strategies			✓
Maximize interior day-lighting	✓		
Incorporate window glazing to balance and optimize day-lighting, heat loss and solar heat gain	✓		
Incorporate above average insulation to reduce heat loss	✓		
Incorporate motion sensors in lighting and climate control	✓		
Use efficient, directed exterior lighting	✓		
Incorporate on-site renewable energy sources into project			✓
Incorporate comined heat and power (CHP) technologies into project			✓
Use water conserving fixtures that exceed building code requirements	✓		
Re-use gray water and/or collect and re-use rain water			✓
Provide for storage and collection of recyclables in building design	✓		

TABLE 6 (continued)
BUILDING DESIGN AND OPERATION MITIGATION MEASURES CONSIDERED
RETAILSCAPES RETAIL DEVELOPMENT PROJECT

Suggested Mitigation Measure	Part of Project Design	Technically Infeasible	Inappropriate to Project Type
Use building materials with recycled content, rapidly renewable building materials, certified by the Foresrtry Stewardship Council and manufactured in the region	✓		
Construction waste management to recycle materials	✓		
Operations waste management to recycle materials	✓		
Use low-VOC adhesives, sealants, paints, carpets and wood	✓		
Conduct 3rd party building commissioning to ensure energy performance	✓		
Track energy performance of building and develop strategy to maintain efficiency	✓		
Purchase Energy Star rated appliances	✓		

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Energy Efficient Windows - A thermal break design is currently expected for the Project's metal window frames, and the windows are expected to have a low-e coating to provide more shading while maintaining light transmission.

Reduce Refrigerant Use – The supermarket currently has a design that uses secondary coolants to reduce the length of piping and opportunities for leaks of refrigerants from the refrigeration systems used for coolers and freezers. This new low refrigerant use design reduces the leak rate of refrigerants by 80% over standard supermarket refrigeration system designs.

Building Materials – Whenever possible, the Project will use environmentally friendly building materials, including materials with recycled content, rapidly renewable building materials, and low-VOC paints. Also when practical, the Project will purchase building materials that are manufactured within the region. The supermarket walls are expected to be constructed with precast concrete panels that contain recycled ash.

Construction Waste Management – During Project construction, it is anticipated that special dumpsters will be used to source separate construction and demolition debris such as wood and metal and these materials will be sent to a recycling center.

Operations Waste Management – It is expected that the supermarket will use the following three strategies to reduce operations waste: 1) All cardboard will be broken down and baled for shipment back to the supermarket's central warehouse for recycling; 2) Wood and plastic pallets are collected and returned to the supermarket's central warehouse for reuse/recycling; and 3) All vegetable waste from the supermarket will be emulsified and biologically treated using the Bio-X process as a pre-treatment process before the material is discharged as wastewater to the municipal sewage treatment system.

Collection of Recyclables – The Project design currently provides for storage and collection of recyclables as described further in this section.

Water Conserving Fixtures – The Project proponent will use water conserving fixtures that exceed building code requirements.

Additional Design Elements for the Mitigation Alternative

Energy Efficient Interior Lighting – For the mitigation alternative, the supermarket expects to use T5 lighting in the supermarket. Interior lighting for the restaurant and retail space will be specified by the tenants. The developer will recommend more efficient lighting than standard T8 lighting fixtures, but final lighting design is the tenants' decision.

Cool Roof Design – For the mitigation alternative, the supermarket expects to use a reflective white roof. This would increase the reflection of sunlight and will help maintain a cooler building temperature in the summer, reducing energy use. The roof membrane for the restaurant and retail space will be specified by the tenants. The developer will recommend a cool roof membrane, but the final roof design is the tenants' decision.

High-Efficiency HVAC Systems – For the mitigation alternative, the supermarket

will use HVAC units with an EER of 11.0. The tenants will install HVAC units for the restaurant and retail building. The developer will recommend an EER of 11.0, but the final equipment selection for those two buildings will be made by the tenants.

The supermarket component of the project is willing to commit to the above or similar additional design features (Mitigation Alternative) in its final design for the Project. Other building design and operation mitigation measures were considered for the Project, but were rejected for the reasons given in Table 6, discussed below and discussed in the response to comments on the DEIR.

Some mitigation measures listed in Table 6 are not appropriate or are not feasible. For example, the Phase I building footprint cannot be minimized. Building the supermarket as a two-story building to minimize the building footprint would impose unacceptable construction costs on the Project and unacceptable inconvenience on the customers. Thus, minimizing the building footprint is inappropriate to the project type. Also, supermarkets must be open for customers during the daytime period when the peak electrical demand occurs in the regional grid. Thus, peak shaving or load shifting, which would require shutting down operations during the daytime, are no feasible for this project. Additionally, the prototype supermarket design does not include gray water reuse.

3.4.3 Transportation Mitigation Measures

All reasonable and feasible transportation demand mitigation (TDM) measures will be adopted by the Project, see Table 7. These measures are listed below and in aggregate they would reduce CO2 transportation emissions by 2.5%.

Parking Capacity – The Project's supermarket parking capacity is sized to meet, but not exceed, local parking requirements. Parking for the retail/restaurant portion of the site is below the zoning requirements.

On-Site Amenities – The Project will provide on-site amenities for customers visiting the site such as Phase I on-site banking and restaurant.

Bike Storage – The Project will provide secure bicycle storage.

Additional transportation mitigation measures were also considered for the Project, as listed in Table 7, but were rejected for the reasons given below.

Locate New Buildings in or Near Areas Designated for Transit-Oriented Development- this option is not feasible since no mass-transit opportunities are available in the area.

Purchase Alternative Fuel and/or Fuel Efficient Vehicles for Fleet- This feature is not appropriate for the use since it is not a fleet maintenance center, nor is it a fuel supply use.

Provide New Transit Service or Support Extension of Existing Transit- As described previously and further discussed in Traffic Impact Analysis Section 2.0, transit service is

not available in this area.

Support Expansion of Parking at Park-n-Ride Lots or Transit Stations- The project Proponent has committed to other improvements that will enhance area traffic flow. There are no known local Park-n-Ride or Transit stations that would be used by customers of the proposed project.

Develop Multi-Use Paths To and Through Site- Per section 2.0 of this FEIR, pedestrian connections along and across Route 9 have been discouraged by MassHighway. A pedestrian route, usable by bicycles is proposed to connect residential uses to the north through the site (see Site Schematic Figure 1.2).

Develop and Implement a Marketing/Information Program that Distributes Ridesharing/Transit Information- The Proponent will encourage use of the MassRides Program described in the Traffic Demand Management (section 2.6.2) of this FEIR.

Subsidize Transit Passes- Since there are no transit services to the site, subsidization of transit passes is not appropriate for this project.

Use of Pre-Tax Dollars For Non-Single Occupancy Vehicle Commuting Costs- As noted in section 2.6.2, ridesharing/carpooling will be encouraged by the project Proponent, although this specific program is not anticipated to be offered by the project Proponent.

Reduce Employee Trips During Peak Periods through Alternative Work Schedules- Due to the nature of the proposed Phase I tenant, staggering of employee work hours is not feasible. Phase II businesses are not expected to be able to stagger work hours either due to the probable nature of those businesses.

Provide a Guaranteed Ride Home Program- As noted herein, ridesharing will be promoted, but this specific program is not part of the project Proponent's business plan.

3.5 Mitigation Summary

Table 8 summarizes the CO2 emissions for the Retailscapes Retail Development Project for the base case (a building that complies with MA Building Code), the preferred alternative (includes some energy mitigation measures), and the mitigation alternative (includes additional energy savings elements and TDM measures). The Phase I supermarket commits to the mitigation alternative for which total CO2 emissions are reduced 10.4% from 8,417 tons/year to 7,546 tons/year. The Phase II tenants will be encouraged to utilize similar mitigation strategies.

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TABLE 7
TRANSPORTATION DEMAND MITIGATION MEASURES CONSIDERED
RETAILSCAPES RETAIL DEVELOPMENT PROJECT

Suggested Mitigation Measure	Part of Project Design	Technically Infeasible	Inappropriate to Project Type
Locate new buildings in or near areas designated for transit-oriented development		✓	
Purchase alternative fuel and/or fuel efficient vehicles for fleet			✓
Provide new transit service or support extension of existing transit		✓	
Support expansion of parking at Park-n-Ride lots or transit stations		✓	
Develop multi-use paths to and through site			✓
Size parking capacity to meet, but not exceed, local parking requirements	✓		
Pursue opportunities to minimize parking supply through shared parking	✓		
Develop a parking management program to minimize parking requirements	✓		
Develop and implement a Marketing/Information Program that distributes ridesharing/transit information			✓
Subsidize transit passes			✓
Use of pre-tax dollars for non-sigle occupancy vehicle commuting costs			✓
Reduce employee trips during peak periods through alternative work schedules			✓
Provide a guaranteed ride home program			✓
Provide on-site amenities such as banks, dry cleaning, food service	✓		
Provide bicycle storage	✓		

TABLE 7 (continued)

voluntary GHG submission

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Deval L. Patrick
GOVERNOR

Timothy P. Murray
LIEUTENANT GOVERNOR

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November 14, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Massachusetts Turnpike Parcel 7 Air Rights, Kenmore/Fenway Area
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 14163
PROJECT PROPONENT	: Meredith Kenmore/Fenway Development Group. LLC
DATE NOTICED IN MONITOR	: August 27, 2008

As Secretary of Energy and Environmental Affairs, I hereby determine that the Draft Environmental Impact Report (DEIR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00). The proponent may prepare and submit for review a Final Environmental Impact Report (FEIR).

As described in the Draft EIR, the project includes the construction of approximately 1.3 million square feet (sf) of housing, offices, retail space and parking directly adjacent to the Massachusetts Bay Transportation Authority (MBTA) Yawkey Commuter Rail Station. The 3.63-acre project site is designated as the Massachusetts Turnpike Authority's (MTA) Parcel 7, which comprises the area over Interstate 90 (the Massachusetts Turnpike) between the Beacon Street overpass to the west and the Brookline Avenue overpass to the east, as well as an area on the east side of Beacon Street between the Mass Turnpike and Maitland Street. The project will include four buildings, ranging in heights from seven to 23 stories, with 308 residential units,

387,000 sf of commercial space, 92,500 sf of retail space, a private parking garage (590 spaces), a 700-space shared-use parking garage (620 public, 80 private), and public open space and pedestrian connections. A 2,000 sf community center has been proposed for incorporation into the development program.

According to the Proponent, the development of a multi-building air-rights project on this site would serve to unify the Beacon Street and Brookline Avenue corridors, and assist in facilitating improved connections between the Fenway Park/Landsdowne Street entertainment areas with Kenmore Square, Audubon Circle, Boston University and a multi-modal transportation center at Yawkey Station. Under existing conditions the project site is characterized by long, unprotected pedestrian corridors adjacent to roadways and parking lots. The site lacks vibrant street-level uses, streetscape or landscape amenities and open space, and clear pedestrian connections to the Yawkey Commuter Rail Station. The site serves as an asset to the Longwood Medical Area (LMA) and Fenway Park, as it provides parking for LMA staff and visitors to events at Fenway Park.

Project impacts are estimated to include 5,514 net new vehicle trips per day, along with the construction of 1,290 new parking spaces. Parking spaces will serve the new uses proposed on-site, as well as demand generated by sporting events and entertainment uses in the Fenway area, along with parking demands associated with the nearby Longwood Medical Area (LMA). The project is estimated to use approximately 114,600 gallons per day (gpd) of water and generate approximately 94,636 gpd of wastewater. The project will span an area of the Mass Turnpike approximately 600 feet in length between Beacon Street and Brookline Avenue. Access and egress to the shared-use parking garage will be from Beacon Street and Brookline Avenue. Access and egress to the underground private parking garage will be from Maitland Street and the new Yawkey Way Extension. The project will include a land transfer (a long-term ground and air rights lease) from the MTA to the proponent.

Jurisdiction and Permitting

The project exceeds a mandatory EIR threshold in accordance with 301 CMR 11.03, and will require several state permits. The project was subject to the preparation of a mandatory EIR pursuant to: Section 11.03(6)(a)(6) due to the generation of 3,000 or more new average daily trips on roadways providing access to a single location; and Section 11.03(6)(a)(7) due to the construction of 1,000 or more new parking spaces at a single location. The project will require a Sewer Connection/Extension Permit, Air Quality Plan Approval and review of tunnel ventilation systems from the Massachusetts Department of Environmental Protection (MassDEP), and approval from the Massachusetts Water Resources Authority (MWRA) and the Boston Water and Sewer Commission (BWSC) for water and wastewater impacts. The project will also require approval from the Executive Office of Transportation for construction on former railroad land and disposition of railroad land. The project must obtain a Cooperation Agreement with the MBTA and a long-term ground and air rights lease from the MTA. A National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the U.S. Environmental Protection Agency will be required. The project will also require approval from the Federal Aviation Administration (FAA) related to potential height restrictions. Finally, the

project must obtain a variety of approvals from the City of Boston, including but not limited to, Article 80 Large Project Review from the Boston Redevelopment Authority (BRA).

Because the proponent is seeking a land transfer (in the form of leased air rights and ground rights), MEPA jurisdiction is broad and extends to those aspects of the project within the area subject to the land transfer that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations. In this instance, pursuant to 301 CMR 11.01(2)3, MEPA subject matter jurisdiction is functionally equivalent to full scope jurisdiction.

Joint MEPA/BRA Review

The document filed on behalf of the Proponent was a joint Draft Project Impact Report (DPIR) filed in accordance with Boston Redevelopment Authority (BRA) Article 80 requirements and a DEIR filed in accordance with the MEPA regulations (301 CMR 11.00). This document responded collectively to the separate scopes issued by each agency. Subsequent MEPA documents as requested in this scope may include a joint response to corresponding BRA Article 80 information requests, or an independent document that specifically addresses items outlined in this MEPA Certificate.

Project Changes Since the ENF

The project presented in the DEIR reflects modifications made in response to continued meetings with the BRA, the Mayor's Citizens Advisory Committee (CAC), and other members of the community. Changes to the project include increasing the number of on-site residential units (but reducing overall residential square footage), increasing commercial square footage by approximately 48,000 sf, a minor reduction in retail space, and a reduction in private parking spaces from 660 to 590. Building massing, heights and orientation have also been modified since the filing of the ENF. Due to modification in use distribution within the project, water demand and wastewater generation amounts have increased slightly.

Review of the DEIR

The DEIR included a description of the project and characterization of the existing environment. The DEIR has described the current site control status and future easements necessary to achieve the project program. The DEIR provided an updated summary of anticipated federal, state and local permits and approvals.

The DEIR provided an alternatives analysis that described several alternatives including: the original alternative presented in response to the MTA's Response for Proposals (RFP) for Parcel 7, the ENF Alternative, the current Preferred Alternative, a No-Action Alternative, and a No-Garage Alternative. The Proponent has stated that the No-Garage Alternative has been dismissed because of conflicts with urban design principles, traffic impacts, density and massing,

and economic infeasibility. I have requested additional information on the evaluated alternatives as part of the FEIR.

A transportation study was included in the DEIR that conforms to the Boston Transportation Department (BTD) "Transportation Access Plan Guidelines" (1989) and to the EEA/EOTPW Guidelines for EIS/EIT Traffic Impact Assessments. The traffic study contained an analysis and supporting data regarding existing and future conditions of the study area. The traffic study included a description of the existing study area roadway network, existing traffic volumes, crash histories, and existing public transportation, pedestrian, bicycle, parking and loading conditions. To evaluate the potential future impact of the project on transportation resources the DEIR contained information pertaining to project trip generation, mode share, distribution of automobile trips, impacts on truck loading, pedestrian and bicycle trips and parking. An overall transportation operations analysis was provided that discussed levels of service (LOS) for signalized and unsignalized intersections, pedestrians and bicycles. The DEIR included a discussion of a traffic management plan to be implemented during Fenway Park events, including managing traffic into and out of the parking garages, traffic flow through intersections and limiting pedestrian/vehicle conflicts. The DEIR outlined a preliminary program to implement Transportation Demand Management (TDM) measures to reduce the number of vehicle trips to the project site and a description of intersection improvements to mitigate impacts from traffic flows.

The DEIR provided additional information regarding on-site and neighborhood parking demand, the potential loss of parking associated with the project, and the relationship of proposed on-site parking to overall future parking demand in the Kenmore/Fenway area. The DEIR described the proposed Yawkey Station improvements and efforts to coordinate project construction with the separate improvements to Yawkey Station proposed by the MBTA.

The DEIR included analyses of potential wind, shadow, daylight, solar glare and heat loading impacts of the project. The DEIR provided a microscale and mesoscale air quality analysis. The mesoscale analysis was prepared in accordance with MassDEP modeling guidance using the MOBILE 6.2 emission model. The air quality analyses evaluated potential impacts from vehicles traveling to and from the site, as well as parking garage exhaust vents, tunnel ventilation, odors, loading areas, and stationary sources such as heating equipment and generators. The DEIR included a voluntary analysis of potential mobile and stationary greenhouse gas (GHG) emissions and a comprehensive discussion of sustainable design measures to be incorporated into the project.

The DEIR described project impacts on stormwater management, water supply demand and wastewater generation. The DEIR identified the types of stormwater and wastewater discharges from the project site and consistency with disposal requirements. The DEIR discussed measures to be implemented during project design and construction to limit impacts to groundwater resources and pledged to design the project in a manner consistent with City of Boston design requirements.

The DEIR contained a discussion of anticipated construction period impacts, including noise, vibration, dust, odor and traffic flow impacts. The DEIR also included draft mitigation

measures to offset project environmental impacts, draft Section 61 findings, and a response to comments section.

SCOPE

I am allowing the proponent to proceed to the preparation of an FEIR; however I note the requests by commenters for additional information and clarification to assist state agencies with future permitting processes. I anticipate that the FEIR will respond to the scope outlined below with sufficient detail to satisfy state agencies. I retain my authority to require further review in the form of a Supplemental Final Environmental Impact Report if issues outlined in this Scope and in comments (to the extent incorporated in this Scope) are not thoroughly addressed in the FEIR.

General

The FEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Certificate. If a joint document will be filed, the format of the FEIR can be largely determined by the requirements of Article 80, the applicable MOU, any additional scope issued by the BRA and this Certificate. The FEIR should include a copy of this Certificate.

Project Description and Permitting

The FEIR should provide an update on any changes to the project since the filing of the DEIR. This update should include changes to project layout or design, environmental impacts, or additional permitting requirements, as applicable.

Alternatives

Upon review of the DEIR, I have concluded that the analysis of the "No-Garage" Alternative was insufficient and did not meet the requirements set forth for that analysis in the Certificate on the ENF. The DEIR outlined an alternative that proposed an additional 367,000 sf of building space, with associated garaged private parking, in lieu of the proposed public parking garage. The FEIR should present an alternative, and compare potential environmental impacts to the Preferred Alternative, that contains no public or private parking in order to assess the feasibility of such an alternative for the proposed project.

Transportation

A key component of reducing single occupancy vehicle trips to the project site is a robust TDM program. While the project's location is ideal for the success of transit oriented design (TOD), additional measures must be taken to further capitalize on opportunities to reduce vehicle trips and promote alternative forms of transportation. At the request of MassDEP, the FEIR should contain a more comprehensive list of TDM measures (including a consideration of those

recommended in the MassDEP/DEIR comment letter), with clear commitments to their implementation, a description of responsible parties for each measure, and how such commitments will be maintained in the long term. While I note the concern expressed by the Proponent regarding TDM commitments and the unknown nature of future tenants, the success of this project as a true TOD development hinges on measurable and credible TDM measures. The Proponent should commit to an extensive TDM program and require integration of these measures into lease agreements with future tenants. The Proponent should specifically address this requirement as part of the FEIR.

The DEIR has also outlined improvements to several Study Area intersections to offset project-related transportation impacts. These include:

- Installation of a traffic signal system at the Beacon Street/Mountfort Street/Maitland Street intersection;
- Conversion of Mountfort Street from one-way to two-way operation between Park Drive and Buswell Street;
- Addition of bicycle lanes on the Beacon Street corridor between Maitland Street and Kenmore Square, a mid-block pedestrian crossing, and reconstruction of a median island from Maitland Street to just east of the Beacon Street bridge;
- Reconstruction of Maitland Street with an improved horizontal and vertical alignment; and
- Extension of Yawkey Way, including curbside space for multiple bus berths.

Additionally, the DEIR has noted that the improvements to Kenmore Square as part of the MBTA's Kenmore Square Improvement Project and the proposed improvements to the Sears Rotary as part of the U.S. Army Corps of Engineers' Muddy River Flood Damage Reduction and Environmental Restoration Project will improve other intersections impacted by the project. Given the Proponent's reliance on the completion of these projects to effectively mitigate their own project's impacts, the FEIR must discuss how these other traffic improvement projects being undertaken by others will correspond with the Parcel 7 Air Rights phasing and how delays in improvements may impact estimated traffic volumes and intersection function from the Parcel 7 Air Rights project. If necessary, alternative mitigation measures should be presented in the FEIR.

I commend the Proponent for committing to an expansive traffic management plan to be undertaken during Fenway Park events to assist in access and egress to the public parking garage and to manage pedestrian traffic between the project site and Fenway Park. The FEIR should expand upon this plan to specifically address how MBTA bus route schedules may be affected by increased project-related traffic and the traffic management plan itself during events.

The Proponent has made a strong commitment to on-site transit, bicycle, and pedestrian facilities. A commendable off-site mitigation measure is a commitment to construct bicycle lanes on Beacon Street between Maitland Street and Kenmore Square consistent with the Beacon Street Corridor Enhancement project. Additional commitments to accommodate bicycle trips within the project study area should continue to be explored with the Boston Transportation Department (BTD).

Parking

The DEIR included a discussion of both the on-site private and public parking provided, as well as a discussion of the overall parking demand and supply within the Fenway/Kenmore neighborhood. The project includes 590 private parking spaces, provided in accordance with City of Boston parking requirements, and an additional 620 public parking spaces provided within a 700-vehicle capacity above-ground parking structure. The Proponent has provided supporting data outlining existing neighborhood parking supply and the anticipated loss of parking due to future redevelopment opportunities. The DEIR states that as part of the Fenway/Longwood/Kenmore Transportation Study, the Boston Transportation Department (BTD) has stated a goal of maintaining a reservoir of 4,000 parking spaces in close proximity to Fenway Park that are available for games and for patron parking. The Proponent has proposed the 620 public parking spaces in conjunction with this project as replacement parking for anticipated future existing parking loss, in an effort to reach the 4,000 parking space goal set by BTD.

I continue to receive comment letters expressing concern about the potential conflict between a TOD development capable of harnessing all the transportation benefits associated with proximity to a variety of transit uses and the provision of 620 public parking spaces within the project site. While I acknowledge that all visitors to the Kenmore/Fenway neighborhood will not take public transportation or bicycle or walk to the site, the Proponent must provide additional information in the FEIR demonstrating that feasible measures to reduce vehicle trips to the project site will be implemented. In examining ways to minimize the need to drive and park in the area, the FEIR should discuss pricing policies and shuttle bus services to remote parking (as suggested by the Metropolitan Area Planning Council), particularly for Fenway Park events. The mix of uses and the times of peak parking demand should be examined in an evaluation of shared parking, both on-site and in the surrounding area. The DEIR failed to address these scope items as requested in the Certificate on the ENF.

Yawkey Station

The FEIR should provide an update on the MBTA's design plans for the upgraded Yawkey Station. The FEIR should include plans that demonstrate how the Yawkey Station platform will be integrated into the engineering and construction phasing for the Parcel 7 project. The FEIR should clarify access and pedestrian circulation from the station platforms to the proposed public and/or private spaces proposed on-site.

Air Quality

The project exceeds MassDEP's review threshold of 3,000 daily trips for mixed-use projects for an air quality mesoscale analysis of volatile organic compounds (VOCs) and nitrogen oxides (NOx) emission impacts. The DEIR included a mesoscale analysis, which was also used to estimate greenhouse gas (GHG) emissions, notably carbon dioxide (CO_2) emissions from transportation sources. The analysis presented in the DEIR concluded that the project, modeling for a 2012 Build with Mitigation scenario, would account for a 0.13 percent increase in

both NOx and VOC emissions when compared to a 2012 No Build condition. Mitigation measures consist of traffic intersection improvements and TDM measures.

The DEIR indicated that the Proponent has conducted a preliminary evaluation of tunnel ventilation requirements for normal and emergency tunnel operations. The tunnel will extend approximately 900 feet between the Beacon Street and Brookline Avenue bridges. The results of this preliminary study concluded that no mechanical ventilation would be required during normal operations, however during an emergency, ventilation may be required. The proponent should consult with MassDEP and the MTA to determine the applicability of 310 CMR 7.38 to the project. The FEIR should include an updated discussion of the potential environmental impacts of the installation of a mechanical ventilation system and results from the Proponent's meeting with MassDEP and the MTA.

Since the project site sits atop and adjacent to the MassPike, the Massachusetts Department of Public Health (DPH) has noted that potential public health impacts may result from exposure to mobile source emissions. Based upon the DPH comment letter, the FEIR should include additional air quality analyses to demonstrate compliance with the public health standards of the National Ambient Air Quality Standards (NAAQS) for $PM_{2.5}$. This analysis should be prepared subsequent to consultation with the MassDEP regarding study methodology and protocol.

I acknowledge the concerns raised by commenters regarding potential health impacts associated with Ultra Fine Particulates (UFP). However, at this time, there are no recognized national or state-level regulatory programs or standards to measure the potential air quality impacts associated with UFPs. While I will not require a specific air quality analysis of UFPs in the FEIR, the FEIR should outline mitigation measures to be implemented on-site to reduce the potential exposure to pollutants, including UFPs, for occupants of office and residential units. Such mitigation measures may include locating residences as far as possible on-site from primary pollutant sources, installation of state-of-the art air conditioning and filtration systems (along with measures to maintain these systems), modifying building design features, etc.

Greenhouse Gas Policy

The Proponent voluntarily provided an analysis of the project in accordance with the EEA Greenhouse Gas Policy and Protocol. I applaud the Proponent for proposing a project that incorporates numerous innovative sustainable design and operating measures as well as renewable technologies. Mitigation measures to improve building efficiencies presented in the DEIR include: East-West axis building orientation, green roofs and high-albedo roofing materials, a centralized district energy system and combined heat and power (CHP), solar photovoltaics (PV), building envelope measures, and energy efficient elevators. The Proponent has also outlined a goal to make the buildings at least 30 percent more efficient than the Massachusetts Energy Code and to achieve a LEED Sliver rating. I commend the Proponent on these noteworthy ambitions.

The GHG analysis included in the DEIR, prepared using the EQUEST model, estimates a stationary source reduction of CO_2 emissions for the preferred alternative of about 22.5 percent in comparison to the base case (MA Building Code compliant). Mobile sources of CO_2 were reduced by 4.2 percent from the base case to the Preferred Alternative. In the base case, the total CO_2 from mobile and stationary sources was estimated at 4040.3 tons per year (tpy). In the Preferred Alternative, the total CO_2 from mobile and stationary sources was estimated at 3740.7 tpy, for an overall project reduction of 7.4 percent as a result of mitigation measures incorporated into the Preferred Alternative.

The DEIR noted that several of the sustainable design measures are still in the early planning and discovery stages. The FEIR should provide an update on the evaluation and feasibility of sustainable design measures and related measures to reduce project GHG emissions. Furthermore, I encourage the Proponent to clarify what specific, quantifiable elements of the proposed traffic improvements were accounted for in the GHG analysis and identify off-site mitigation measures and their impact on mobile source emissions.

Stormwater

The FEIR should provide supporting data and calculations to confirm the existing and proposed future stormwater runoff quantity and quality estimates presented in the DEIR. The DEIR notes that Low Impact Development (LID) stormwater techniques will be implemented on site. The FEIR should clarify how these LID measures and other Best Management Practices (BMPs) will achieve compliance with the applicable portions of MassDEP's Stormwater Management Regulations for redevelopment projects.

Water and Wastewater

Water Supply

The FEIR should quantify the anticipated water demand (either potable or from rainwater harvesting) for landscape irrigation. The FEIR should clarify how much of the irrigation demand will be met by the rainwater harvesting from rooftops and how they system will be sized to minimize use of potable water for irrigation purposes.

Wastewater

The DEIR indicated that the Proponent will work with the BWSC to participate in the infiltration/inflow (I/I) reduction effort. Assuming a 4:1 ratio is utilized, MassDEP has indicated that the Proponent will need to remove, or cause to e removed, 378,544 gpd of I/I. The FEIR should discuss remedial work planned to meet this I/I removal requirement and make a commitment to an implementation schedule for I/I remediation in accordance with project phasing.

Groundwater

The Proponent should strive to install groundwater monitoring wells on public property and in conformance with the Boston Groundwater Trust (BGT) specifications, with data provided to the BRA and the BGT in a timely fashion. The Proponent should honor its pledge to work with the BGT and the BWSC to develop the best plan result in positive impacts on area groundwater levels.

Historical Resources

In response to the Certificate on the ENF, the DEIR included a discussion of the potential impact of the project on historic properties. This response was prepared as part of the Article 80 review process and included a description of potential wind, shadow and visual impacts of the project. The Massachusetts Historic Commission (MHC) indicated that the DEIR adequately identified and mapped the historic properties within the area of potential effect of the project. However, the DEIR did not contain information responding to a request for 3-D or computer model graphics to evaluate visual impact, despite a statement in the DEIR saying that they would be provided during the comment period. As such, MHC has opined that the visual analysis is inadequate and the MHC is unable to make a determination of effect for the project. I understand that the Proponent has forwarded 3-D renderings to MHC for their consideration. I expect that these renderings will be included in the FEIR along with a discussion of any additional coordination efforts with MHC on the project.

Construction Period Impacts

The FEIR should clarify how the project's construction process can be sequenced and staged to limit impact on shuttle bus activity originating from the project site to connect to the Longwood Medical Area (LMA). The FEIR should describe how the LMA shuttle will continue to be accommodated on-site throughout the construction process. While pedestrian signage can convey flows from the Yawkey Station, it remains unclear how shuttle operations will function. The FEIR should clarify during what phase of construction certain uses (i.e. parking) may be temporarily or permanently removed from the project site, and how and where such impact (particularly LMA parking) will be mitigated. It remains unclear if parking generally used by LMA employees (and Fenway events) will be eliminated in their entirety during the extended construction period. While the DEIR addressed traffic management planning techniques to be implemented during Fenway events in a post-construction condition, the FEIR needs to expand upon this plan to specifically address how to mitigate construction period impacts during activities at Fenway Park.

Mitigation

The FEIR should include a separate chapter updating commitments to project-related mitigation. This section should include a summary of mitigation commitments as well as draft

Section 61 finding language for use by state agencies during each individual permitting process. The updated Section 61 findings should specify in detail all feasible measures the proponent will take to avoid, minimize and mitigate potential environmental impacts to the maximum extent practicable. Section 61 findings should identify and clarify parties responsible for funding and implementation, and the anticipated implementation schedule that will ensure mitigation is implemented prior to or when appropriate in relation to environmental impacts.

Comments/Circulation

The FEIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the FEIR should include a response to comments. This directive is not intended to, and shall not be construed to, enlarge the scope of the FEIR beyond what has been expressly identified in the initial scoping certificate or this certificate.

The FEIR should be circulated in compliance with Section 11.16 of the MEPA regulations. Copies should be sent to any state agencies from which the proponent will seek permits or approvals, to the list of "comments received" below, and the local branch of the Boston Public Library.

November 14, 2008
Date

Ian A. Bowles

Comments received:

08/27/08	Boston Fire Department
09/19/08	Boston Groundwater Trust
10/29/08	Fenway CDC
10/31/08	Massachusetts Department of Public Health
11/03/08	MASCO
11/06/08	Massachusetts Historical Commission
11/07/08	Massachusetts Department of Environmental Protection – NERO
11/07/08	Metropolitan Area Planning Council
11/07/08	Metropolitan Highway System Advisory Board
11/10/08	Shirley Kressel
11/10/08	Ned Flaherty

IAB/HSJ/hsj

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
205B Lowell Street, Wilmington, MA 01887 • (978) 694-3200

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

November 7, 2008

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Boston
Massachusetts Turnpike Parcel 7 Air Rights,
Kenmore/Fenway Area
EEA # 14163

Attn: MEPA Unit

Dear Secretary Bowles:

The Massachusetts Department of Environmental Protection (MassDEP), in collaboration with the Division of Energy Resources in the Executive Office of Energy and Environmental Affairs (EEA-DOER) has reviewed the Draft Environmental Impact Report (DEIR) submitted by Meredith Kenmore/Fenway Development Group, LLC to construct a mixed use project in four buildings with housing (313,558 square feet (sf)), office (387,047sf), and retail uses (92,461 sf), totaling about 803,770 square feet on a 3.63 acre site, which includes an area over Interstate 90 between Beacon Street and Brookline Avenue in Boston (EEA #14163). Parking for 1,290 vehicles also is proposed in two parking garages. The Department provides the following comments.

Wastewater

The DEIR indicates that there is sufficient capacity in the existing collection system to accommodate the estimated 94,636 gallons per day of new wastewater flow from the Massachusetts Turnpike Parcel 7 Air Rights, Kenmore/Fenway Area project. This is an increase in flow from the ENF, which estimated that the project would generate 86,833 gallons per day. Wastewater generated by the project will discharge into the Boston Water and Sewer Commission (BWSC) sewer system, which flows into the MWRA system and ultimately to the Deer Island Wastewater Treatment Facility.

The DEIR indicates that the Massachusetts Turnpike Parcel 7 Air Rights, Kenmore/Fenway Area project would work with the BWSC to participate in the I/I reduction effort. Assuming that a 4:1 ratio is utilized, and adjusting for the increase in wastewater generated, the proponent now will need to remove, or cause to be removed, 378,544 gpd of I/I.

Information on the I/I remedial work planned and a commitment for an implementation schedule is requested in the FEIR.

Air Quality - Mobile Source/Transportation Comments

The projected new daily vehicle trips exceed MassDEP's review threshold of 3,000 daily trips for mixed-use projects for an air quality mesoscale analysis of volatile organic compounds (VOCs) and nitrogen oxides (NOx) emission impacts. The mesoscale analysis also was used to estimate greenhouse gas (GHG) emissions, specifically, CO_2 from transportation sources. The proponent submitted the GHG analysis to comply with the MEPA GHG Policy, in response to MEPA's February 22, 2008 Certificate on the ENF. The Policy requires project proponents to quantify carbon dioxide (CO_2) emissions and identify measures to avoid, minimize, and mitigate these emissions.

The mesoscale analysis of the proposed project for all three pollutants included four conditions consisting of Existing, 2012 No Build conditions, 2012 Build, and 2012 Build with Mitigation project conditions.

Mesoscale Analysis

The mesoscale analysis determines the extent to which the proposed project would increase the amount of VOCs and NOx emissions in the project study area. In addition, the analysis helps identify mitigation measures, such as roadway improvements to ease traffic congestion and Transportation Demand Management (TDM) to reduce project related trips and associated emissions.

The mesoscale analysis predicted VOC and NOx emissions using the current USEPA emission model (MOBILE 6.2) and traffic flow conditions for the respective Existing, 2012 No Build conditions, 2012 Build, and 2012 Build with Mitigation conditions. The modeling results indicate a 3.12% increase of NOx and VOC emissions under the 2012 Build condition compared to the 2012 No Build condition. To address the increase, the 2012 Build with Mitigation condition contains certain traffic mitigation measures and TDM measures. The DEIR concludes that the Build with Mitigation condition accounts for a 0.13% increase in both NOx and VOC emissions when compared to the 2012 No Build condition, (Table 5.6-3, page 5-73 for a summary of emissions data).

Greenhouse Gas Analysis Mobile Sources

The mesoscale analysis described above also is used to estimate the indirect emissions from transportation CO_2 emissions associated with the additional project related vehicle trips. The GHG calculations compared CO_2 emissions for the same conditions and study area, i.e., Existing, 2012 No-Build, 2012 Build, and 2012 Build with Mitigation conditions. Table 5.7-3 provides the results of the GHG analysis of indirect emissions from transportation. The 2012 Build with Mitigation condition is estimated at 106,662 tpy (139 tpy higher), which is a 0.13 percent increase in CO_2 compared to the No Build condition (106,523 tpy).

The GHG emission reductions attributed to mitigation are the proposed traffic improvements at Audubon Circle, Kenmore Square, and Beacon Street at Mountfort Street. The DEIR does not clearly identify the specific, quantifiable elements of the proposed traffic

improvements that are accounted for in the GHG analysis. In addition, the DEIR does not clearly identify the responsible party for these specific measures. Given the considerable infrastructure improvements planned by the Commonwealth in the project study area, the next EIR should clearly identify the project obligations to off-site mitigation and quantify their impact on mobile source emissions.

The proponent's commitment to on-site transit, bicycle, and pedestrian facilities is considerable. The one clearly identified off-site measure by the proponent is a commitment to contribute to support elements of the Beacon Street Corridor Enhancement namely bicycle lanes on Beacon Street between Maitland Street and Kenmore Square. The DEIR section 4.3.6 indicates there are no designated bicycle lanes or paths due to the existing street widths in the study area, but does not acknowledge the one-mile bicycle lane on the recently reconstructed Commonwealth Avenue segment terminating in Kenmore Square through which 45 percent of project related AM peak auto trips will travel, according to the DEIR. Because bicycle lanes and related amenities support bicycle commuting, which can reduce auto trips, MassDEP strongly encourages the proponent to work with the Boston Transportation and Environment Departments to explore expanding lanes and accommodations for bicyclists within the project study area.

Need for Additional Mitigation

MassDEP believes that an enhanced mitigation package designed to reduce vehicle miles traveled (VMT) would be effective in further reducing VOC, NOx, and CO_2 emissions generated by the proposed project, because the project has a tremendous opportunity to further reduce site generated trips and resulting emissions. This transit oriented development (TOD) project location is ideally suited to take full advantage of the substantial, publically funded infrastructure improvements planned for the area. The air quality and transportation mitigation commitments described in the DEIR include posting 'no idling' signs at the drop off area and a reference to a traffic demand management (TDM) program which lists several potential mitigation measures. MassDEP recommends the subsequent filing contain a more comprehensive list of TDM measures which will be implemented. MassDEP seeks clarity regarding the responsible party for each TDM measure. The project also should provide further detail on how TDM measures will be implemented and maintained long term.

A key element of the proposed project should be the linkage to nearby transit facilities. The project proximity to the MBTA Yawkey Station, Kenmore, and Fenway Stations should be maximized to the extent possible. The project proponent should work closely with the MBTA and area shuttle service providers to maximize transit usage and take full advantage of the unique TOD aspects of the project location. Note the DEIR page 4-15 incorrectly describes the MBTA bus Route 57 via "Newton Center;" the subsequent filing should correct the routing description to read "Newton Corner."

Recommended Transportation Demand Management (TDM) Measures

The project proponent also should consider implementing the following measures to further reduce vehicle trips within the project study area.

- *Commuter Tax Benefit Program* - MassDEP recommends that the proponent support a transportation tax benefit program to encourage employees to take transit considering the

availability of transit and bus services near the project site, or vanpools to work. This program provides the added benefit of decreasing taxes for employers and employees.

- *Rideshare-Matching Program* - MassDEP recommends that the proponent establish a rideshare-matching program to match employees in carpools and/or vanpools. The project proponent could also enlist the services of a third-party provider to carry out this program.

- *Guaranteed Ride Home Program* - MassDEP recommends that the proponent establish an emergency ride home program for all project employees who travel by carpools/vanpools.

- *Additional Bicycle Incentives* - MassDEP recommends that the proponent consider security and weather protection in placing any outdoor short or long term bicycle parking.

- *BikeShare* - MassDEP recommends that the proponent consider providing a bicycle rental program designed to accommodate occasional bicycle needs of tenants, employees, residents, and visitors.

- *Parking Management* - MassDEP recommends that the proponent develop a parking management program to minimize parking requirements such as parking cash-out, parking charges, limiting parking for employees, preferential carpool and vanpool parking.

Required Measures

In addition to the recommendations listed above, the proponent also must meet the following required measures.

Compliance with the Massachusetts Idling Regulation

MassDEP is pleased with the commitment to comply with the Massachusetts Idling regulation, (310 CMR 7.11). This regulation prohibits motor vehicle engine idling for more than five minutes unless necessary to service the vehicle or to operate engine-assisted power equipment, (such as refrigeration units), or other associated power. The proponent should post idling restriction signs in all loading and drop-off areas within the site to remind all drivers, patrons, and delivery personnel of the state's idling regulation. Questions regarding this regulation should be directed to Julie Ross of MassDEP at 617-292-5958.

Compliance with the Massachusetts Rideshare Regulation

MassDEP also is pleased to see the commitment to comply with the Rideshare regulation, (310 CMR 7.16), which applies to employers with 250 or more daily employees. Employers subject to the Rideshare Program must implement a series of incentives, designed to reduce the number of trips made by employees who drive alone to work. To date, employers with 1,000 or more employees and employers with 250 or more employees that also are subject to the Air Operating Permit Program (as detailed in MassDEP regulation, 310 CMR 7.00, Appendix C) must comply with the Rideshare regulation. Questions regarding this regulation should be directed to MassDEP's Rideshare Helpline at 617-292-5663.

Construction Period Air Quality Mitigation Measures

MassDEP recommends that project proponent require all project contractors install after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). MassDEP commends the project proponent for committing to installing these devices to reduce engine emissions. MassDEP's guidance document, "Diesel Engine Retrofits in the Construction Industry – A How to Guide," is available on MassDEP's website at http://www.mass.gov/dep/air/diesel/conretro.doc. Additional questions or help can be directed to Gary Rennie of MassDEP at 617-292-5869.

The mitigation commitments in the DEIR, page 10-5, state that the proponent's intention to "(e)ncourage the use of low sulfur diesel fuel in off road and on road engines." The proponent should be aware that as of June 2007, all standard off-road diesel fuel must use low sulfur diesel (LSD) fuel with no more than 500-ppm sulfur; the maximum sulfur level in off-road fuel will be reduced to 15 ppm by 2010. Concerning on-road diesel vehicles, the proponent is required by law to use ultra-low sulfur diesel (ULSD) fuel with no more than 15 ppm sulfur. Because of the current availability of ULSD, MassDEP recommends the early use of ULSD fuel to reduce additional amounts of fine particulate matter, which is associated with the state's high incidence of asthma and is a probable carcinogen.

Tunnel Ventilation Requirements

The DEIR indicates that the proponent has conducted a preliminary evaluation of tunnel ventilation requirements for normal tunnel operation and emergency conditions and will consult with MassDEP and Massachusetts Turnpike Authority (MTA) to evaluate these results and determine the applicability of 310 CMR 7.38. MassDEP encourages the proponent to contact the agencies prior to the subsequent filing to address the matter of tunnel ventilation and applicability of tunnel ventilation system regulation 310 CMR 7.38.

Greenhouse Gas Emissions Analysis- Stationary Sources

The DEIR provides a greenhouse gas analysis, using the EQUEST model, demonstrating that the LEED GHG Mitigation scenario, the preferred alternative, has a higher reduction in CO_2 emissions, when compared with the Building Code compliant and the Enhanced Design alternatives. The total reduction on CO_2 emissions for stationary and mobile sources of CO_2 is estimated to be about 7.4 percent less than the base case alternative. The stationary direct and indirect annual CO_2 emissions for the code compliant base case are estimated at 449,804 lbs and 978,735 lbs, respectively. The Enhanced Design alternative emissions are estimated at 297,355 lbs of CO_2 for direct and 843,780 lbs of CO_2 for indirect sources; and the LEED GHG Mitigation alternative emissions estimates for direct and indirect sources are 303,550 lbs of CO_2 and 803,858 lbs of CO_2, respectively. Combined, the stationary source reduction of CO_2 emissions for the preferred alternative is about 22.5 percent less than the base case. The following table presents a tabulation of mobile and stationary source CO_2 emissions to show the total reduction in the increase in GHG emissions that could be achieved with the GHG Mitigation alternative, when compared with the MA Building Code compliant alternative. A summary table of GHG mitigation effectiveness is useful to reviewers in understanding the relative improvements achievable with mitigation. Data from the table were used in this comment.

LEED GHG Alternative Summary of Reduction in CO_2 Increases with Mitigation

	Build (MA Building Code compliant)	LEED GHG Alternative	**Percentage Reduction for Build with Mitigation from Code Compliant Build**
Mobile Source Tons/yr CO_2	3,326	3,187	**4.2**
Stationary Source (direct & indirect) Tons/yr CO_2	1,428,539 [1] lbs CO_2/2,000 lbs = 714.3 tpy	1,107,408 lbs CO_2/2000 lbs = 553.7 tpy	**22.5**
Totals (Mobile + Stationary)	**4040.3**	**3740.7**	**7.4**

DOER has reviewed the DEIR and commends the project proponent for the numerous mitigation measures they are considering related to building energy efficiencies. These include East-West axis building orientation, green roofs and high-albedo roofing materials, a centralized, district energy system and combined heat and power (CHP), solar PV, building envelope measures, and energy efficient elevators. DOER also notes the proponents commendable goal to make buildings at least 30 percent more efficient that the MA Energy Code. It is requested that the FEIR expand on the evaluation of renewable energy sources under consideration for the project to understand the issues that influence decision-making. Should these measures be feasible, the proponent may be able to take advantage of the economic recovery package credits for combined heat and power system property, small wind energy property, and geothermal heat pump systems, which will be available through 2016. DOER hopes that as many of these measures as possible are able to be implemented and looks forward to the subsequent filing and learning how the project evolves.

The proponent's goal is to achieve a LEED Silver rating. Building performance averages are 25-30 percent more efficient for LEED certified buildings than non-LEED buildings, and gold-platinum LEED rated buildings are 45 percent better than the national average, according to a study from the New Buildings Institute (NBI). Therefore, if feasible to adopt additional the LEED energy efficiency measures, it is conceivable that the project could exceed the estimated 22.5 percent reductions in emissions, reported in the DEIR, compared with the MA Building Code compliant alternative's greenhouse gas emissions. The economic recovery package adopted by Congress extends the Commercial Building Tax Deduction (CBTD) for five years, through 2013, which allows building owners to claim a deduction of up to $1.80 per square foot of the property, for energy efficiency improvements in interior lighting, HVAC, and building envelope systems. This five-year extension may make it more cost-effective for the proponent to add efficient designs and measures not included in the mitigation package described in the DEIR.

[1] The value was calculated by adding pounds of CO_2 for direct and indirect emissions, taken from Table 5.7-2

It appears that the category kilowatts percent reduction in Table 5.7-2 should be changed to percentage of tons of CO_2 reduction in the FEIR. Clarification of a Table in Appendix E, (GHG Policy Analysis), apportions six energy efficient measures to the alternatives evaluated. However, only five measures are listed, and it is unclear why envelope improvement measures were not included in the GHG reduction alternative, consistent with the description of the LEED GHG Mitigation alternative (page 5-82).

Water Conservation

Although the main sources of GHG, from this project are associated with building heating and cooling, lighting, and vehicle travel, the energy required to provide potable water and treat wastewater also will be a source of GHG, and in particular CO_2. To gain an understating of the correlation between water/wastewater volumes and energy use requirements, MassDEP has reviewed data and information from the MWRA and estimates the average energy use for wastewater treatment at their Deer Island facility is 1.2 - 1.4 kWh/kgal. As indicated previously, the proposed development will generate approximately 94,636 gallons of wastewater per day or 34,542,140 approximately million gallons per year. Using an average energy cost of 1.3 kWh/kgal, the project will require approximately 44,905 kWh over the course of a year. The project proponent should consider this additional energy use when proposing measures to mitigate the additional GHG emissions that will result from treating wastewater from this proposed project.

In addition, the MWRA estimates that treating and transporting drinking water at their John Carrol Water Treatment Plant requires 0.14 to 0.23 kWh/kgal. This is slightly less than the estimated 0.3 kWh/kgal required to treat and transport drinking water at the Worcester Water Filtration facility. As the proposed project will require 114,600 gallons of potable water per day, or 41,829,000 gallons per year, and using energy costs of about 0.2 kWh/kgal, approximately 8,366 kWh will be required to supply the proposed project with potable water annually. In considering mitigation for wastewater, the project proponent also should consider the additional energy use from providing potable water for this proposed project.

The Department commends the proponent for proposing rainwater harvesting to help reduce potable water demand. However, there is no estimated reduction in water use for landscape irrigation as a result of rainwater harvesting. How will the system be sized in proportion to the available rooftop areas, and will all irrigation needs be met or exceeded with rainwater? As LEED certification allows up to seven points for rainwater harvesting systems, including a point each for reducing water savings by 20, 30, and 40 percent, there is an added incentive to enhance the RWH system to garner as many points as practicable.

Rainwater harvesting systems are being used as a source of water for toilets, urinals, water features, cooling towers, and secondary fire suppression. Therefore, the Department requests reconsideration of the rainwater collection system design and siting. If a commitment to an expanded RWH system cannot be made, information should be presented to show that an expanded system would be technically infeasible and/or not cost-effective over the lifetime of the project.

The low-flow fixtures and equipment that will be installed to reduce water demand also should be identified. Using USEPA's WaterSense website at http://www.epa.gov/owm/water-

efficiency/, it also should be possible to affirm that at least 20 percent savings would be achieved with the plumbing fixtures and equipment selected. To achieve water and energy savings goals, consideration also should be given to using HVAC equipment with advanced evaporator coils, which have been reported to reduce water loss by about 50 percent and energy demand by up to 25 percent.[2] Other mitigation measures appropriate for reducing energy use for water and wastewater are water distribution system improvements to eliminate un-accounted for water losses and infiltration and inflow (I/I) removal from sewer mains, which also is required to offset wastewater generated by the project which has the potential to increase sewer and combined sewer overflows.

The MassDEP and EEA-DOER appreciate the opportunity to comment on this proposed project. Please contact the staff listed for further information on the issues. If you have further questions on GHG issues, the MassDEP contact is Philip.Weinberg@state.us, (617) 292-5972, and the DOER contact is Meg.Lusardi@state.ma.us, (617) 626-7364. Please contact Jack Zajac at (978) 694-3240 for further information on the wastewater issues. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Meg Lusardi, EEA-DOER
Phil Weinberg, Christine Kirby, Jerome Grafe, MassDEP-Boston
Richard Chalpin, Kevin Brander, Jack Zajac, MassDEP-NERO

[2] *Greener Pastures for America's Homebuilders?* Calvert Group, LTD. with collaboration from the Boston College Institute for Responsible Investment. March 2008.

The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
Bureau of Environmental Health
250 Washington Street, Boston, MA 02108-4619
Phone: 617-624-5757 Fax: 617-624-5777
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H2

October 31, 2008

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

Dear Secretary Bowles:

The Massachusetts Department of Public Health/Bureau of Environmental Health appreciates the opportunity to comment of the Draft Project Impact Report/Draft Environmental Impact Report (DPIR/DEIR) for the Massachusetts Turnpike Parcel 7 Air Rights Kenmore/Fenway Area (EEA # 14163). The DPIR/DEIR is intended to assess the impacts of the construction and operations of a new mixed use development with residential units (over 313,000 square feet (sf)), commercial (over 387,000 sf), and retail uses (over 92,000 sf) in four buildings, totaling over 803,000 square feet on a 3.63 acre site. Parking for 1,290 vehicles also is proposed in two parking garages. The location of the development is between Beacon Street and Brookline Avenue and includes air-rights space over Interstate 90/Mass Pike.

According to the DPIR/DEIR, the air quality impacts evaluated in the DPIR/DEIR primarily are based on the predicted emissions from an estimated 5,400 new vehicle trips per day (vtd) using the MDEP Indirect Source Air Quality Analysis. This analysis is intended to assess emissions that are produced by sources not directly related to the operations of the facility and are usually related to vehicles traveling to and from the site of a project.

According to the DPIR/DEIR, two air quality analyses were conducted:

- a microscale analysis of predicted carbon monoxide (CO) emissions at nearby intersections, predicted CO emissions from parking garage exhaust vents, predicted NO_2, SO_2 and PM10

emissions from mechanical equipment, and particulate matter (PM10) emissions associated with diesel trucks operating at a loading dock.[1]

- a mesoscale analysis that is required when projects exceed 3000 vehicle trips per day was also conducted to estimate VOC and NOx emissions from new vtd.

The Proponents concluded that health concerns associated with increased air pollution resulting from the proposed project were addressed by analyzing the following:

For the microscale analysis:

- CO (1- and 8-hour) maximum concentrations for all sources (parking garage exhaust vents, loading dock, stationary source equipment (heating and emergency generators) and concentrations at nearby intersections were added to background monitored levels and compared to the 1- and 8-hour National Ambient Air Quality Standard (NAAQS) for CO.

- PM predicted concentrations at receptors associated with 114 delivery trips per day (loading/unloading and idling for up to 5 minutes) were added to background monitored concentrations and compared to the PM10 24-hour NAAQS of 150 $\mu g/m^3$ and annual PM10 NAAQS of 50 $\mu g/m^3$.[2]

- Comparison of predicted concentration from mechanical equipment and loading dock emissions plus monitored background concentrations were evaluated for NO_2, SO_2, and PM10 and compared to NAAQS.

For the mesoscale analysis,

- The impacts were based on the percent difference in tons per day between the build and no-build scenarios.

A substantial body of evidence from epidemiological studies has found strong positive and statistically significant associations between the exposure to traffic-related pollutants near roadways (<300 meters) and adverse health outcomes in both children and adults, particularly individuals with preexisting respiratory and cardiovascular diseases. These studies have evaluated exposure to the complex mixture of traffic-related pollutants emitted from mobile sources with a particular focus on fine and ultrafine particles. For example, an expanding body of evidence has reported increases in respiratory symptoms, allergic sensitization, and elevated risks for the development of asthma in children exposed to motor vehicle emissions.[3] Associations have also been observed between long-term exposure to traffic-related pollutants, including ultrafine particles, and the risk of heart attack, reduced survival after heart failure, increased risk of coronary heart disease, particularly fatal events.[4] In fact, a recent study conducted by our office in the Merrimack Valley area of our state demonstrated that children living within 200 meters of high-density traffic areas in that area of the

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[1] Emissions from mobile sources were estimated using EPA's MOBILE 6.2 model. The CAL3QHC model was used to estimate concentrations at receptors at several intersections near the proposed facility and SCREEN3 was used to estimate ground-level impacts of emissions from the parking garage, loading dock and stationary sources.

[2] NOTE: Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the EPA revoked the annual PM_{10} standard, effective December 17, 2006.

[3] McConnell et al., 2006; Nordling et al., 2008, Morgenstern et al., 2008

[4] Tonne et al., 2006, Brugge et al., 2007

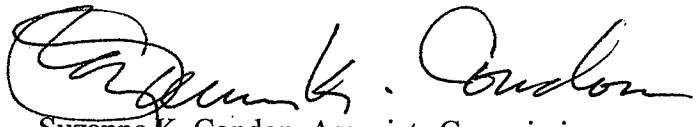
state had statistically significant higher rates of pediatric asthma (MDPH/BEH, 2007). Thus, given these documented health impacts from exposure to mobile source emissions, the location of this mixed-use development at the intersection of several major roadways (e.g., Brookline Avenue, Commonwealth Avenue, Beacon Street) and above Interstate 90/MassPike, and the anticipated public access to the proposed commercial, retail and residential areas, we believe that more information is needed in the air quality analysis to ensure that both short- and long-term health impacts related to this development are, in fact, not a public health concern as concluded in the current draft report.

For example, based on the air quality analysis presented in the DPIR/DEIR, the potential health impacts associated with fine particle emissions from mobile sources have not been considered. These data are generated by the MOBILE6.2 inventory module that was used in the air quality analysis to generate CO, NOx and SO_2 and PM10 emissions. Since the primary particles emitted from both gasoline and diesel engines are not PM10 but fine and ultrafine particles[5], it is critically important that the relevant size of particles emitted from mobile sources be considered in the analysis. In addition, all sources of exposure to mobile source emissions need to be aggregated and considered in the analysis including motor vehicle emissions associated with the increase in vehicles traveling to and from the new development as well as emissions associated with Interstate 90/Mass Pike, emissions from tunnel exhaust, emissions from parking garages, and diesel emissions associated with locomotives and diesel trucks servicing the facility.[6] Although background exposures were considered, the monitoring data that were used does not adequately consider the cumulative effects of all of these sources or the higher concentration gradient near the roadways.

Finally, given the many benefits of the proposal to the community, we believe that a more accurate assessment of health impacts associated with this proposal will significantly improve and target cost-effective mitigation efforts (e.g., incentives to reduce motor vehicle use, enhanced building design, and installation of filters for tunnel exhaust) that will reduce the potential for health impacts associated with exposure to mobile source emissions.

Thank you for your consideration of these comments. If you have any questions, please call me at 617-624-5757

Sincerely,



Suzanne K. Condon, Associate Commissioner
Director, Bureau of Environmental Health

[5] Vehicle exhaust typically contains few particles larger than 2 microns (Jiang P, Lignell DO, Kelly KE, Lighty JS, Sarofim AF, Montgomery CJ. 2005. Simulation of the evolution of particle size distributions in a vehicle exhaust plume with unconfined dilution by ambient air. J Air Waste Manag Assoc. 2005 Apr;55(4):437-45.

[6] Impacts from ventilation from the proposed tunnel above Interstate 90/Mass Pike were not analyzed and locomotive exhaust was only analyzed for odor strength.

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Nordling E, Berglind N, Melen E, Emenius G, Hallberg J, Nyberg F, Pershagen G, Svartengren M, Wickman M, Bellander T. 2008. Traffic-related air pollution and childhood respiratory symptoms, function and allergies. *Epidemiology.* 19(3):401-408.

Tonne T, Melly S, Mittleman M, Coull B, Goldberg R, Schwartz J. 2007. A case-control analysis of exposure to traffic and acute myocardial infarction. *Environmental Health Perspectives* 115(1):53-57.

The federal Clean Air Act requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) (NAAQS) for pollutants considered harmful to public health and the environment. EPA has set standards for six principal pollutants, which are called "criteria" pollutants. These criteria pollutants are: carbon monoxide (CO), oxides of nitrogen (NOx), ground-level ozone (O3), lead (Pb), sulfur dioxide (SO2), and particulate matter (PM).

The Clean Air Act established two types of NAAQS. Primary standards set limits within an adequate margin of safety to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards are for the protection of public welfare from any known or anticipated adverse effects such as decreased visibility, and damage to wildlife, crops, vegetation, and buildings.

As discussed previously in this Section (Section 5.6), an air quality analysis has been performed for the Project that considered both the Project's indirect sources (*i.e.* mobile traffic sources) and its stationary sources (*i.e.*, the Project's mechanical equipment). Both the indirect and stationary source analyses were conducted using EPA and DEP approved air dispersion models for the criteria pollutants as defined by the EPA and DEP. Mobile air quality analyses considered carbon monoxide (CO) and stationary sources analyzed CO concentrations along with nitrous oxide (NOx) particulate matter (PM), and sulfur dioxide (SO2).

The air quality analysis results show that CO, NOx, PM, and SO2 concentrations at all modeled receptors, studied in accordance with EPA and DEP modeling guidelines, are well under the NAAQS thresholds which EPA established for protecting public health and welfare. Additional dispersion modeling to determine NAAQS compliance will be done as part of the DEP's permitting process to analyze emissions from the Turnpike tunnel should mechanical ventilation be installed in the tunnel.

As discussed in Chapters 4 and 6, the Project includes numerous mitigation measures aimed at reducing air pollutants, including a robust Transportation Demand Management (TDM) component, and the use of alternative energy sources to help reduce the need to burn fossil fuels. The Project also includes measures to reduce air pollution during construction such as requiring the use of diesel retrofits on construction equipment.

5.7 Greenhouse Gas Emissions Analysis

5.7.1 Introduction

In response to the Secretary's Certificate on the ENF (see Appendix A), which requested that the Proponent voluntarily comply with the EEA's Greenhouse Gas (GHG) Emissions Policy, the Proponent has performed an analysis examining the proposed Project's greenhouse gas emissions and compared them to other alternatives.

EEA's GHG Policy addresses direct emissions from stationary sources (*e.g.*, fossil fuel emissions from on-site furnaces), indirect emissions from energy consumption (*e.g.*, fuel usage for generation of electricity powering the Project), and indirect emissions from transportation (carbon dioxide (CO_2) emissions from vehicles used by employees, vendors and customers).

The GHG Policy addresses only CO_2 emissions. With respect to the Project, CO_2 is considered the only significant greenhouse gas. To provide for consistency in the analysis, indirect emissions from transportation are limited to the mesoscale study area (see Section 5.6.2), and no consideration is given to offsets at this time.

5.7.2 Methodology

The GHG Policy requires project proponents to calculate and compare GHG emissions associated with: 1) a code-compliant baseline (Code Baseline); 2) the preferred alternative (Enhanced Design Alternative); and 3) project alternatives with greater GHG emissions-related mitigation than the preferred alternative (LEED GHG Mitigation). For all cases, the GHG emissions are calculated by estimating direct emissions from stationary sources, indirect emissions from energy consumption, and indirect emissions from Project generated traffic.

The Proponent has created the requested 3-tier GHG emission comparison, however, the Proponent stresses that its Project Alternative with greater GHG emissions related mitigation (LEED GHG Mitigation) strives for the highest-possible level of GHG reductions. The Project is committed to the LEED GHG Mitigation scenario and it is the preferred condition. Scenario 2 (Enhanced Design) reflects a condition considerably better than the base case and results in GHG reductions. The Enhanced Design condition will be used for comparison to the code-compliant baseline case.

Annual energy consumption was estimated by Cosentini Associates using the eQUEST model for a variety of operating conditions by varying the energy efficient measures (EEM). Appendix E provides the results of the eQUEST modeling for each condition. For this analysis, three of the six conditions modeled were chosen to represent the 3-tier GHG comparison. From the modeling analysis, Alternative 1 denotes the Code Baseline condition, Alternative 5b denotes the Enhanced Design, and Alternative 6b denotes the preferred alternative LEED GHG Mitigation condition.

As discussed in Section 6.0, the Proponent has identified and is committed to numerous sustainable design elements for the Project. The Proponent is also still evaluating the feasibility of incorporating *additional* design elements to further mitigate GHG emissions. The additional elements being evaluated are renewable resources (*e.g.* wind, solar, geothermal) along with incorporating a central heating plant (CHP) to provide more efficient heating, cooling, and electricity to the Project.

Table 5.7-1 provides the assumptions built into the direct and indirect source modeling for the Code Baseline, the Enhanced Design and the LEED GHG Mitigation conditions. The modeling looked at five energy efficiency measures:

1. Improved Lighting – The lighting power density was reduced by 15 percent as compared to the code maximum allowable lighting power density.

2. Overhangs – Window overhangs were provided based on the schematic architectural drawings.

3. Improved Building Envelope – This assumes the wall, roof, shading coefficient, and glazing U-values were reduced by 15 percent compared to the building code limits.

4. Condensing Boilers – Conventional boilers rated at 80 percent efficiency were replaced with more efficient condensing boilers at 88 percent efficiency.

5. High Efficiency Chillers (Central Chiller Plant) - Standard chillers at 0.676 kW per ton were replaced by a Central Chiller Plant with more efficient chillers at 0.55 kW per ton.

Table 5.7-1 GHG Study Baseline Case Modeling Assumptions

Code Baseline Condition
The building envelope uses the minimal compliant performance data set forth in 780 CMR 1304.
The glazing percentage of the baseline building is based on the maximum glazing percentage for baseline comparison as described in Appendix G of ASHRAE 90.1-2004. The glazing percentage assumed was 40 percent.
The lighting densities used are the maximum allowable lighting densities provided in 780 CMR 1308.
The efficiencies of the MEP systems are the minimum allowable efficiencies in 780 CMR 1305.
The HVAC systems are based on the baseline HVAC systems in Appendix G of ASHRAE 90.1 (Table G3.1.1)
Enhanced Design Condition
U values for walls, windows, and roofs were reduced by 15 percent over code compliant condition along with window glazing reduction of 15 percent over the code compliant case.

Table 5.7-1 GHG Study Baseline Case Modeling Assumptions (Continued)

More efficient condensing boilers (88 percent efficient) were incorporated replacing the conventional boilers (80 percent efficient) in the code compliance condition.
A high efficiency central chilled water plant is assumed replacing the standard chillers assumed in the code compliance condition.
LEED GHG Mitigation Condition
Lighting power density is reduced by 15 percent over the code compliance condition.
Exterior window overhangs were incorporated.
U values for walls, windows, and roofs are reduced by 15 percent over code compliant condition along with window glazing reduction of 15 percent over the code compliant condition.
More efficient condensing boilers (88 percent efficient) were incorporated replacing the conventional boilers (80 percent efficient) in the code compliance condition.
A high efficiency central chilled water plant is assumed replacing the standard chillers assumed in the code compliance condition.

5.7.3 Direct emissions from Stationary Sources

Calculation of direct emissions from stationary sources comprises the first part of the GHG Policy. For each of the conditions, this requires an assessment of the on-site energy requirements of the Project, including energy losses owing to heat loss and gain. As specified by the GHG Policy, energy modeling tools were used to estimate the energy demand for each condition. For this analysis the eQUEST model was used to estimate energy demand for each of three conditions. The estimated heating requirements predicted by eQUEST for each condition were multiplied by the ISO-New England average emission factor to determine CO2 emissions in tons per year.

5.7.4 Indirect Emissions from Energy Usage

Calculation of indirect emissions comprises the second part of the GHG Policy. Indirect emissions result from the purchase and consumption of electricity by the Project. The electrical demand is affiliated with the lighting, building cooling, ventilation, and the operation of ancillary equipment (*i.e.* vents, fans, pumps, etc.). The GHG emissions associated with the electrical demand for the Project were estimated using the eQUEST

model to determine the kilowatt-hours required for each condition. The electrical demand was multiplied by the ISO-New England average emission factor to determine CO2 emissions in tons per year for each condition.

5.7.5 GHG Estimates for Direct and Indirect Emissions from Energy Usage

Table 5.7-2 provides the energy demand requirements generated by the eQUEST model for direct and indirect sources for each of the three conditions. The eQUEST energy modeling results for each condition are presented in Appendix E. The electrical energy is assumed to be generated offsite, and is addressed within indirect emissions, below, while natural gas consumption is considered to result in direct emissions from the mechanical equipment. The reductions presented in Table 5.7-2 are based on a comparison of the Enhanced Design and the LEED GHG Mitigation Conditions to the Code Baseline Condition. As discussed earlier, the Proponent continues to evaluate the feasibility of a central heating plant (CHP) to provide more efficient heating, cooling and electrical needs.

Table 5.7-2 GHG Study Energy Requirements for Indirect and Direct Emissions

	Code Baseline Condition	Enhanced Design Condition	LEED GHG Mitigation Condition
Direct Emissions -Gas Consumption (Therms)			
Heating (10^9 Btu/yr)	16.7	11.04	11.27
Lbs of CO_2[1]	449,804	297,355	303,550
Lbs CO_2 Reduction	n/a	-152,449	-146,254
Tons CO_2 Reduction	n/a	-76.2	-73.1
Gas Percentage Reduction	n/a	-34.0	-33.0
Indirect Emissions - Electricity (kW-hrs)			
Lights	2,970,000	2,969,200	2,576,400
Heat Rejection	70,000	14,600	13,900
Primary Cooling	1,490,000	536,300	519,100
Pumps /Auxiliary/ Fans, misc equipment	6,100,000	5,661,000	5,637,700
Primary Heating	30,000		
kWh Total	10,700,000	9,181,500	8,747,100

Table 5.7-2 GHG Study Energy Requirements for Indirect and Direct Emissions (Continued)

	Code Baseline	Enhanced Design	LEED GHG
Indirect Emissions - Electricity (kW-hrs) (cont'd)			
kWh Reduction	n/a	-1,518,500	-1,952,900
Lbs of CO_2[1]	978,735	843,780	803,858
Lbs CO_2 Reduction	n/a	-134,955	-174,877
Tons CO_2 Reduction	n/a	-67.4	-87.4
Kilowatts Percentage Reduction	n/a	-14	-18

Notes:
1. Emissions Factors used to estimate CO2 emission based on the ISO New England Marginal Emissions Report using the average emissions factor in lb/MW-hr.
2. n/a denotes not applicable

5.7.6 Direct GHG Emissions from Stationary Sources

Table 5.7-2 presents the estimated CO2 emissions affiliated with direct emissions from stationary sources. The table shows that direct emissions from the Baseline condition are 449,804 pounds per year of GHG or 225 tpy. The Enhanced Design condition results in 149 tpy of GHG, a reduction of 76 tpy compared to the Baseline condition. The LEED GHG Mitigation condition results in 152 tons per year of GHG which is a reduction of 73 tpy compared to the Baseline. This reduction is attributed to more efficient U-values for the window, wall, and roof, along with greater boiler and chiller efficiency, improved lighting and the installation of exterior window overhangs.

5.7.7 Indirect GHG Emissions from Energy Consumption

In addition to the direct emissions, Table 5.7-2 demonstrates the Enhanced Design condition uses an annual total of 9,181,500 kilowatt hours (kW-hrs) of electricity compared with 10,700,000 kW-hrs for the Baseline condition. The decrease in electrical usage for the Enhanced Design condition is attributed to a more efficient building envelope along with more efficient heating equipment and ventilation fans. In addition, the LEED GHG Mitigation condition uses 8,747,100 kW-hrs of electricity (a reduction due to the use of more efficient building envelope along with improved lighting, installation of window overhangs, and more efficient mechanical equipment, chillers, auxiliary fans, etc.). The LEED GHG Mitigation condition results in a reduction of 87.4 tpy of GHG emissions compared to the Baseline condition, and a reduction of 20 tpy compared to the Enhanced Design condition.

5.7.8 Indirect Emissions from Transportation

Consistent with the GHG Policy, indirect impacts from transportation were derived based on the mesoscale study area (see Section 5.6.7). Similar to the mesoscale study, GHG emissions from mobile sources were estimated for the Existing, No-Build, Build, and Build with Mitigation scenario. Regional emissions were estimated using the intersection criteria chosen for the mesoscale analysis along with the traffic volumes for each condition.

Emission rates of CO2 were estimated for each condition using the MOBILE6.2 emission model. The MOBILE6.2 emission model was run consistent with the microscale and mesoscale analysis discussed in the earlier sections. MOBILE6.2 input parameters are provided in Appendix E.

5.7.8.1 Baseline Conditions

Since there are no buildings currently occupying the site, only the existing traffic conditions for 2008 were estimated for the baseline condition. GHG emissions were estimated for the existing conditions using existing traffic volumes and MOBILE6.2 generated emissions in grams per mile. The existing conditions were compared to the No-Build, Build, and Build with Mitigation conditions.

Table 5.7-3 presents the GHG emissions for the existing conditions. The GHG emissions for the existing conditions are estimated at 96,976 tons per year.

5.7.8.2 Future Conditions

GHG emissions were estimated for the future conditions (2012) using future traffic volumes and MOBILE6.2 generated CO2 emissions. Table 5.7-3 presents the GHG emissions for future No-Build, Build, and Build with mitigation conditions. The future No-build conditions were estimated at 106,523 tpy compared to the Build Condition which were estimated at 109,849 tpy which results in a 3.12 percent increase. For the future Build with Mitigation condition, the GHG emissions were estimated at 106,662 tpy which represents a 3,187 tpy reduction over the Build condition. As discussed in the mesoscale analysis, this reduction is mainly due to the proposed traffic improvements at Audubon Circle, Kenmore Square and Beacon Street at Mountfort Street. The proposed traffic mitigation measures are described in detail in Chapter 4.

Table 5.7-3 GHG Indirect Emissions from Transportation

Pollutant	Time	Units	Existing Condition	Full Build Condition	No-Build Condition	Build - No Build	Percent Difference (Build-No Build)	Build with Mitigation Condition	Build with Mitigation minus the No Build)	Percent Difference (Build with Mitigation minus the No Build)
CO2	Daily	Tons Per Day	265.7	301.0	291.8	9.1113	3.12	292.2	0.4	0.13
	Annual	Tons Per Year	96,976	109,848.6	106,523.0	3,325.6	3.12	106,661.9	138.9	0.13

Notes:

1. Tons per day estimated by assuming hourly peak represents 10 percent of the daily totals.
2. Tons per year estimated by assuming tons per day multiplied by 365 days per year.

5.7.9 Total Project Impacts

The total Project impacts are the sum of the direct emissions from the mechanical equipment along with the indirect emissions affiliated with the energy consumption and traffic generated by the Project. The results of the GHG analysis for the Project are presented in Table 5.7-4.

Table 5.7-4 Results of the GHG Analysis

	Code Baseline Case (TPY)	Enhanced Design Case (TPY)	LEED GHG Mitigation Case (TPY)
Direct Emissions from Stationary Sources	225	149	152
Indirect Emissions from Energy Consumption	489	422	402
Indirect Emissions from Transportation	109,848[1]	109,848[1]	106,662[2]
TOTALS	110,562	110,419	107,216
Reduction below Baseline (tpy)	0	-143	-3,346
Reduction below Baseline	-0-	-0.13%	-3.03%

Notes:
1. Indirect emissions from transportation based on the build condition.
2. Indirect emissions from transportation based on the build with mitigation condition.

5.7.10 Proposed Mitigation Measures

The GHG policy requires proponents to quantify the Projects GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. As discussed in Chapter 6, sustainability elements have been incorporated into the Project to minimize adverse environmental impacts, conserve natural resources, and enhance the quality of life in the community. The Project is striving for a LEED Silver rating. The Project will achieve enough points so as to be LEED certifiable and will comply with Article 37 of the Boston Zoning Code.

The GHG Policy Appendix identifies suggested mitigation measures to reduce GHG emissions and is divided into three categories:

- Siting and Site Design;

- Building Design and Operation; and
- Transportation.

The sustainability elements proposed for the Project incorporate many of the suggested mitigation measures presented in the GHG Policy Appendix. The following is a summary of the mitigation measures. A more detailed discussion of the sustainability design is presented in Section 6.0.

5.7.10.1 Siting and Site Design

The following elements of the Siting and Site Design Mitigation Measures are incorporated into the project:

- The Project is being developed consistent with the Commonwealth of Massachusetts Sustainable Development Principles;
- The Project is located on land which is not protected open space and impact to wetland resources and agricultural land will be minimal;
- The Project will create approximately 1.6 acres of new open green space;
- The Yawkey Commuter Rail Station will be greatly improved and will have better access;
- The orientation of the buildings is approximately east-west which is conducive to passive solar heating;
- Improved pedestrian and cycling corridors with the creation of three new pedestrian corridors connecting Beacon Street to Brookline Avenue, and new bike lanes along Beacon Street. Covered bicycle parking spaces for residential and commercial tenants will be incorporated into the Project; and
- Collection and storage of rainwater. Collected rainwater will be used for groundwater recharge and for irrigation to reduce potable water demand.

5.7.10.2 Building Design and Operation

The following elements of the Building Design and Operation Mitigation Measures are incorporated into the project:

- Green, vegetated roofs for two of the four buildings and white TPO roofing for the remaining two buildings are planned to reduce the urban heat island effect;

- Water efficient strategies will be incorporated such as rainwater harvesting, native vegetation, low flow plumbing fixtures, and the use of water and energy efficient technologies such as Energy Star appliances;

- Building energy options will include the building orientation (*i.e.* east-west) of the Project to incorporate maximum passive solar heating in the winter and year-round optimum daylighting. In addition to building orientation, double glazing windows are being considered along with operable windows, shading, screening, and insulation, high albedo roofing materials, energy efficient mechanical, electrical, architectural, and structural systems. High efficient HVAC systems along with Building Management Systems and lighting systems will be incorporated into all buildings;

- The re-use of building materials and products will be used where feasible along with incorporating raw materials with a minimum recycled content and the use of low emitting materials to improve indoor air quality will be preferred;

- The Project is investigating the feasibility of a vegetative green screen for the south side of the shared use garage. Other options include photovoltaic panels;

- Energy efficient lighting design is planned to maximize the natural light and minimize the watts per square foot. Some of the technologies under consideration are compact fluorescent lighting (CFL), light shelves, photosensitive interior lighting controls, metal halide fixtures, LED and small scale PV for secondary lighting;

- Energy efficient elevators which will reduce energy usage up to 50 percent as compared to conventional elevators are being considered. These elevators will also reduce hazardous waste since it will not require lubricants;

- Recycling will be promoted during construction of the Project along with dedicated space for recycling for future tenants which will include adequate access for waste management vehicles; and

- The Project is investigating the feasibility of a CHP for waste heat recovery along with renewable technologies such geothermal heat/and or solar pumps/photo voltaics.

5.7.10.3 Transportation

The following elements of the Transportation Mitigation Measures are incorporated into the project:

- As discussed fully in Chapter 4, roadway improvements are planned at highly congested intersections such as Audubon Circle, Beacon Street and Kenmore Square;

- The Project will be located adjacent to the Yawkey Way Commuter Rail station and will provide significant enhancements to the station;

- Additional open space will be created along with new walking and bicycle corridors;
- The Project will strictly enforce the Massachusetts Department of Environmental Protection five minute anti idling regulations;
- Designation of an on-site Transportation Coordinator to manage and oversee TDM programs;
- Encourage tenants to provide on-site transit sale passes to employees and residents;
- Encourage commercial tenants to provide transit subsidies;
- Provide bicycle storage facilities for residents and tenants along with secure bicycle racks for the general public near open space areas;
- Provide transit and rideshare information to residents and employees;
- Charge market rates for parking in the shared use garage; and
- Encourage carpool and alternate commuting options.

5.7.11 Conclusion

Consistent with the MEPA GHG Policy, the Proponent has quantitatively addressed GHG emissions affiliated with both direct and indirect emissions from the Project. The Proponent is committed to numerous building design elements and infrastructure improvements that will mitigate "direct" GHG emissions under the LEED GHG Mitigation condition (i.e. the Preferred Alternative). The LEED GHG Mitigation condition results in an overall reduction of 3,343 tpy compared to the Code Baseline condition, while the Enhanced Design condition results in a reduction of 143 tpy. Extensive traffic demand management (TDM) measures will also mitigate "indirect" GHG emissions from the Project. Further investigations will determine whether additional mitigation efforts such as the use of renewable energy sources or CHP are feasible, thereby providing additional reductions in GHG emissions.

The Project is committed to these mitigation measures and believes the design elements proposed under both the Enhanced Design condition and the LEED GHG Mitigation condition reduce GHG emissions, thereby satisfying the MEPA GHG Policy.

5.8 Noise Impacts

5.8.1 Introduction

This section presents a noise analysis for the Project, including a noise-monitoring program to determine existing noise levels and an estimate of future noise levels when the Project is in operation. The analysis indicates that predicted noise levels from Project's mechanical

Appendix E

Air Quality and Greenhouse Gas Emissions

MOBILE6.2 Output

2071 - Parcel 7
Updated: 7/18/08
MOBILE 6.2 Emission Factors

Year: 2008

Pollutant: **VOC**

Speed (mph)	Summer All Veh Em. Factor (g/mi)	Winter All Veh Em. Factor (g/mi)	**Maximum All Veh Em. Factor (g/mi)**
2.5 (idle)	3.415	3.506	**3.506**
25	0.524	0.551	**0.551**
30	0.491	0.516	**0.516**

Pollutant: **NOx**

Speed (mph)	Summer All Veh Em. Factor (g/mi)	Winter All Veh Em. Factor (g/mi)	**Maximum All Veh Em. Factor (g/mi)**
2.5 (idle)	2.256	2.354	**2.354**
25	1.221	1.329	**1.329**
30	1.175	1.284	**1.284**

Pollutant: **CO2**

Speed (mph)	Summer All Veh Em. Factor (g/mi)	Winter All Veh Em. Factor (g/mi)	**Maximum All Veh Em. Factor (g/mi)**
2.5 (idle)	554.5	552.7	**554.5**
25	554.5	552.7	**554.5**
30	554.5	552.7	**554.5**

2071 - Parcel 7
Updated: 7/18/08
MOBILE 6.2 Emission Factors

Year: 2012

Pollutant: **PM2.5**

Speed (mph)	Summer HDDV Em. Factor (g/mi)	Winter HDDV Em. Factor (g/mi)	**Maximum HDDV Em. Factor (g/mi)**
2.5 (idle)	0.107	0.114	**0.114**

Pollutant: **PM10**

Speed (mph)	Summer HDDV Em. Factor (g/mi)	Winter HDDV Em. Factor (g/mi)	**Maximum HDDV Em. Factor (g/mi)**
2.5 (idle)	0.141	0.149	**0.149**

Pollutant: **CO**

Speed (mph)	Summer All Veh Em. Factor (g/mi)	Winter All Veh Em. Factor (g/mi)	**Maximum All Veh Em. Factor (g/mi)**
2.5 (idle)	12.898	20.301	**20.301**

Pollutant: **VOC**

Speed (mph)	Summer All Veh Em. Factor (g/mi)	Winter All Veh Em. Factor (g/mi)	**Maximum All Veh Em. Factor (g/mi)**
2.5 (idle)	2.181	2.221	**2.221**
25	0.356	0.366	**0.366**
30	0.334	0.343	**0.343**

Pollutant: **NOx**

Speed (mph)	Summer All Veh Em. Factor (g/mi)	Winter All Veh Em. Factor (g/mi)	**Maximum All Veh Em. Factor (g/mi)**
2.5 (idle)	1.306	1.370	**1.370**
25	0.703	0.771	**0.771**
30	0.676	0.745	**0.745**

Pollutant: **CO2**

Speed (mph)	Summer All Veh Em. Factor (g/mi)	Winter All Veh Em. Factor (g/mi)	**Maximum All Veh Em. Factor (g/mi)**
2.5 (idle)	561.3	560.0	**561.3**
25	561.3	560.0	**561.3**
30	561.3	560.0	**561.3**

```
*****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                                *
* Input file: MA08_P7.INP (file 1, run 1).                                  *
*****************************************************************************
* *** Summer 2008 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)

* Reading I/M program description records from the following external
* data file: MA_IM08.D
* I/M program inputs for 2008 calendar year model run
* MA31 Exhaust I/M program for Light Duty pre-1996 MY vehicles <=10,0000 lb GVWR

* Reading non-default I/M CUTPOINTS from the following external
* data file: MA08_CUT.D
* Two-Speed Idle Exhaust I/M program for Heavy Duty vehicles >10,000 lb GVWR
* OBD Exhaust I/M program for Light Duty MY 1996+ vehicles
* Gas Cap Evap I/M program thru CY 2003 for all Light Duty pre-1996 MY vehicles <=8,500 lb GVWR
* Gas Cap Evap I/M program for all MY Heavy Duty vehicles >8,500 lb GVWR
* OBD + Gas Cap Evap I/M program for MY 1996 - 2003 Light Duty vehicles <=8,500 lb GVWR
* OBD Evap I/M program for MY 2004+
  M601 Comment:
              User has enabled STAGE II REFUELING.
```

```
* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

  Reading User Supplied Tier2 Exhaust bin phase-in fractions

     Data read from file: LEV2EXH.D


  Reading User Supplied Tier2 EVAP phase-in fractions

     Data read from file: LEV2EVAP.D


  Reading User Supplied Tier2 50K certification standards

     Data read from file: LEV2CERT.D

  M616 Comment:
               User has supplied post-1999 sulfur levels.
  M614 Comment:
               User supplied diesel sale fractions.

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2008 DEFAULT SPEED - Summer

* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #
*** I/M credits for Tech1&2 vehicles were read from the following external
    data file: TECH12.D
  M 48 Warning:
               there are no sales for vehicle class HDGV8b
 HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.

 LEV phase-in data read from file MA_LEV2.D
                     Calendar Year:  2008
                             Month:  July
                          Altitude:  Low
                 Minimum Temperature:  68.0 (F)
                 Maximum Temperature:  94.0 (F)
                   Absolute Humidity:   75. grains/lb
                 Fuel Sulfur Content:   30. ppm

                 Exhaust I/M Program:  Yes
                    Evap I/M Program:  Yes
                         ATP Program:  Yes
                    Reformulated Gas:  Yes
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000
Fuel Economy (mpg):	24.1	18.6	14.3	17.1	9.9	31.9	18.3	7.2	50.0	16.5

Composite Emission Factors (g/mi):

Composite VOC :	0.575	0.435	0.521	0.459	0.601	0.429	0.380	0.436	3.93	0.517
Composite CO :	6.00	5.95	6.91	6.22	7.63	1.520	0.732	2.157	17.09	5.876
Composite NOX :	0.487	0.541	0.835	0.624	2.350	0.930	0.668	8.755	1.27	1.343
Composite CO2 :	368.3	477.6	622.4	518.5	896.5	318.9	555.0	1404.4	177.4	554.53

* #
* 2008 Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)

* File 1, Run 1, Scenario 2.
* #

M583 Warning:
The user supplied arterial average speed of 2.5
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2008
Month:	July
Altitude:	Low
Minimum Temperature:	68.0 (F)
Maximum Temperature:	94.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000
Fuel Economy (mpg):	24.1	18.6	14.3	17.1	9.9	31.9	18.3	7.2	50.0	16.5

Composite Emission Factors (g/mi):

Composite VOC :	4.379	2.926	3.119	2.981	4.347	0.930	0.906	1.349	12.60	3.415
Composite CO :	17.05	14.35	17.22	15.16	35.36	4.301	2.257	9.566	119.90	16.472
Composite NOX :	1.101	1.058	1.606	1.212	1.720	1.492	1.081	13.561	1.12	2.256
Composite CO2 :	368.3	477.5	622.3	518.4	896.4	318.8	555.0	1404.3	177.4	554.48

* #
* 2008 25 mph - Summer

* File 1, Run 1, Scenario 3.
* #

```
 M583 Warning:
          The user supplied arterial average speed of 25.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
                 Calendar Year:  2008
                        Month:  July
                     Altitude:  Low
            Minimum Temperature:  68.0 (F)
            Maximum Temperature:  94.0 (F)
              Absolute Humidity:   75. grains/lb
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  Yes
               Evap I/M Program:  Yes
                    ATP Program:  Yes
               Reformulated Gas:  Yes
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000
Fuel Economy (mpg):	24.1	18.6	14.3	17.1	9.9	31.9	18.3	7.2	50.0	16.5
Composite Emission Factors (g/mi):										
Composite VOC :	0.574	0.432	0.522	0.457	0.644	0.471	0.425	0.514	3.99	0.524
Composite CO :	5.31	5.25	6.16	5.51	7.70	1.581	0.766	2.319	16.90	5.280
Composite NOX :	0.498	0.544	0.842	0.628	2.122	0.811	0.581	7.377	1.12	1.221
Composite CO2 :	368.3	477.5	622.3	518.4	896.4	318.8	555.0	1404.3	177.4	554.48

```
* # # # # # # # # # # # # # # # # # # # # # # #
* 2008 30 mph - Summer

* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 30.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
                 Calendar Year:  2008
                        Month:  July
                     Altitude:  Low
            Minimum Temperature:  68.0 (F)
```

```
          Maximum Temperature:  94.0 (F)
            Absolute Humidity:   75. grains/lb
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  Yes
             Evap I/M Program:  Yes
                  ATP Program:  Yes
            Reformulated Gas:  Yes
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3513	0.3732	0.1467		0.0366	0.0005	0.0014	0.0862	0.0040	1.0000
Fuel Economy (mpg):	24.1	18.6	14.3	17.1	9.9	31.9	18.3	7.2	50.0	16.5
Composite Emission Factors (g/mi):										
Composite VOC :	0.543	0.409	0.496	0.434	0.561	0.431	0.383	0.440	3.78	0.491
Composite CO :	5.28	5.25	6.13	5.50	6.38	1.430	0.683	1.918	14.61	5.171
Composite NOX :	0.471	0.520	0.808	0.602	2.212	0.778	0.557	7.075	1.18	1.175
Composite CO2 :	368.3	477.5	622.3	518.4	896.4	318.8	555.0	1404.3	177.4	554.48

```
************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                           *
* Input file: MA08_P7.INP (file 1, run 2).                             *
************************************************************************
* *** Winter 2008 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
```

```
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)

* Reading I/M program description records from the following external
* data file: MA_IM08.D
* I/M program inputs for 2008 calendar year model run
* MA31 Exhaust I/M program for Light Duty pre-1996 MY vehicles <=10,0000 lb GVWR

* Reading non-default I/M CUTPOINTS from the following external
* data file: MA08_CUT.D
* Two-Speed Idle Exhaust I/M program for Heavy Duty vehicles >10,000 lb GVWR
* OBD Exhaust I/M program for Light Duty MY 1996+ vehicles
* Gas Cap Evap I/M program thru CY 2003 for all Light Duty pre-1996 MY vehicles <=8,500 lb GVWR
* Gas Cap Evap I/M program for all MY Heavy Duty vehicles >8,500 lb GVWR
* OBD + Gas Cap Evap I/M program for MY 1996 - 2003 Light Duty vehicles <=8,500 lb GVWR
* OBD Evap I/M program for MY 2004+
  M601 Comment:
               User has enabled STAGE II REFUELING.


* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

  Reading User Supplied Tier2 Exhaust bin phase-in fractions

     Data read from file: LEV2EXH.D


  Reading User Supplied Tier2 EVAP phase-in fractions

     Data read from file: LEV2EVAP.D


  Reading User Supplied Tier2 50K certification standards

     Data read from file: LEV2CERT.D

  M616 Comment:
               User has supplied post-1999 sulfur levels.
  M614 Comment:
               User supplied diesel sale fractions.

* # # # # # # # # # # # # # # # # # # # # # # # #
* 2008 DEFAULT SPEED - Winter

* File 1, Run 2, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # #
  M112 Warning:
               Wintertime Reformulated Gasoline Rules Apply
*** I/M credits for Tech1&2 vehicles were read from the following external
    data file: TECH12.D
```

```
 M 48 Warning:
             there are no sales for vehicle class HDGV8b
HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2008
                            Month:  Jan.
                         Altitude:  Low
                Minimum Temperature:  35.0 (F)
                Maximum Temperature:  45.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                   Reformulated Gas:  Yes

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                     ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3587    0.3688    0.1448                0.0361    0.0006    0.0014    0.0856    0.0039    1.0000
Fuel Economy (mpg):      24.1      18.6      14.3      17.1       9.9      31.9      18.3       7.2      50.0      16.5
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.573     0.467     0.622     0.511     0.638     0.419     0.395     0.451      3.55     0.544
    Composite CO  :     12.03     12.39     13.34     12.66      9.21     1.488     0.753     2.323     15.79    11.411
    Composite NOX :     0.521     0.633     0.995     0.735     2.738     0.922     0.712     9.293      1.68     1.467
    Composite CO2 :     368.3     477.4     622.2     518.2     896.8     318.9     555.2    1405.8     177.4    552.76
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2008 Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)

* File 1, Run 2, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2008
                            Month:  Jan.
                         Altitude:  Low
                Minimum Temperature:  35.0 (F)
                Maximum Temperature:  45.0 (F)
                  Absolute Humidity:   75. grains/lb
```

Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3587	0.3688	0.1448		0.0361	0.0006	0.0014	0.0856	0.0039	1.0000
Fuel Economy (mpg):	24.1	18.6	14.3	17.1	9.9	31.9	18.3	7.2	50.0	16.5
Composite Emission Factors (g/mi):										
Composite VOC :	4.375	2.989	3.364	3.095	4.946	0.914	0.945	1.397	11.94	3.506
Composite CO :	25.50	25.21	29.53	26.43	42.73	4.241	2.335	10.303	100.99	25.550
Composite NOX :	0.965	1.171	1.830	1.356	2.003	1.480	1.152	14.370	1.48	2.354
Composite CO2 :	368.3	477.4	622.1	518.2	896.8	318.8	555.1	1405.7	177.4	552.71

* #
* 2008 25 mph - Winter

* File 1, Run 2, Scenario 3.
* #

M583 Warning:
The user supplied arterial average speed of 25.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M112 Warning:
Wintertime Reformulated Gasoline Rules Apply

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2008
Month: Jan.
Altitude: Low
Minimum Temperature: 35.0 (F)
Maximum Temperature: 45.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3587	0.3688	0.1448		0.0361	0.0006	0.0014	0.0856	0.0039	1.0000

Fuel Economy (mpg):	24.1	18.6	14.3	17.1	9.9	31.9	18.3	7.2	50.0	16.5

Composite Emission Factors (g/mi):

Composite VOC :	0.569	0.463	0.625	0.508	0.691	0.461	0.442	0.532	3.61	0.551
Composite CO :	11.30	11.65	12.51	11.89	9.30	1.548	0.788	2.498	15.67	10.775
Composite NOX :	0.518	0.630	0.996	0.733	2.472	0.804	0.620	7.824	1.48	1.329
Composite CO2 :	368.3	477.4	622.1	518.2	896.8	318.8	555.1	1405.7	177.4	552.71

* #
* 2008 30 mph - Winter

* File 1, Run 2, Scenario 4.
* #

M583 Warning:
The user supplied arterial average speed of 30.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M112 Warning:
Wintertime Reformulated Gasoline Rules Apply

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D

Calendar Year:	2008
Month:	Jan.
Altitude:	Low
Minimum Temperature:	35.0 (F)
Maximum Temperature:	45.0 (F)
Absolute Humidity:	75. grains/lb
Fuel Sulfur Content:	30. ppm
Exhaust I/M Program:	Yes
Evap I/M Program:	Yes
ATP Program:	Yes
Reformulated Gas:	Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3587	0.3688	0.1448		0.0361	0.0006	0.0014	0.0856	0.0039	1.0000
Fuel Economy (mpg):	24.1	18.6	14.3	17.1	9.9	31.9	18.3	7.2	50.0	16.5

Composite Emission Factors (g/mi):

Composite VOC :	0.539	0.440	0.597	0.484	0.584	0.421	0.398	0.456	3.40	0.516
Composite CO :	11.20	11.55	12.38	11.78	7.71	1.399	0.702	2.066	13.78	10.582
Composite NOX :	0.497	0.606	0.960	0.706	2.576	0.771	0.594	7.505	1.56	1.284
Composite CO2 :	368.3	477.4	622.1	518.2	896.8	318.8	555.1	1405.7	177.4	552.71

```
*********************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                        *
* Input file: MA12_P7.INP (file 1, run 1).                          *
*********************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 2.5 - Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # #

                          Calendar Year:  2012
                                 Month:  July
                Gasoline Fuel Sulfur Content:   30. ppm
                  Diesel Fuel Sulfur Content:   15. ppm
                        Particle Size Cutoff:  2.50 Microns
                            Reformulated Gas:  Yes
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0035	0.0034	0.0034	0.0034	0.0198	------	------	------	0.0142	0.0038
ECARBON:	------	------	------	------	------	0.0688	0.0103	0.0631	------	0.0054
OCARBON:	------	------	------	------	------	0.0194	0.0148	0.0316	------	0.0027
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0040	0.0040	0.0040	0.0040	0.0211	0.0883	0.0253	0.0955	0.0144	0.0126
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0114	0.0114	0.0113	0.0113	0.0286	0.0956	0.0326	0.1071	0.0207	0.0203
SO2:	0.0067	0.0087	0.0115	0.0095	0.0164	0.0029	0.0052	0.0131	0.0033	0.0092
NH3:	0.1011	0.1015	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 2.5 - Summer 25 mph
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # # #

                          Calendar Year:  2012
                                 Month:  July
                Gasoline Fuel Sulfur Content:   30. ppm
                  Diesel Fuel Sulfur Content:   15. ppm
                        Particle Size Cutoff:  2.50 Microns
                            Reformulated Gas:  Yes
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.000	0.0000	------	------	------	0.0000	.0000

GASPM:	0.0036	0.0035	0.0034	0.00	0.0196	------	------	------	0.0142	.0038
ECARBON:	------	------	------	------	------	0.0688	0.0103	0.0631	------	0.0054
OCARBON:	------	------	------	------	------	0.0194	0.0148	0.0316	------	0.0027
SO4:	0.0004	0.0005	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0006
Total Exhaust PM:	0.0040	0.0040	0.0040	0.0040	0.0212	0.0883	0.0253	0.0955	0.0143	0.0126
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0286	0.0956	0.0326	0.1071	0.0207	0.0203
SO2:	0.0067	0.0088	0.0115	0.0095	0.0163	0.0029	0.0052	0.0131	0.0033	0.0092
NH3:	0.1011	0.1015	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

* #
* PM 2.5 - Summer 30 mph
* File 1, Run 1, Scenario 3.
* #

Calendar Year: 2012
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0037	0.0035	0.0035	0.0035	0.0195	------	------	------	0.0142	0.0039
ECARBON:	------	------	------	------	------	0.0688	0.0103	0.0631	------	0.0054
OCARBON:	------	------	------	------	------	0.0194	0.0148	0.0316	------	0.0027
SO4:	0.0003	0.0005	0.0005	0.0005	0.0017	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0040	0.0040	0.0040	0.0040	0.0212	0.0883	0.0253	0.0955	0.0143	0.0125
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0287	0.0956	0.0326	0.1071	0.0206	0.0202
SO2:	0.0067	0.0088	0.0115	0.0096	0.0162	0.0029	0.0052	0.0131	0.0033	0.0092
NH3:	0.1011	0.1015	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

* #
* PM 10 - Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)
* File 1, Run 1, Scenario 4.
* #

Calendar Year: 2012
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0038	0.0037	0.0037	0.0037	0.0220	------	------	------	0.0205	0.0042
ECARBON:	------	------	------	------	------	0.0747	0.0111	0.0685	------	0.0059
OCARBON:	------	------	------	------	------	0.0211	0.0160	0.0343	------	0.0030
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0043	0.0043	0.0043	0.0043	0.0233	0.0960	0.0275	0.1037	0.0207	0.0136
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0248	0.0040	0.0094
Total PM:	0.0249	0.0249	0.0248	0.0249	0.0443	0.1165	0.0480	0.1411	0.0372	0.0356
SO2:	0.0067	0.0087	0.0115	0.0095	0.0164	0.0029	0.0052	0.0131	0.0033	0.0092
NH3:	0.1011	0.1015	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

* #
* PM 10 - Summer 25 mph
* File 1, Run 1, Scenario 5.
* #

Calendar Year: 2012
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0039	0.0038	0.0037	0.0038	0.0218	------	------	------	0.0205	0.0042
ECARBON:	------	------	------	------	------	0.0747	0.0111	0.0685	------	0.0059
OCARBON:	------	------	------	------	------	0.0211	0.0160	0.0343	------	0.0030
SO4:	0.0004	0.0005	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0006
Total Exhaust PM:	0.0043	0.0043	0.0043	0.0043	0.0233	0.0960	0.0275	0.1037	0.0206	0.0136
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0248	0.0040	0.0094
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0444	0.1165	0.0480	0.1411	0.0372	0.0356
SO2:	0.0067	0.0088	0.0115	0.0095	0.0163	0.0029	0.0052	0.0131	0.0033	0.0092
NH3:	0.1011	0.1015	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

* #
* PM 10 - Summer 30 mph
* File 1, Run 1, Scenario 6.
* #

Calendar Year: 2012
Month: July
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0038	0.0038	0.0038	0.0216	------	------	------	0.0205	0.0042
ECARBON:	------	------	------	------	------	0.0747	0.0111	0.0685	------	0.0059
OCARBON:	------	------	------	------	------	0.0211	0.0160	0.0343	------	0.0030
SO4:	0.0003	0.0005	0.0005	0.0005	0.0017	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0043	0.0043	0.0043	0.0043	0.0234	0.0960	0.0275	0.1037	0.0206	0.0136
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0248	0.0040	0.0094
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0444	0.1165	0.0480	0.1411	0.0371	0.0356
SO2:	0.0067	0.0088	0.0115	0.0096	0.0162	0.0029	0.0052	0.0131	0.0033	0.0092
NH3:	0.1011	0.1015	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0925

****
* MOBILE6.2.03 (24-Sep-2003) *
* Input file: MA12_P7.INP (file 1, run 2). *
****

* #
* PM 2.5 - Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)
* File 1, Run 2, Scenario 1.
* #

Calendar Year: 2012
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0035	0.0034	0.0034	0.0034	0.0214	------	------	------	0.0142	0.0039
ECARBON:	------	------	------	------	------	0.0688	0.0109	0.0678	------	0.0058
OCARBON:	------	------	------	------	------	0.0194	0.0157	0.0340	------	0.0029
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0040	0.0040	0.0040	0.0040	0.0226	0.0883	0.0268	0.1027	0.0144	0.0132
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053

Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0114	0.0114	0.0113	0.0114	0.0301	0.0956	0.0341	0.1142	0.0207	0.0209
SO2:	0.0067	0.0088	0.0115	0.0095	0.0164	0.0029	0.0052	0.0131	0.0033	0.0091
NH3:	0.1012	0.1016	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0926

* #
* PM 2.5 - Winter 25 mph
* File 1, Run 2, Scenario 2.
* #

Calendar Year: 2012
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0036	0.0035	0.0035	0.0035	0.0212	------	------	------	0.0142	0.0039
ECARBON:	------	------	------	------	------	0.0688	0.0109	0.0678	------	0.0058
OCARBON:	------	------	------	------	------	0.0194	0.0157	0.0340	------	0.0029
SO4:	0.0004	0.0005	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0006
Total Exhaust PM:	0.0040	0.0040	0.0040	0.0040	0.0227	0.0883	0.0268	0.1027	0.0143	0.0132
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0302	0.0956	0.0341	0.1142	0.0207	0.0209
SO2:	0.0067	0.0088	0.0115	0.0095	0.0163	0.0029	0.0052	0.0131	0.0033	0.0092
NH3:	0.1012	0.1016	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0926

* #
* PM 2.5 - Winter 30 mph
* File 1, Run 2, Scenario 3.
* #

Calendar Year: 2012
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 2.50 Microns
Reformulated Gas: Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000

Composite Emission Factors (g/mi):

Lead:	0.0000	0.0000	0.0000	0.000	0.0000	------	------	------	0.0000	.0000
GASPM:	0.0037	0.0035	0.0035	0.003	0.0210	------	------	------	0.0142	.0039
ECARBON:	------	------	------	------	------	0.0688	0.0109	0.0678	------	0.0058
OCARBON:	------	------	------	------	------	0.0194	0.0157	0.0340	------	0.0029
SO4:	0.0003	0.0005	0.0005	0.0005	0.0017	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0040	0.0040	0.0040	0.0040	0.0228	0.0883	0.0268	0.1027	0.0143	0.0132
Brake:	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053	0.0053
Tire:	0.0020	0.0020	0.0020	0.0020	0.0021	0.0020	0.0020	0.0062	0.0010	0.0024
Total PM:	0.0113	0.0113	0.0113	0.0113	0.0302	0.0956	0.0341	0.1142	0.0206	0.0209
SO2:	0.0067	0.0088	0.0115	0.0096	0.0162	0.0029	0.0052	0.0131	0.0033	0.0092
NH3:	0.1012	0.1016	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0926

* #
* PM 10 - Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)
* File 1, Run 2, Scenario 4.
* #

Calendar Year: 2012
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0038	0.0037	0.0037	0.0037	0.0237	------	------	------	0.0205	0.0042
ECARBON:	------	------	------	------	------	0.0747	0.0118	0.0737	------	0.0063
OCARBON:	------	------	------	------	------	0.0211	0.0170	0.0369	------	0.0032
SO4:	0.0005	0.0006	0.0006	0.0006	0.0013	0.0002	0.0003	0.0009	0.0002	0.0006
Total Exhaust PM:	0.0043	0.0043	0.0043	0.0043	0.0250	0.0960	0.0291	0.1115	0.0207	0.0143
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0248	0.0040	0.0094
Total PM:	0.0249	0.0249	0.0249	0.0249	0.0460	0.1165	0.0497	0.1489	0.0372	0.0363
SO2:	0.0067	0.0088	0.0115	0.0095	0.0164	0.0029	0.0052	0.0131	0.0033	0.0091
NH3:	0.1012	0.1016	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0926

* #
* PM 10 - Winter 25 mph
* File 1, Run 2, Scenario 5.
* #

Calendar Year: 2012
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0039	0.0038	0.0038	0.0038	0.0235	------	------	------	0.0205	0.0043
ECARBON:	------	------	------	------	------	0.0747	0.0118	0.0737	------	0.0063
OCARBON:	------	------	------	------	------	0.0211	0.0170	0.0369	------	0.0032
SO4:	0.0004	0.0005	0.0005	0.0005	0.0015	0.0002	0.0003	0.0009	0.0001	0.0006
Total Exhaust PM:	0.0043	0.0043	0.0043	0.0043	0.0250	0.0960	0.0291	0.1115	0.0206	0.0143
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0248	0.0040	0.0094
Total PM:	0.0248	0.0249	0.0248	0.0248	0.0461	0.1165	0.0497	0.1489	0.0372	0.0363
SO2:	0.0067	0.0088	0.0115	0.0095	0.0163	0.0029	0.0052	0.0131	0.0033	0.0092
NH3:	0.1012	0.1016	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0926

* #
* PM 10 - Winter 30 mph
* File 1, Run 2, Scenario 6.
* #

Calendar Year: 2012
Month: Jan.
Gasoline Fuel Sulfur Content: 30. ppm
Diesel Fuel Sulfur Content: 15. ppm
Particle Size Cutoff: 10.00 Microns
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000
Composite Emission Factors (g/mi):										
Lead:	0.0000	0.0000	0.0000	0.0000	0.0000	------	------	------	0.0000	0.0000
GASPM:	0.0040	0.0038	0.0038	0.0038	0.0233	------	------	------	0.0205	0.0043
ECARBON:	------	------	------	------	------	0.0747	0.0118	0.0737	------	0.0063
OCARBON:	------	------	------	------	------	0.0211	0.0170	0.0369	------	0.0032
SO4:	0.0003	0.0005	0.0005	0.0005	0.0017	0.0002	0.0003	0.0009	0.0001	0.0005
Total Exhaust PM:	0.0043	0.0043	0.0043	0.0043	0.0251	0.0960	0.0291	0.1115	0.0206	0.0143
Brake:	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125	0.0125
Tire:	0.0080	0.0080	0.0080	0.0080	0.0085	0.0080	0.0080	0.0248	0.0040	0.0094
Total PM:	0.0248	0.0248	0.0248	0.0248	0.0462	0.1165	0.0497	0.1489	0.0371	0.0363
SO2:	0.0067	0.0088	0.0115	0.0096	0.0162	0.0029	0.0052	0.0131	0.0033	0.0092
NH3:	0.1012	0.1016	0.1017	0.1016	0.0451	0.0068	0.0068	0.0270	0.0113	0.0926

```
*******************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                                  *
* Input file: MA12_P7.INP (file 1, run 1).                                    *
*******************************************************************************
* *** Summer 2012 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00      MYR sum not = 1. (will normalize)

* Reading I/M program description records from the following external
* data file: MA12_IM.D
* I/M program inputs for 2012 calendar year model run
* MA31 Exhaust I/M program for Light Duty pre-1996 MY vehicles <=10,0000 lb GVWR

* Reading non-default I/M CUTPOINTS from the following external
* data file: MA12_CUT.D
* Two-Speed Idle Exhaust I/M program for Heavy Duty vehicles >10,000 lb GVWR
* OBD Exhaust I/M program for Light Duty MY 1996+ vehicles <=10,000 lb GVWR
* Gas Cap Evap I/M program thru CY 2003 for all Light Duty vehicles <=8,500 lb GVWR
* Gas Cap Evap I/M program for all MY Heavy Duty vehicles >8,500 lb GVWR
* OBD + Gas Cap Evap I/M program for MY 1996 - 2003 Light Duty vehicles <=8,500 lb GVWR starting 2004
* OBD Evap I/M program for MY 2004+
  M601 Comment:
               User has enabled STAGE II REFUELING.
```

```
* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

  Reading User Supplied Tier2 Exhaust bin phase-in fractions

     Data read from file: LEV2EXH.D


  Reading User Supplied Tier2 EVAP phase-in fractions

     Data read from file: LEV2EVAP.D


  Reading User Supplied Tier2 50K certification standards

     Data read from file: LEV2CERT.D

  M616 Comment:
               User has supplied post-1999 sulfur levels.
  M614 Comment:
               User supplied diesel sale fractions.

* # # # # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 2.5 - Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)

* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
             The user supplied arterial average speed of  2.5
             will be used for all hours of the day.  100% of VMT
             has been assigned to the arterial/collector roadway
             type for all hours of the day and all vehicle types.
*** I/M credits for Tech1&2 vehicles were read from the following external
    data file: TECH12.D
```

M 48 Warning:
there are no sales for vehicle class HDGV8b
HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.

* Reading Ammonia (NH3) Basic Emissiion Rates
* from the external data file PMNH3BER.D

* Reading Ammonia (NH3) Sulfur Deterioration Rates
* from the external data file PMNH3SDR.D

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2012
Month: July
Altitude: Low
Minimum Temperature: 68.0 (F)
Maximum Temperature: 94.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	2.623	1.936	2.185	2.006	2.950	0.404	0.458	1.013	12.04	2.181
Composite CO :	13.47	11.62	12.73	11.93	29.77	4.047	1.460	5.452	119.90	12.898
Composite NOX :	0.696	0.607	0.887	0.686	0.839	0.667	0.439	7.794	1.12	1.306
Composite CO2 :	368.0	478.9	623.9	519.9	895.3	314.0	553.9	1400.7	177.4	561.30

* #
* PM 2.5 - Summer 25 mph

* File 1, Run 1, Scenario 2.
* #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels

```
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 25.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2012
                            Month:  July
                         Altitude:  Low
               Minimum Temperature:  68.0 (F)
               Maximum Temperature:  94.0 (F)
                 Absolute Humidity:   75. grains/lb
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  Yes
                  Evap I/M Program:  Yes
                       ATP Program:  Yes
                  Reformulated Gas:  Yes
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	0.368	0.299	0.364	0.317	0.437	0.191	0.214	0.386	3.81	0.356
Composite CO :	4.21	4.16	4.55	4.27	6.48	1.414	0.480	1.322	16.90	4.121
Composite NOX :	0.308	0.314	0.466	0.357	1.036	0.359	0.237	4.242	1.12	0.703
Composite CO2 :	368.0	478.9	623.9	519.9	895.3	314.0	553.9	1400.7	177.4	561.30

```
* # # # # # # # # # # # # # # # # # # # # # # #
* PM 2.5 - Summer 30 mph

* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV
```

```
* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 30.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                      Calendar Year:  2012
                              Month:  July
                           Altitude:  Low
                Minimum Temperature:  68.0 (F)
                Maximum Temperature:  94.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                   Reformulated Gas:  Yes
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	0.349	0.283	0.346	0.301	0.387	0.173	0.192	0.331	3.60	0.334
Composite CO :	4.16	4.12	4.51	4.23	5.38	1.268	0.426	1.093	14.61	4.017
Composite NOX :	0.291	0.300	0.448	0.342	1.079	0.344	0.227	4.069	1.18	0.676
Composite CO2 :	368.0	478.9	623.9	519.9	895.3	314.0	553.9	1400.7	177.4	561.30

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 10 - Idle Scenario - Summer (multiply g/mi by 2.5 mph to get g/hr)

* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                     Calendar Year:  2012
                             Month:  July
                          Altitude:  Low
                Minimum Temperature:  68.0 (F)
                Maximum Temperature:  94.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                  Reformulated Gas:  Yes
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	2.623	1.936	2.185	2.006	2.950	0.404	0.458	1.013	12.04	2.181
Composite CO :	13.47	11.62	12.73	11.93	29.77	4.047	1.460	5.452	119.90	12.898
Composite NOX :	0.696	0.607	0.887	0.686	0.839	0.667	0.439	7.794	1.12	1.306
Composite CO2 :	368.0	478.9	623.9	519.9	895.3	314.0	553.9	1400.7	177.4	561.30

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
* PM 10 - Summer 25 mph

* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 25.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                     Calendar Year:  2012
                             Month:  July
                          Altitude:  Low
                Minimum Temperature:  68.0 (F)
                Maximum Temperature:  94.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                   Reformulated Gas:  Yes
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	0.368	0.299	0.364	0.317	0.437	0.191	0.214	0.386	3.81	0.356
Composite CO :	4.21	4.16	4.55	4.27	6.48	1.414	0.480	1.322	16.90	4.121

Composite NOX :	0.308	0.314	0.466	0.357	1.036	0.359	0.237	4.242	1.12	0.703
Composite CO2 :	368.0	478.9	623.9	519.9	895.3	314.0	553.9	1400.7	177.4	561.30

* #
* PM 10 - Summer 30 mph

* File 1, Run 1, Scenario 6.
* #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV

M583 Warning:
The user supplied arterial average speed of 30.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2012
Month: July
Altitude: Low
Minimum Temperature: 68.0 (F)
Maximum Temperature: 94.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3071	0.4054	0.1595		0.0369	0.0002	0.0015	0.0857	0.0038	1.0000

Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	0.349	0.283	0.346	0.301	0.387	0.173	0.192	0.331	3.60	0.334
Composite CO :	4.16	4.12	4.51	4.23	5.38	1.268	0.426	1.093	14.61	4.017
Composite NOX :	0.291	0.300	0.448	0.342	1.079	0.344	0.227	4.069	1.18	0.676
Composite CO2 :	368.0	478.9	623.9	519.9	895.3	314.0	553.9	1400.7	177.4	561.30

```
************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                           *
* Input file: MA12_P7.INP (file 1, run 2).                             *
************************************************************************
* *** Winter 2012 ***

* Reading Registration Distributions from the following external
* data file: 2005_REG.D
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.998     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
               0.999     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)
  M 49 Warning:
                1.00     MYR sum not = 1. (will normalize)

* Reading I/M program description records from the following external
* data file: MA12_IM.D
* I/M program inputs for 2012 calendar year model run
* MA31 Exhaust I/M program for Light Duty pre-1996 MY vehicles <=10,0000 lb GVWR

* Reading non-default I/M CUTPOINTS from the following external
* data file: MA12_CUT.D
* Two-Speed Idle Exhaust I/M program for Heavy Duty vehicles >10,000 lb GVWR
```

```
* OBD Exhaust I/M program for Light Duty MY 1996+ vehicles <=10,000 lb GVWR
* Gas Cap Evap I/M program thru CY 2003 for all Light Duty vehicles <=8,500 lb GVWR
* Gas Cap Evap I/M program for all MY Heavy Duty vehicles >8,500 lb GVWR
* OBD + Gas Cap Evap I/M program for MY 1996 - 2003 Light Duty vehicles <=8,500 lb GVWR starting 2004
* OBD Evap I/M program for MY 2004+
  M601 Comment:
               User has enabled STAGE II REFUELING.


* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

  Reading User Supplied Tier2 Exhaust bin phase-in fractions

     Data read from file: LEV2EXH.D


  Reading User Supplied Tier2 EVAP phase-in fractions

     Data read from file: LEV2EVAP.D


  Reading User Supplied Tier2 50K certification standards

     Data read from file: LEV2CERT.D

  M616 Comment:
               User has supplied post-1999 sulfur levels.
  M614 Comment:
               User supplied diesel sale fractions.

* # # # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 2.5 - Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)

* File 1, Run 2, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
```

```
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
*** I/M credits for Tech1&2 vehicles were read from the following external
    data file: TECH12.D
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
 HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2012
                            Month:  Jan.
                         Altitude:  Low
                Minimum Temperature:  35.0 (F)
                Maximum Temperature:  45.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                   Reformulated Gas:  Yes
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	2.646	1.938	2.287	2.036	3.322	0.395	0.476	1.037	11.37	2.221
Composite CO :	21.34	19.91	21.56	20.37	36.58	3.991	1.489	5.849	100.99	20.301
Composite NOX :	0.591	0.659	1.000	0.755	0.976	0.660	0.469	8.448	1.48	1.370
Composite CO2 :	368.0	478.9	623.9	519.8	895.5	314.0	554.0	1401.9	177.4	559.95

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 2.5 - Winter 25 mph

* File 1, Run 2, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV
```

```
* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
          The user supplied arterial average speed of 25.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M112 Warning:
             Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                  Calendar Year:  2012
                          Month:  Jan.
                       Altitude:  Low
            Minimum Temperature:  35.0 (F)
            Maximum Temperature:  45.0 (F)
              Absolute Humidity:   75. grains/lb
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  Yes
               Evap I/M Program:  Yes
                    ATP Program:  Yes
               Reformulated Gas:  Yes
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	0.361	0.309	0.414	0.338	0.453	0.187	0.222	0.395	3.42	0.366
Composite CO :	9.96	9.38	9.57	9.43	7.97	1.385	0.489	1.418	15.67	8.871
Composite NOX :	0.315	0.358	0.549	0.412	1.204	0.356	0.252	4.599	1.48	0.771
Composite CO2 :	368.0	478.9	623.9	519.8	895.5	314.0	554.0	1401.9	177.4	559.95

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 2.5 - Winter 30 mph

* File 1, Run 2, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 30.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2012
                            Month:  Jan.
                         Altitude:  Low
               Minimum Temperature:  35.0 (F)
               Maximum Temperature:  45.0 (F)
                 Absolute Humidity:   75. grains/lb
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  Yes
                  Evap I/M Program:  Yes
                       ATP Program:  Yes
                  Reformulated Gas:  Yes
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	0.342	0.294	0.395	0.323	0.389	0.168	0.199	0.338	3.22	0.343
Composite CO :	9.89	9.31	9.48	9.36	6.60	1.241	0.434	1.173	13.78	8.727
Composite NOX :	0.303	0.344	0.530	0.397	1.255	0.341	0.242	4.412	1.56	0.745
Composite CO2 :	368.0	478.9	623.9	519.8	895.5	314.0	554.0	1401.9	177.4	559.95

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* PM 10  - Idle Scenario - Winter (multiply g/mi by 2.5 mph to get g/hr)

* File 1, Run 2, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2012
                            Month:  Jan.
                         Altitude:  Low
                Minimum Temperature:  35.0 (F)
                Maximum Temperature:  45.0 (F)
                  Absolute Humidity:   75. grains/lb
                Fuel Sulfur Content:   30. ppm

                Exhaust I/M Program:  Yes
                   Evap I/M Program:  Yes
                        ATP Program:  Yes
                   Reformulated Gas:  Yes
```

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000

Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	2.646	1.938	2.287	2.036	3.322	0.395	0.476	1.037	11.37	2.221
Composite CO :	21.34	19.91	21.56	20.37	36.58	3.991	1.489	5.849	100.99	20.301
Composite NOX :	0.591	0.659	1.000	0.755	0.976	0.660	0.469	8.448	1.48	1.370
Composite CO2 :	368.0	478.9	623.9	519.8	895.5	314.0	554.0	1401.9	177.4	559.95

```
* # # # # # # # # # # # # # # # # # # # # # # #
* PM 10  - Winter 25 mph

* File 1, Run 2, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 25.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2012
                            Month:  Jan.
                         Altitude:  Low
               Minimum Temperature:  35.0 (F)
               Maximum Temperature:  45.0 (F)
                 Absolute Humidity:   75. grains/lb
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  Yes
                  Evap I/M Program:  Yes
```

ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type: / GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	0.361	0.309	0.414	0.338	0.453	0.187	0.222	0.395	3.42	0.366
Composite CO :	9.96	9.38	9.57	9.43	7.97	1.385	0.489	1.418	15.67	8.871
Composite NOX :	0.315	0.358	0.549	0.412	1.204	0.356	0.252	4.599	1.48	0.771
Composite CO2 :	368.0	478.9	623.9	519.8	895.5	314.0	554.0	1401.9	177.4	559.95

```
* # # # # # # # # # # # # # # # # # # # # # # # #
* PM 10  - Winter 30 mph

* File 1, Run 2, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # #

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M583 Warning:
            The user supplied arterial average speed of 30.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M112 Warning:
              Wintertime Reformulated Gasoline Rules Apply
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

 LEV phase-in data read from file MA_LEV2.D
                    Calendar Year:  2012
                           Month:  Jan.
                        Altitude:  Low
```

Minimum Temperature: 35.0 (F)
Maximum Temperature: 45.0 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: Yes
Evap I/M Program: Yes
ATP Program: Yes
Reformulated Gas: Yes

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3121	0.4027	0.1582		0.0364	0.0002	0.0015	0.0852	0.0038	1.0000
Fuel Economy (mpg):	24.1	18.5	14.2	17.1	9.9	32.4	18.4	7.3	50.0	16.3
Composite Emission Factors (g/mi):										
Composite VOC :	0.342	0.294	0.395	0.323	0.389	0.168	0.199	0.338	3.22	0.343
Composite CO :	9.89	9.31	9.48	9.36	6.60	1.241	0.434	1.173	13.78	8.727
Composite NOX :	0.303	0.344	0.530	0.397	1.255	0.341	0.242	4.412	1.56	0.745
Composite CO2 :	368.0	478.9	623.9	519.8	895.5	314.0	554.0	1401.9	177.4	559.95

SCREEN3 Output

Parcel 7
Mechanical Equipment SCREEN3 Modeling Results

	Short Term Emissions per unit (g/s)						SCREEN3 X/Q Concentrations (ug/m3)
	NOx	CO	VOC	PM	SO2		
Egen#1	0.5085	0.441	0.170	0.025	0.008		895.8
Egen#1	0.3955	0.343	0.132	0.020	0.006		651.4
Egen#1	0.5085	0.441	0.170	0.025	0.008		436.1
Egen#4	0.1695	0.147	0.057	0.008	0.003		496.8
Boiler 1	0.0169785	0.039	0.015	0.005	0.005		1994
Boiler 2	0.02205	0.050	0.019	0.006	0.006		651.4
Boiler 3	0.028665	0.066	0.025	0.008	0.008		436.1
Boiler 4	0.011907	0.027	0.010	0.003	0.003		496.8

Pollutant	Period	Concentration (ug/m3)	Loading Docks (ug/m3)	Monitored Background Value (ug/m3)	Total Concentration (ug/m3)	NAAQS (ug/m3)
NO2	Annual	10.15		43	53.15	100
SO2	3-Hour	31.63		222	253.63	1300
	24-Hour	14.06		105	119.06	365
	Annual	1.96		16	17.96	80
PM10	24-hour	28.00	0.70	58	86.70	150
	Annual	7.00	0.17	29	36.17	50
CO	1-Hour	1035.53		3888	4923.53	40000
	8-Hour	724.87		2592	3316.87	10000

Notes:

1. Background concentrations are the highest second highest values in Boston for 2005-2007
2. Emergency Generators limited to 300 hours per year.

07/15/08
13:15:18

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

SCREEN3 Modeling File for Parcel 7 Boiler 1

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	27.0000
STK INSIDE DIAM (M)	=	.2100
STK EXIT VELOCITY (M/S)	=	9.1000
STK GAS EXIT TEMP (K)	=	293.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	URBAN
BUILDING HEIGHT (M)	=	24.4000
MIN HORIZ BLDG DIM (M)	=	13.7000
MAX HORIZ BLDG DIM (M)	=	30.5000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = .913 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	0	.0	.0	.0	.00	.00	.00	NA
75.	370.0	5	1.0	1.3	10000.0	27.02	8.13	14.78	SS
100.	337.3	5	1.0	1.3	10000.0	27.02	10.79	16.22	SS
150.	283.8	5	1.0	1.3	10000.0	27.02	16.03	19.10	SS
200.	238.5	5	1.0	1.3	10000.0	27.02	21.17	21.98	SS
300.	169.9	5	1.0	1.3	10000.0	27.02	31.18	27.99	SS
400.	125.7	5	1.0	1.3	10000.0	27.02	40.85	32.73	SS
500.	97.24	5	1.0	1.3	10000.0	27.02	50.21	37.15	SS
600.	77.93	5	1.0	1.3	10000.0	27.02	59.27	41.30	SS
700.	64.23	5	1.0	1.3	10000.0	27.02	68.06	45.21	SS
800.	54.13	5	1.0	1.3	10000.0	27.02	76.59	48.93	SS
900.	46.46	5	1.0	1.3	10000.0	27.02	84.89	52.47	SS
1000.	40.48	5	1.0	1.3	10000.0	27.02	92.97	55.85	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	895.8	CONC (UG/M**3)	=	1994.
CRIT WS @10M (M/S)	=	1.00	CRIT WS @10M (M/S)	=	1.00
CRIT WS @ HS (M/S)	=	1.22	CRIT WS @ HS (M/S)	=	1.22
DILUTION WS (M/S)	=	1.00	DILUTION WS (M/S)	=	1.00
CAVITY HT (M)	=	43.22	CAVITY HT (M)	=	32.09

```
 CAVITY LENGTH (M)  =    59.46        CAVITY LENGTH (M)  =    18.29
 ALONGWIND DIM (M)  =    13.70        ALONGWIND DIM (M)  =    30.50

**************************************
     END OF CAVITY CALCULATIONS
**************************************


     **************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     **************************************

 CALCULATION         MAX CONC     DIST TO    TERRAIN
  PROCEDURE         (UG/M**3)     MAX (M)     HT (M)
--------------     -----------    -------    -------
SIMPLE TERRAIN       370.0           75.         0.

BLDG. CAVITY-1       895.8           59.        --   (DIST = CAVITY LENGTH)

BLDG. CAVITY-2       1994.           18.        --   (DIST = CAVITY LENGTH)


**************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
**************************************************
```

07/15/08
13:40:03

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

SCREEN3 Modeling File for Parcel 7 Egen 1

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	27.0000
STK INSIDE DIAM (M)	=	.2040
STK EXIT VELOCITY (M/S)	=	57.5000
STK GAS EXIT TEMP (K)	=	765.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	URBAN
BUILDING HEIGHT (M)	=	24.4000
MIN HORIZ BLDG DIM (M)	=	13.7000
MAX HORIZ BLDG DIM (M)	=	30.5000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 3.619 M**4/S**3; MOM. FLUX = 13.175 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	0	.0	.0	.0	.00	.00	.00	NA
75.	116.4	1	1.5	1.7	480.0	29.73	23.65	18.66	SS
100.	105.0	1	1.5	1.7	480.0	31.65	31.38	25.17	SS
150.	95.82	3	1.5	1.8	480.0	33.82	32.05	30.00	SS
200.	84.18	4	1.5	1.9	480.0	35.54	30.79	27.20	SS
300.	63.96	4	1.0	1.3	320.0	49.44	45.36	40.23	SS
400.	61.30	6	1.0	1.3	10000.0	41.05	40.85	25.30	SS
500.	61.94	6	1.0	1.3	10000.0	41.05	50.21	30.24	SS
600.	57.15	6	1.0	1.3	10000.0	41.05	59.27	34.82	SS
700.	51.18	6	1.0	1.3	10000.0	41.05	68.06	39.11	SS
800.	45.47	6	1.0	1.3	10000.0	41.05	76.59	43.15	SS
900.	40.45	6	1.0	1.3	10000.0	41.05	84.89	46.97	SS
1000.	36.15	6	1.0	1.3	10000.0	41.05	92.97	50.60	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	895.8	CONC (UG/M**3)	=	787.2
CRIT WS @10M (M/S)	=	1.27	CRIT WS @10M (M/S)	=	4.15
CRIT WS @ HS (M/S)	=	1.55	CRIT WS @ HS (M/S)	=	5.07
DILUTION WS (M/S)	=	1.00	DILUTION WS (M/S)	=	2.53
CAVITY HT (M)	=	43.22	CAVITY HT (M)	=	32.09

CAVITY LENGTH (M)	=	59.46	CAVITY LENGTH (M)	=	18.29
ALONGWIND DIM (M)	=	13.70	ALONGWIND DIM (M)	=	30.50

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)	
SIMPLE TERRAIN	116.4	75.	0.	
BLDG. CAVITY-1	895.8	59.	--	(DIST = CAVITY LENGTH)
BLDG. CAVITY-2	787.2	18.	--	(DIST = CAVITY LENGTH)

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

07/15/08
13:41:55

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

SCREEN3 Modeling File for Parcel 7 Boiler 2

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	48.0000
STK INSIDE DIAM (M)	=	.2400
STK EXIT VELOCITY (M/S)	=	10.1000
STK GAS EXIT TEMP (K)	=	293.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	URBAN
BUILDING HEIGHT (M)	=	44.5000
MIN HORIZ BLDG DIM (M)	=	23.0000
MAX HORIZ BLDG DIM (M)	=	45.7000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = 1.469 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	0	.0	.0	.0	.00	.00	.00	NA
75.	.0000	0	.0	.0	.0	.00	.00	.00	NA
100.	.0000	0	.0	.0	.0	.00	.00	.00	NA
150.	93.47	5	1.0	1.6	10000.0	48.01	19.01	29.34	SS
200.	91.52	5	1.0	1.6	10000.0	48.01	22.36	32.39	SS
300.	76.10	5	1.0	1.6	10000.0	48.01	31.18	38.48	SS
400.	61.14	5	1.0	1.6	10000.0	48.01	40.85	44.58	SS
500.	49.90	5	1.0	1.6	10000.0	48.01	50.21	50.55	SS
600.	41.84	5	1.0	1.6	10000.0	48.01	59.27	54.01	SS
700.	35.89	5	1.0	1.6	10000.0	48.01	68.06	57.33	SS
800.	31.32	5	1.0	1.6	10000.0	48.01	76.59	60.51	SS
900.	27.70	5	1.0	1.6	10000.0	48.01	84.89	63.57	SS
1000.	24.78	5	1.0	1.6	10000.0	48.01	92.97	66.53	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	327.8	CONC (UG/M**3)	=	651.4
CRIT WS @10M (M/S)	=	1.00	CRIT WS @10M (M/S)	=	1.00
CRIT WS @ HS (M/S)	=	1.37	CRIT WS @ HS (M/S)	=	1.37
DILUTION WS (M/S)	=	1.00	DILUTION WS (M/S)	=	1.00
CAVITY HT (M)	=	80.86	CAVITY HT (M)	=	63.24

CAVITY LENGTH (M)	=	96.50	CAVITY LENGTH (M)	=	35.55
ALONGWIND DIM (M)	=	23.00	ALONGWIND DIM (M)	=	45.70

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)	
SIMPLE TERRAIN	93.47	150.	0.	
BLDG. CAVITY-1	327.8	96.	--	(DIST = CAVITY LENGTH)
BLDG. CAVITY-2	651.4	36.	--	(DIST = CAVITY LENGTH)

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

07/15/08
13:56:02

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

SCREEN3 Modeling File for Parcel 7 Egen 2

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	48.0000
STK INSIDE DIAM (M)	=	.1500
STK EXIT VELOCITY (M/S)	=	86.2000
STK GAS EXIT TEMP (K)	=	766.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	URBAN
BUILDING HEIGHT (M)	=	44.5000
MIN HORIZ BLDG DIM (M)	=	23.0000
MAX HORIZ BLDG DIM (M)	=	45.7000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 2.936 M**4/S**3; MOM. FLUX = 15.987 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	0	.0	.0	.0	.00	.00	.00	NA
75.	.0000	0	.0	.0	.0	.00	.00	.00	NA
100.	.0000	0	.0	.0	.0	.00	.00	.00	NA
150.	58.85	1	1.0	1.3	320.0	50.78	46.62	38.61	SS
200.	59.94	3	1.0	1.4	320.0	51.51	42.34	40.00	SS
300.	55.30	6	1.0	1.6	10000.0	50.76	31.18	31.52	SS
400.	50.70	6	1.0	1.6	10000.0	50.76	40.85	36.51	SS
500.	45.42	6	1.0	1.6	10000.0	50.76	50.21	42.01	SS
600.	39.65	6	1.0	1.6	10000.0	50.76	59.27	45.89	SS
700.	34.88	6	1.0	1.6	10000.0	50.76	68.06	49.57	SS
800.	30.96	6	1.0	1.6	10000.0	50.76	76.59	53.08	SS
900.	27.69	6	1.0	1.6	10000.0	50.76	84.89	56.43	SS
1000.	24.96	6	1.0	1.6	10000.0	50.76	92.97	59.65	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	327.8	CONC (UG/M**3)	=	651.4
CRIT WS @10M (M/S)	=	1.00	CRIT WS @10M (M/S)	=	1.35
CRIT WS @ HS (M/S)	=	1.37	CRIT WS @ HS (M/S)	=	1.85
DILUTION WS (M/S)	=	1.00	DILUTION WS (M/S)	=	1.00
CAVITY HT (M)	=	80.86	CAVITY HT (M)	=	63.24

CAVITY LENGTH (M)	=	96.50	CAVITY LENGTH (M)	=	35.55
ALONGWIND DIM (M)	=	23.00	ALONGWIND DIM (M)	=	45.70

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)	
SIMPLE TERRAIN	59.94	200.	0.	
BLDG. CAVITY-1	327.8	96.	--	(DIST = CAVITY LENGTH)
BLDG. CAVITY-2	651.4	36.	--	(DIST = CAVITY LENGTH)

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

07/15/08
13:59:46

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

SCREEN3 Modeling File for Parcel 7 Boiler 3

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	94.0000
STK INSIDE DIAM (M)	=	.2700
STK EXIT VELOCITY (M/S)	=	10.7000
STK GAS EXIT TEMP (K)	=	293.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	URBAN
BUILDING HEIGHT (M)	=	91.0000
MIN HORIZ BLDG DIM (M)	=	16.8000
MAX HORIZ BLDG DIM (M)	=	30.5000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = 2.087 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	0	.0	.0	.0	.00	.00	.00	NA
75.	.0000	0	.0	.0	.0	.00	.00	.00	NA
100.	.0000	0	.0	.0	.0	.00	.00	.00	NA
150.	6.514	1	1.0	1.4	320.0	94.02	46.62	38.61	SS
200.	14.20	1	1.0	1.4	320.0	94.02	61.58	52.58	SS
300.	15.92	3	1.0	1.6	320.0	94.02	62.36	60.00	SS
400.	15.59	3	1.0	1.6	320.0	94.02	81.71	80.00	SS
500.	13.52	4	1.0	1.8	320.0	94.02	73.03	65.28	SS
600.	13.02	4	1.0	1.8	320.0	94.02	86.21	77.33	SS
700.	11.81	4	1.0	1.8	320.0	94.02	98.99	89.09	SS
800.	10.48	4	1.0	1.8	320.0	94.02	111.41	100.58	SS
900.	9.246	4	1.0	1.8	320.0	94.02	123.48	111.81	SS
1000.	8.709	5	1.0	2.0	10000.0	94.01	92.97	60.85	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	240.2	CONC (UG/M**3)	=	436.1
CRIT WS @10M (M/S)	=	1.00	CRIT WS @10M (M/S)	=	1.00
CRIT WS @ HS (M/S)	=	1.57	CRIT WS @ HS (M/S)	=	1.57
DILUTION WS (M/S)	=	1.00	DILUTION WS (M/S)	=	1.00
CAVITY HT (M)	=	205.53	CAVITY HT (M)	=	185.17

```
  CAVITY LENGTH (M)  =   121.49        CAVITY LENGTH (M)  =    53.05
  ALONGWIND DIM (M)  =    16.80        ALONGWIND DIM (M)  =    30.50

*****************************************
     END OF CAVITY CALCULATIONS
*****************************************


     ****************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     ****************************************

 CALCULATION         MAX CONC     DIST TO    TERRAIN
  PROCEDURE         (UG/M**3)     MAX (M)     HT (M)
--------------     -----------   -------    -------
SIMPLE TERRAIN       15.92          300.         0.

BLDG. CAVITY-1       240.2          121.        --   (DIST = CAVITY LENGTH)

BLDG. CAVITY-2       436.1           53.        --   (DIST = CAVITY LENGTH)


**************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
**************************************************
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07/15/08
14:01:17

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

SCREEN3 Modeling File for Parcel 7 Egen 3

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	94.0000
STK INSIDE DIAM (M)	=	.2000
STK EXIT VELOCITY (M/S)	=	57.5000
STK GAS EXIT TEMP (K)	=	917.6000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	URBAN
BUILDING HEIGHT (M)	=	91.0000
MIN HORIZ BLDG DIM (M)	=	16.8000
MAX HORIZ BLDG DIM (M)	=	30.5000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 3.838 M**4/S**3; MOM. FLUX = 10.557 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	0	.0	.0	.0	.00	.00	.00	NA
75.	.0000	0	.0	.0	.0	.00	.00	.00	NA
100.	.0000	0	.0	.0	.0	.00	.00	.00	NA
150.	4.436	1	1.0	1.4	320.0	99.92	46.62	38.61	SS
200.	11.55	1	1.0	1.4	320.0	99.92	61.58	52.58	SS
300.	14.56	1	1.0	1.4	320.0	99.92	90.71	82.09	SS
400.	14.23	3	1.0	1.6	320.0	100.05	81.71	80.00	SS
500.	12.28	3	1.0	1.6	320.0	100.05	100.42	100.00	SS
600.	11.85	4	1.0	1.8	320.0	99.84	86.21	77.33	SS
700.	11.00	4	1.0	1.8	320.0	99.84	98.99	89.09	SS
800.	9.912	4	1.0	1.8	320.0	99.84	111.41	100.58	SS
900.	8.838	4	1.0	1.8	320.0	99.84	123.48	111.81	SS
1000.	7.867	4	1.0	1.8	320.0	99.84	135.22	122.79	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	240.2	CONC (UG/M**3)	=	436.1
CRIT WS @10M (M/S)	=	1.00	CRIT WS @10M (M/S)	=	1.00
CRIT WS @ HS (M/S)	=	1.57	CRIT WS @ HS (M/S)	=	1.57
DILUTION WS (M/S)	=	1.00	DILUTION WS (M/S)	=	1.00
CAVITY HT (M)	=	205.53	CAVITY HT (M)	=	185.17

```
  CAVITY LENGTH (M)  =    121.49          CAVITY LENGTH (M)  =     53.05
  ALONGWIND DIM (M)  =     16.80          ALONGWIND DIM (M)  =     30.50

**************************************
     END OF CAVITY CALCULATIONS
**************************************


     **************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     **************************************

 CALCULATION         MAX CONC     DIST TO    TERRAIN
  PROCEDURE         (UG/M**3)     MAX (M)     HT (M)
--------------     -----------    -------    -------
SIMPLE TERRAIN       14.56           300.         0.

BLDG. CAVITY-1       240.2           121.        --   (DIST = CAVITY LENGTH)

BLDG. CAVITY-2       436.1            53.        --   (DIST = CAVITY LENGTH)


**************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
**************************************************
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*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

SCREEN3 Modeling File for Parcel 7 Boiler 4

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	27.4000
STK INSIDE DIAM (M)	=	.1800
STK EXIT VELOCITY (M/S)	=	8.5000
STK GAS EXIT TEMP (K)	=	293.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	URBAN
BUILDING HEIGHT (M)	=	24.4000
MIN HORIZ BLDG DIM (M)	=	18.3000
MAX HORIZ BLDG DIM (M)	=	55.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = .585 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	0	.0	.0	.0	.00	.00	.00	NA
75.	360.3	5	1.0	1.4	10000.0	27.41	8.13	14.95	SS
100.	329.1	5	1.0	1.4	10000.0	27.41	10.79	16.40	SS
150.	277.6	5	1.0	1.4	10000.0	27.41	16.03	19.31	SS
200.	233.7	5	1.0	1.4	10000.0	27.41	21.17	22.23	SS
300.	166.8	5	1.0	1.4	10000.0	27.41	31.18	28.25	SS
400.	123.6	5	1.0	1.4	10000.0	27.41	40.85	32.97	SS
500.	95.80	5	1.0	1.4	10000.0	27.41	50.21	37.38	SS
600.	76.88	5	1.0	1.4	10000.0	27.41	59.27	41.52	SS
700.	63.43	5	1.0	1.4	10000.0	27.41	68.06	45.42	SS
800.	53.51	5	1.0	1.4	10000.0	27.41	76.59	49.12	SS
900.	45.96	5	1.0	1.4	10000.0	27.41	84.89	52.65	SS
1000.	40.07	5	1.0	1.4	10000.0	27.41	92.97	56.02	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	496.8	CONC (UG/M**3)	=	.0000
CRIT WS @10M (M/S)	=	1.00	CRIT WS @10M (M/S)	=	99.99
CRIT WS @ HS (M/S)	=	1.22	CRIT WS @ HS (M/S)	=	99.99
DILUTION WS (M/S)	=	1.00	DILUTION WS (M/S)	=	99.99
CAVITY HT (M)	=	39.13	CAVITY HT (M)	=	26.48

```
  CAVITY LENGTH (M)  =    80.35         CAVITY LENGTH (M)  =    26.97
  ALONGWIND DIM (M)  =    18.30         ALONGWIND DIM (M)  =    55.00

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S.  CONC SET = 0.0

**************************************
      END OF CAVITY CALCULATIONS
**************************************


     **************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     **************************************

 CALCULATION         MAX CONC     DIST TO    TERRAIN
  PROCEDURE         (UG/M**3)     MAX (M)     HT (M)
--------------     -----------   -------    -------
SIMPLE TERRAIN       360.3           75.         0.

BLDG. CAVITY-1       496.8           80.        --   (DIST = CAVITY LENGTH)

BLDG. CAVITY-2       .0000           27.        --   (DIST = CAVITY LENGTH)


**************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
**************************************************
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07/15/08
14:07:34

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

SCREEN3 Modeling File for Parcel 7 Egen 4

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	27.4000
STK INSIDE DIAM (M)	=	.1000
STK EXIT VELOCITY (M/S)	=	62.7000
STK GAS EXIT TEMP (K)	=	883.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	URBAN
BUILDING HEIGHT (M)	=	24.4000
MIN HORIZ BLDG DIM (M)	=	18.3000
MAX HORIZ BLDG DIM (M)	=	55.0000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = 1.027 M**4/S**3; MOM. FLUX = 3.261 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	0	.0	.0	.0	.00	.00	.00	NA
75.	191.8	1	1.0	1.2	320.0	28.59	23.65	18.66	SS
100.	211.5	3	1.0	1.2	320.0	28.95	21.57	20.00	SS
150.	188.1	4	1.0	1.3	320.0	29.21	23.31	20.54	SS
200.	166.0	4	1.0	1.3	320.0	29.21	30.79	27.20	SS
300.	131.9	6	1.0	1.4	10000.0	31.36	31.18	23.52	SS
400.	110.4	6	1.0	1.4	10000.0	31.36	40.85	28.60	SS
500.	90.32	6	1.0	1.4	10000.0	31.36	50.21	33.30	SS
600.	74.51	6	1.0	1.4	10000.0	31.36	59.27	37.68	SS
700.	62.41	6	1.0	1.4	10000.0	31.36	68.06	41.80	SS
800.	53.12	6	1.0	1.4	10000.0	31.36	76.59	45.69	SS
900.	45.87	6	1.0	1.4	10000.0	31.36	84.89	49.38	SS
1000.	40.13	6	1.0	1.4	10000.0	31.36	92.97	52.90	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	496.8	CONC (UG/M**3)	=	.0000
CRIT WS @10M (M/S)	=	1.00	CRIT WS @10M (M/S)	=	99.99
CRIT WS @ HS (M/S)	=	1.22	CRIT WS @ HS (M/S)	=	99.99
DILUTION WS (M/S)	=	1.00	DILUTION WS (M/S)	=	99.99
CAVITY HT (M)	=	39.13	CAVITY HT (M)	=	26.48

```
  CAVITY LENGTH (M)  =     80.35         CAVITY LENGTH (M)  =     26.97
  ALONGWIND DIM (M)  =     18.30         ALONGWIND DIM (M)  =     55.00

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S.  CONC SET = 0.0

**************************************
      END OF CAVITY CALCULATIONS
**************************************


     **************************************
     *** SUMMARY OF SCREEN MODEL RESULTS ***
     **************************************

 CALCULATION         MAX CONC     DIST TO    TERRAIN
  PROCEDURE         (UG/M**3)     MAX (M)     HT (M)
--------------     -----------   -------    -------
SIMPLE TERRAIN       211.5          100.         0.

BLDG. CAVITY-1       496.8           80.        --   (DIST = CAVITY LENGTH)

BLDG. CAVITY-2       .0000           27.        --   (DIST = CAVITY LENGTH)


**************************************************
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
**************************************************
```

07/21/08
14:02:31

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

SCREEN3 Modeling File for Parcel 7 Below Grade Garage

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	6.1000
STK INSIDE DIAM (M)	=	.3050
STK EXIT VELOCITY (M/S)	=	.0000
STK GAS EXIT TEMP (K)	=	293.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	URBAN
BUILDING HEIGHT (M)	=	91.0000
MIN HORIZ BLDG DIM (M)	=	16.8000
MAX HORIZ BLDG DIM (M)	=	30.5000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = .000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	0	.0	.0	.0	.00	.00	.00	NA
75.	.0000	0	.0	.0	.0	.00	.00	.00	NA
100.	.0000	0	.0	.0	.0	.00	.00	.00	NA
150.	706.5	5	1.0	1.0	10000.0	6.10	16.03	27.43	SS
200.	479.1	5	1.0	1.0	10000.0	6.10	21.17	30.78	SS
300.	268.8	5	1.0	1.0	10000.0	6.10	31.18	37.48	SS
400.	176.1	5	1.0	1.0	10000.0	6.10	40.85	43.83	SS
500.	132.1	5	1.0	1.0	10000.0	6.10	50.21	47.61	SS
600.	104.1	5	1.0	1.0	10000.0	6.10	59.27	51.21	SS
700.	85.06	5	1.0	1.0	10000.0	6.10	68.06	54.64	SS
800.	71.34	5	1.0	1.0	10000.0	6.10	76.59	57.93	SS
900.	61.07	5	1.0	1.0	10000.0	6.10	84.89	61.09	SS
1000.	53.15	5	1.0	1.0	10000.0	6.10	92.97	64.13	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	240.2	CONC (UG/M**3)	=	436.1
CRIT WS @10M (M/S)	=	1.00	CRIT WS @10M (M/S)	=	1.00
CRIT WS @ HS (M/S)	=	1.00	CRIT WS @ HS (M/S)	=	1.00
DILUTION WS (M/S)	=	1.00	DILUTION WS (M/S)	=	1.00
CAVITY HT (M)	=	205.53	CAVITY HT (M)	=	185.17

CAVITY LENGTH (M)	=	121.49	CAVITY LENGTH (M)	=	53.05
ALONGWIND DIM (M)	=	16.80	ALONGWIND DIM (M)	=	30.50

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)	
SIMPLE TERRAIN	706.5	150.	0.	
BLDG. CAVITY-1	240.2	121.	--	(DIST = CAVITY LENGTH)
BLDG. CAVITY-2	436.1	53.	--	(DIST = CAVITY LENGTH)

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

07/21/08
15:12:04

*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

SCREEN3 Modeling File for Parcel 7 Loading Dock Emissions

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.00000
STACK HEIGHT (M)	=	6.1000
STK INSIDE DIAM (M)	=	.3050
STK EXIT VELOCITY (M/S)	=	.0000
STK GAS EXIT TEMP (K)	=	293.0000
AMBIENT AIR TEMP (K)	=	293.0000
RECEPTOR HEIGHT (M)	=	.0000
URBAN/RURAL OPTION	=	URBAN
BUILDING HEIGHT (M)	=	91.0000
MIN HORIZ BLDG DIM (M)	=	16.8000
MAX HORIZ BLDG DIM (M)	=	30.5000

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = .000 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
50.	.0000	0	.0	.0	.0	.00	.00	.00	NA
75.	.0000	0	.0	.0	.0	.00	.00	.00	NA
100.	.0000	0	.0	.0	.0	.00	.00	.00	NA
150.	706.5	5	1.0	1.0	10000.0	6.10	16.03	27.43	SS
200.	479.1	5	1.0	1.0	10000.0	6.10	21.17	30.78	SS
300.	268.8	5	1.0	1.0	10000.0	6.10	31.18	37.48	SS
400.	176.1	5	1.0	1.0	10000.0	6.10	40.85	43.83	SS
500.	132.1	5	1.0	1.0	10000.0	6.10	50.21	47.61	SS
600.	104.1	5	1.0	1.0	10000.0	6.10	59.27	51.21	SS
700.	85.06	5	1.0	1.0	10000.0	6.10	68.06	54.64	SS
800.	71.34	5	1.0	1.0	10000.0	6.10	76.59	57.93	SS
900.	61.07	5	1.0	1.0	10000.0	6.10	84.89	61.09	SS
1000.	53.15	5	1.0	1.0	10000.0	6.10	92.97	64.13	SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** REGULATORY (Default) ***
PERFORMING CAVITY CALCULATIONS
WITH ORIGINAL SCREEN CAVITY MODEL
(BRODE, 1988)
****

*** CAVITY CALCULATION - 1 ***			*** CAVITY CALCULATION - 2 ***		
CONC (UG/M**3)	=	240.2	CONC (UG/M**3)	=	436.1
CRIT WS @10M (M/S)	=	1.00	CRIT WS @10M (M/S)	=	1.00
CRIT WS @ HS (M/S)	=	1.00	CRIT WS @ HS (M/S)	=	1.00
DILUTION WS (M/S)	=	1.00	DILUTION WS (M/S)	=	1.00
CAVITY HT (M)	=	205.53	CAVITY HT (M)	=	185.17

CAVITY LENGTH (M) = 121.49 CAVITY LENGTH (M) = 53.05
ALONGWIND DIM (M) = 16.80 ALONGWIND DIM (M) = 30.50

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)	
SIMPLE TERRAIN	706.5	150.	0.	
BLDG. CAVITY-1	240.2	121.	--	(DIST = CAVITY LENGTH)
BLDG. CAVITY-2	436.1	53.	--	(DIST = CAVITY LENGTH)

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

Emergency Generator Emissions

Parcel 7																	
Potential Emissions																	
Unit	Output		Input		MMBtu/hr		Emission Rate					Units	Hours	Annual Emissions - tpy			
						NOx	CO	VOC	PM	SO2			NOx	CO	VOC	PM	SO2
Egen#1	450	kW	610	BHP	464	3.000	2.6000	1.0000	0.1500	0.0474	g/bhphr	300	0.60	0.52	0.20	0.03	0.01
Egen#1	350	kW	475	BHP	361	3.000	2.6000	1.0000	0.1500	0.0474	g/bhphr	300	0.47	0.41	0.16	0.02	0.01
Egen#1	450	kW	610	BHP	464	3.000	2.6000	1.0000	0.1500	0.0474	g/bhphr	300	0.60	0.52	0.20	0.03	0.01
Egen#4	150	kW	203	BHP	155	3.000	2.6000	1.0000	0.1500	0.0474	g/bhphr	300	0.20	0.17	0.07	0.01	0.00
									Total Emergency Generators:				1.88	1.63	0.63	0.09	0.03
Boiler 1	3.85	MMBtu/hr			3.850	0.035	0.08	0.03	0.01	0.01	lb/MMBtu	8,760	0.59	1.35	0.51	0.17	0.169
Boiler 2	5.00	MMBtu/hr			5.000	0.035	0.08	0.03	0.01	0.01	lb/MMBtu	8,760	0.77	1.75	0.66	0.22	0.219
Boiler 3	6.50	MMBtu/hr			6.500	0.035	0.08	0.03	0.01	0.01	lb/MMBtu	8,760	1.00	2.28	0.85	0.28	0.285
Boiler 4	2.70	MMBtu/hr			2.700	0.035	0.08	0.03	0.01	0.01	lb/MMBtu	8,760	0.41	0.95	0.35	0.12	0.118
Boilers Total	18.05	MMBtu/hr			18.050	0.035	0.08	0.03	0.01	0.01	lb/MMBtu		2.77	6.32	2.37	0.79	0.79
												Total	7.42	14.28	5.37	1.68	1.61

Unit	Output		Input		MMBtu/hr	short term per unit(g/s)						Hours	long term per unit (g/s)				
						NOx	CO	VOC	PM	SO2			NOx	CO	VOC	PM	SO2
Egen#1	450	kW	610	BHP	464	0.51	0.44	0.17	0.03	0.01		300	0.017	0.015	0.006	0.001	0.000
Egen#1	350	kW	475	BHP	361	0.40	0.34	0.13	0.02	0.01		300	0.014	0.012	0.005	0.001	0.000
Egen#1	450	kW	610	BHP	464	0.51	0.44	0.17	0.03	0.01		300	0.017	0.015	0.006	0.001	0.000
Egen#4	150	kW	203	BHP	155	0.17	0.15	0.06	0.01	0.00		300	0.006	0.005	0.002	0.000	0.000
Boiler 1	3.85	MMBtu/hr			3.850	0.02	0.04	0.01	0.005	0.005		8760	0.017	0.039	0.015	0.005	0.005
Boiler 2	5.00	MMBtu/hr			5.000	0.02	0.05	0.02	0.006	0.006		8760	0.022	0.050	0.019	0.006	0.006
Boiler 3	6.50	MMBtu/hr			6.500	0.03	0.07	0.02	0.008	0.008		8760	0.029	0.066	0.025	0.008	0.008
Boiler 4	2.70	MMBtu/hr			2.700	0.01	0.03	0.01	0.003	0.003		8760	0.012	0.027	0.010	0.003	0.003

Modeling Parameters

Unit	Egen#1	Egen #2	Egen #3	Egen#4	Boilers 1	Boilers 2	Boilers 3	Boilers 4	
flow (per unit)	3,951	3,333	3,951	1077	36000	36000	36000	36000	cfm
Diam	8	6	8	4	8.0	10.0	11.0	7.0	inches
Diam	0.67	0.50	0.67	0.33	0.7	0.8	0.9	0.6	ft
Area	0.35	0.20	0.35	0.09	20.00	18.18	17.14	21.43	ft2
Flow	188.6	282.9	188.6	205.7	30	33	35	28	fps
Flow	57.5	86.2	57.5	62.7	9.1	10.1	10.7	8.5	mps
Temp	917.6	919.2	917.6	1130	67.5	67.5	67.5	67.5	F
Temp	765	766	765	883	293	293	293	293	K
Stack Elev	90	156	309	90	90	156	309	90	ft agl
Stack Elev	27	48	94	27	27	48	94	27	m agl
Ground Elev	0			0	0	0	0	0	ft asl

Note 1: All stacks are 10 feet above roof level

Mesoscale Analysis

Table

Mesoscale Analysis Summary

Boston, MA

Parcel 7

Pollutant	Time	Units	Existing	Full Build	No-Build	Build - No Build	% Difference (Build-No Build)	Build with Mitigation	Build with Mitigation -No Build)	% Difference (Build with Mitigation - No Build)
VOC	Daily	Tons Per Day	0.264	0.180	0.175	0.0055	3.12%	0.175	0.00023	0.13%
Nox	Daily	Tons Per Day	0.637	0.413	0.401	0.0125	3.12%	0.401	0.00052	0.13%

Notes:

1. Tons per day estimated by assuming hourly peak represents 10 percent of the daily totals

Table

Green House Gas Analysis Summary

Boston, MA

Parcel 7

Pollutant	Time	Units	Existing	Full Build	No-Build	Build - No Build	% Difference (Build-No Build)	Build with Mitigation	Build with Mitigation - No Build)	% Difference (Build with Mitigation - No Build)
CO2	Daily	Tons Per Day	265.7	301.0	291.8	9.1113	3.12%	292.2	0.4	0.13%
	Annual	Tons Per Year	96,976	109,848.6	106,523.0	3,325.6	3.12%	106,661.9	138.9	0.13%

Notes:

1. Tons per day estimated by assuming hourly peak represents 10 percent of the daily totals
2. Tons per year estimated by assuming tons per day multiplied by 365 days per year.

	A	B	C	E	F	G	H	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
1	**Parcel 7**																							
2																								
3	Mesoscale Analysis																							
4	Existing Conditions																							
5																		MOBILE6 Emission Rates				Emissions[2]		
6		Intersection	Peak	Exist (tph)[1]	No-Build (tph)	Build (tph)	Build with Mitigation (tph)		Miles Per Intersection		Exist (miles traveled)	No-Build (miles traveled)	Build (miles traveled)	Build with Mitigation (miles traveled)		Vehicle Speed (mph)		Existing VOC g/mile	Existing Nox g/mile	Existing CO2 g/mile		VOC (tons/day)	Nox (tons/day)	CO2 (tons/day)
7	1	Commonwealth Ave/BU Bridge	AM	6024	6395	6459	6459		0.5		3012	3197.5	3229.5	3229.5		25		0.551	1.329	554.5		0.018	0.04	18.41
8			PM	6355	6772	6839	6839		0.5		3177.5	3386	3419.5	3419.5		25		0.551	1.329	554.5		0.019	0.05	19.42
9	2	Commonwealth Ave/University Rd	AM	7160	7357	7399	5666		0.5		3580	3678.5	3699.5	2833		25		0.551	1.329	554.5		0.022	0.05	21.88
10			PM	7488	5445	5225	5223		0.5		3744	2722.5	2612.5	2611.5		25		0.551	1.329	554.5		0.023	0.05	22.88
11	3	Mountfort St/St Mary's	AM	1823	1709	1763	1763		0.5		911.5	854.5	881.5	881.5		25		0.551	1.329	554.5		0.006	0.01	5.57
12			PM	1823	2165	2232	2232		0.5		911.5	1082.5	1116	1116		25		0.551	1.329	554.5		0.006	0.01	5.57
13	4	Audobon Circle	AM	3190	3632	4324	4147		0.5		1595	1816	2162	2073.5		25		0.551	1.329	554.5		0.010	0.02	9.75
14			PM	3180	3745	4553	4461		0.5		1590	1872.5	2276.5	2230.5		25		0.551	1.329	554.5		0.010	0.02	9.72
15	5	Sears Rotary (Brookline Ave at Fenway	AM	4030	4970	4919	4678		0.5		2015	2485	2459.5	2339		25		0.551	1.329	554.5		0.012	0.03	12.32
16			PM	3780	4829	4906	4669		0.5		1890	2414.5	2453	2334.5		25		0.551	1.329	554.5		0.011	0.03	11.55
17	6	Sears Rotary (Brookline Ave at Park Drive	AM	4240	5240	5339	5027		0.4		1696	2096	2135.6	2010.8		25		0.551	1.329	554.5		0.010	0.02	10.37
18			PM	4535	5540	5546	5279		0.4		1814	2216	2218.4	2111.6		25		0.551	1.329	554.5		0.011	0.03	11.09
19	7	Kenmore Square (Commonwealth Ave at Beacon)	AM	3985	4103	4305	4305		0.5		1992.5	2051.5	2152.5	2152.5		25		0.551	1.329	554.5		0.012	0.03	12.18
20			PM	4170	4301	4519	4519		0.5		2085	2150.5	2259.5	2259.5		25		0.551	1.329	554.5		0.013	0.03	12.74
21	8	Beacon Street at Storrow Drive Offramp	AM	1743	1557	1688	1688		0.2		348.6	311.4	337.6	337.6		25		0.551	1.329	554.5		0.002	0.01	2.13
22			PM	1514	1775	1827	1827		0.2		302.8	355	365.4	365.4		25		0.551	1.329	554.5		0.002	0.00	1.85
23	9	Boylston Street at Bowker Overpass	AM	4630	5143	5154	5154		0.5		2315	2571.5	2577	2577		25		0.551	1.329	554.5		0.014	0.03	14.15
24			PM	4684	5173	5187	5187		0.5		2342	2586.5	2593.5	2593.5		25		0.551	1.329	554.5		0.014	0.03	14.31
25	10	Boylston Street at Yawkey Way	AM	2516	3258	3267	3267		0.5		1258	1629	1633.5	1633.5		25		0.551	1.329	554.5		0.008	0.02	7.69
26			PM	2752	3012	3016	3016		0.5		1376	1506	1508	1508		25		0.551	1.329	554.5		0.008	0.02	8.41
27	11	Beacon Street at Arundel Street	AM	1690	1653	1718	1656		0.5		845	826.5	859	828		25		0.551	1.329	554.5		0.005	0.01	5.16
28			PM	1629	1718	1781	1749		0.5		814.5	859	890.5	874.5		25		0.551	1.329	554.5		0.005	0.01	4.98
29	12	Beacon Street at Mountfort Street	AM	1720	1758	1927	2047		0.5		860	879	963.5	1023.5		25		0.551	1.329	554.5		0.005	0.01	5.26
30			PM	1739	1712	1944	2004		0.5		869.5	856	972	1002		25		0.551	1.329	554.5		0.005	0.01	5.31
31	13	Brookline Ave at Newbury Street	AM	930	1100	1139	1139		0.5		465	550	569.5	569.5		25		0.551	1.329	554.5		0.003	0.01	2.84
32			PM	1020	1008	1049	1049		0.5		510	504	524.5	524.5		25		0.551	1.329	554.5		0.003	0.01	3.12
33	14	Mountfort Street at Park Drive	AM	1529	1555	1609	1649		0.5		764.5	777.5	804.5	824.5		25		0.551	1.329	554.5		0.005	0.01	4.67
34			PM	766	1868	1935	1932		0.5		383	934	967.5	966		25		0.551	1.329	554.5		0.002	0.01	2.34
35																								
36	Notes:																							
37		Total	AM	45210	49430	49277	48645		Totals		21658.1	23723.9	23598.2	23313.4							Totals (tons/day)	0.264	0.637	265.687
38			PM	45435	51410	50559	49986				21809.8	24618.5	24176.8	23917										
39																								
40		1.TPH denotes trips per hour based on traffic study																						
41		2.Emissions in tons per day were based on peak hourly traffic assuming the peak hour represents 10 percent of the total volume.																						

	A	B	C	E	F	G	H	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
1	**Parcel 7**																							
2																								
3	Mesoscale Analysis																							
4	No-Build Conditions																	MOBILE6 Emission Rates				Emissions[2]		
5																								
6		Intersection	Peak	Exist (tph)[1]	No-Build (tph)	Build (tph)	Build with Mitigation (tph)		Miles Per Intersection		Exist (miles traveled)	No-Build (miles traveled)	Build (miles traveled)	Build with Mitigation (miles traveled)		Vehicle Speed (mph)		Existing VOC g/mile	Existing Nox g/mile	Existing CO2 g/mile		VOC (tons/day)	Nox (tons/day)	CO2 (tons/day)
7	1	Commonwealth Ave/BU Bridge	AM	6024	6395	6459	6459		0.5		3012	3197.5	3229.5	3229.5		25		0.336	0.771	561.3		0.012	0.03	19.78
8			PM	6355	6772	6839	6839		0.5		3177.5	3386	3419.5	3419.5		25		0.336	0.771	561.3		0.013	0.03	20.95
9	2	Commonwealth Ave/University Rd	AM	7160	7357	7399	5666		0.5		3580	3678.5	3699.5	2833		25		0.336	0.771	561.3		0.014	0.03	22.76
10			PM	7488	5445	5225	5223		0.5		3744	2722.5	2612.5	2611.5		25		0.336	0.771	561.3		0.010	0.02	16.84
11	3	Mountfort St/St Mary's	AM	1823	1709	1763	1763		0.5		911.5	854.5	881.5	881.5		25		0.336	0.771	561.3		0.003	0.01	5.29
12			PM	1823	2165	2232	2232		0.5		911.5	1082.5	1116	1116		25		0.336	0.771	561.3		0.004	0.01	6.70
13	4	Audobon Circle	AM	3190	3632	4324	4147		0.5		1595	1816	2162	2073.5		25		0.336	0.771	561.3		0.007	0.02	11.24
14			PM	3180	3745	4553	4461		0.5		1590	1872.5	2276.5	2230.5		25		0.336	0.771	561.3		0.007	0.02	11.59
15	5	Sears Rotary (Brookline Ave at Fenway	AM	4030	4970	4919	4678		0.5		2015	2485	2459.5	2339		25		0.336	0.771	561.3		0.009	0.02	15.38
16			PM	3780	4829	4906	4669		0.5		1890	2414.5	2453	2334.5		25		0.336	0.771	561.3		0.009	0.02	14.94
17	6	Sears Rotary (Brookline Ave at Park Drive	AM	4240	5240	5339	5027		0.4		1696	2096	2135.6	2010.8		25		0.336	0.771	561.3		0.008	0.02	12.97
18			PM	4535	5540	5546	5279		0.4		1814	2216	2218.4	2111.6		25		0.336	0.771	561.3		0.008	0.02	13.71
19	7	Kenmore Square (Commonwealth Ave at Beacon)	AM	3985	4103	4305	4305		0.5		1992.5	2051.5	2152.5	2152.5		25		0.336	0.771	561.3		0.008	0.02	12.69
20			PM	4170	4301	4519	4519		0.5		2085	2150.5	2259.5	2259.5		25		0.336	0.771	561.3		0.008	0.02	13.31
21	8	Beacon Street at Storrow Drive Offramp	AM	1743	1557	1688	1688		0.2		348.6	311.4	337.6	337.6		25		0.336	0.771	561.3		0.001	0.00	1.93
22			PM	1514	1775	1827	1827		0.2		302.8	355	365.4	365.4		25		0.336	0.771	561.3		0.001	0.00	2.20
23	9	Boylston Street at Bowker Overpass	AM	4630	5143	5154	5154		0.5		2315	2571.5	2577	2577		25		0.336	0.771	561.3		0.010	0.02	15.91
24			PM	4684	5173	5187	5187		0.5		2342	2586.5	2593.5	2593.5		25		0.336	0.771	561.3		0.010	0.02	16.00
25	10	Boylston Street at Yawkey Way	AM	2516	3258	3267	3267		0.5		1258	1629	1633.5	1633.5		25		0.336	0.771	561.3		0.006	0.01	10.08
26			PM	2752	3012	3016	3016		0.5		1376	1508	1508	1508		25		0.336	0.771	561.3		0.006	0.01	9.32
27	11	Beacon Street at Arundel Street	AM	1690	1653	1718	1656		0.5		845	826.5	859	828		25		0.336	0.771	561.3		0.003	0.01	5.11
28			PM	1629	1718	1781	1749		0.5		814.5	859	890.5	874.5		25		0.336	0.771	561.3		0.003	0.01	5.31
29	12	Beacon Street at Mountfort Street	AM	1720	1758	1927	2047		0.5		860	879	963.5	1023.5		25		0.336	0.771	561.3		0.003	0.01	5.44
30			PM	1739	1712	1944	2004		0.5		869.5	856	972	1002		25		0.336	0.771	561.3		0.003	0.01	5.30
31	13	Brookline Ave at Newbury Street	AM	930	1100	1139	1139		0.5		465	550	569.5	569.5		25		0.336	0.771	561.3		0.002	0.00	3.40
32			PM	1020	1008	1049	1049		0.5		510	504	524.5	524.5		25		0.336	0.771	561.3		0.002	0.00	3.12
33	14	Mountfort Street at Park Drive	AM	1529	1555	1609	1649		0.5		764.5	777.5	804.5	824.5		25		0.336	0.771	561.3		0.003	0.01	4.81
34			PM	766	1868	1935	1932		0.5		383	934	967.5	966		25		0.336	0.771	561.3		0.003	0.01	5.78
35																								
36	Notes:																							
37		Total	AM	45210	49430	49277	48645		Totals		21658.1	23723.9	23598.2	23313.4							Totals (tons/day)	0.175	0.401	291.844
38			PM	45435	51410	50559					21809.8	24618.5	24176.8											
39																								
40		1.TPH denotes trips per hour based on traffic study																						
41		2.Emissions in tons per day were based on peak hourly traffic assuming the peak hour represents 10 percent of the total volume.																						

	A	B	C	E	F	G	H	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE
1	**Parcel 7**																							
2																								
3	Mesoscale Analysis																							
4	Build Conditions																							
5																		MOBILE6 Emission Rates				Emissions[2]		
6		Intersection	Peak	Exist (tph)[1]	No-Build (tph)	Build (tph)	Build with Mitigation (tph)		Miles Per Intersection		Exist (miles traveled)	No-Build (miles traveled)	Build (miles traveled)	Build with Mitigation (miles traveled)		Vehicle Speed (mph)		Existing VOC g/mile	Existing Nox g/mile	Existing CO2 g/mile		VOC (tons/day)	Nox (tons/day)	CO2 (tons/day)
7	1	Commonwealth Ave/BU Bridge	AM	6024	6395	6459	6459		0.5		3012	3197.5	3229.5	3229.5		25		0.336	0.771	561.3		0.012	0.03	19.98
8			PM	6355	6772	6839	6839		0.5		3177.5	3386	3419.5	3419.5		25		0.336	0.771	561.3		0.013	0.03	21.16
9	2	Commonwealth Ave/University Rd	AM	7160	7357	7399	5666		0.5		3580	3678.5	3699.5	2833		25		0.336	0.771	561.3		0.014	0.03	22.89
10			PM	7468	5445	5225	5223		0.5		3744	2722.5	2612.5	2611.5		25		0.336	0.771	561.3		0.010	0.02	16.16
11	3	Mountfort St/St Mary's	AM	1823	1709	1763	1763		0.5		911.5	854.5	881.5	881.5		25		0.336	0.771	561.3		0.003	0.01	5.45
12			PM	1823	2165	2232	2232		0.5		911.5	1082.5	1116	1116		25		0.336	0.771	561.3		0.004	0.01	6.90
13	4	Audobon Circle	AM	3190	3632	4324	4147		0.5		1595	1816	2162	2073.5		25		0.336	0.771	561.3		0.008	0.02	13.38
14			PM	3180	3745	4553	4461		0.5		1590	1872.5	2276.5	2230.5		25		0.336	0.771	561.3		0.008	0.02	14.09
15	5	Sears Rotary (Brookline Ave at Fenway	AM	4030	4970	4919	4678		0.5		2015	2485	2459.5	2339		25		0.336	0.771	561.3		0.009	0.02	15.22
16			PM	3780	4829	4906	4669		0.5		1890	2414.5	2453	2334.5		25		0.336	0.771	561.3		0.009	0.02	15.18
17	6	Sears Rotary (Brookline Ave at Park Drive	AM	4240	5240	5339	5027		0.4		1696	2096	2135.6	2010.8		25		0.336	0.771	561.3		0.008	0.02	13.21
18			PM	4535	5540	5546	5279		0.4		1814	2216	2218.4	2111.6		25		0.336	0.771	561.3		0.008	0.02	13.73
19	7	Kenmore Square (Commonwealth Ave at Beacon)	AM	3985	4103	4305	4305		0.5		1992.5	2051.5	2152.5	2152.5		25		0.336	0.771	561.3		0.008	0.02	13.32
20			PM	4170	4301	4519	4519		0.5		2085	2150.5	2259.5	2259.5		25		0.336	0.771	561.3		0.008	0.02	13.98
21	8	Beacon Street at Storrow Drive Offramp	AM	1743	1557	1688	1688		0.2		348.6	311.4	337.6	337.6		25		0.336	0.771	561.3		0.001	0.00	2.09
22			PM	1514	1775	1827	1827		0.2		302.8	355	365.4	365.4		25		0.336	0.771	561.3		0.001	0.00	2.26
23	9	Boylston Street at Bowker Overpass	AM	4630	5143	5154	5154		0.5		2315	2571.5	2577	2577		25		0.336	0.771	561.3		0.010	0.02	15.94
24			PM	4684	5173	5187	5187		0.5		2342	2586.5	2593.5	2593.5		25		0.336	0.771	561.3		0.010	0.02	16.05
25	10	Boylston Street at Yawkey Way	AM	2516	3258	3267	3267		0.5		1258	1629	1633.5	1633.5		25		0.336	0.771	561.3		0.006	0.01	10.11
26			PM	2752	3012	3016	3016		0.5		1376	1506	1508	1508		25		0.336	0.771	561.3		0.006	0.01	9.33
27	11	Beacon Street at Arundel Street	AM	1690	1653	1718	1656		0.5		845	826.5	859	828		25		0.336	0.771	561.3		0.003	0.01	5.31
28			PM	1629	1718	1781	1749		0.5		814.5	859	890.5	874.5		25		0.336	0.771	561.3		0.003	0.01	5.51
29	12	Beacon Street at Mountfort Street	AM	1720	1758	1927	2047		0.5		860	879	963.5	1023.5		25		0.336	0.771	561.3		0.004	0.01	5.96
30			PM	1739	1712	1944	2004		0.5		869.5	856	972	1002		25		0.336	0.771	561.3		0.004	0.01	6.01
31	13	Brookline Ave at Newbury Street	AM	930	1100	1139	1139		0.5		465	550	569.5	569.5		25		0.336	0.771	561.3		0.002	0.00	3.52
32			PM	1020	1008	1049	1049		0.5		510	504	524.5	524.5		25		0.336	0.771	561.3		0.002	0.00	3.25
33	14	Mountfort Street at Park Drive	AM	1529	1555	1609	1649		0.5		764.5	777.5	804.5	824.5		25		0.336	0.771	561.3		0.003	0.01	4.98
34			PM	766	1868	1935	1932		0.5		383	934	967.5	966		25		0.336	0.771	561.3		0.004	0.01	5.99
35																								
36	Notes:																							
37		Total	AM	45210	49430	49277	48645		Totals		21658.1	23723.9	23598.2	23313.4							Totals (tons/day)	0.180	0.413	300.965
38			PM	45435	51410	50559					21809.8	24618.5	24176.8											
39																								
40		1.TPH denotes trips per hour based on traffic study																						
41		2.Emissions in tons per day were based on peak hourly traffic assuming the peak hour represents 10 percent of the total volume.																						

1	**Parcel 7**																							
2																								
3	Mesoscale Analysis																							
4	Build With Mitigation Conditions																							
5																		MOBILE6 Emission Rates				Emissions[2]		
6		Intersection	Peak	Exist (tph)[1]	No-Build (tph)	Build (tph)	Build with Mitigation (tph)		Miles Per Intersection		Exist (miles traveled)	No-Build (miles traveled)	Build (miles traveled)	Build with Mitigation (miles traveled)		Vehicle Speed (mph)		Existing VOC g/mile	Existing Nox g/mile	Existing CO2 g/mile		VOC (tons/day)	Nox (tons/day)	CO2 (tons/day)
7	1	Commonwealth Ave/BU Bridge	AM	6024	6395	6459	6459		0.5		3012	3197.5	3229.5	3229.5		25		0.336	0.771	561.3		0.012	0.03	19.98
8			PM	6355	6772	6839	6839		0.5		3177.5	3386	3419.5	3419.5		25		0.336	0.771	561.3		0.013	0.03	21.16
9	2	Commonwealth Ave/University Rd	AM	7160	7357	7399	5666		0.5		3580	3678.5	3699.5	2833		25		0.336	0.771	561.3		0.010	0.02	17.53
10			PM	7488	5445	5225	5223		0.5		3744	2722.5	2612.5	2611.5		25		0.336	0.771	561.3		0.010	0.02	16.16
11	3	Mountfort St/St Mary's	AM	1823	1709	1763	1763		0.5		911.5	854.5	881.5	881.5		25		0.336	0.771	561.3		0.003	0.01	5.45
12			PM	1823	2165	2232	2232		0.5		911.5	1082.5	1116	1116		25		0.336	0.771	561.3		0.004	0.01	6.90
13	4	Audobon Circle	AM	3190	3632	4324	4147		0.5		1595	1816	2162	2073.5		25		0.336	0.771	561.3		0.008	0.02	12.83
14			PM	3180	3745	4553	4461		0.5		1590	1872.5	2276.5	2230.5		25		0.336	0.771	561.3		0.008	0.02	13.80
15	5	Sears Rotary (Brookline Ave at Fenway	AM	4030	4970	4919	4678		0.5		2015	2485	2459.5	2339		25		0.336	0.771	561.3		0.009	0.02	14.47
16			PM	3780	4829	4906	4669		0.5		1890	2414.5	2453	2334.5		25		0.336	0.771	561.3		0.009	0.02	14.44
17	6	Sears Rotary (Brookline Ave at Park Drive	AM	4240	5240	5339	5027		0.4		1696	2096	2135.6	2010.8		25		0.336	0.771	561.3		0.007	0.02	12.44
18			PM	4535	5540	5546	5279		0.4		1814	2216	2218.4	2111.6		25		0.336	0.771	561.3		0.008	0.02	13.06
19	7	Kenmore Square (Commonwealth Ave at Beacon)	AM	3985	4103	4305	4305		0.5		1992.5	2051.5	2152.5	2152.5		25		0.336	0.771	561.3		0.008	0.02	13.32
20			PM	4170	4301	4519	4519		0.5		2085	2150.5	2259.5	2259.5		25		0.336	0.771	561.3		0.008	0.02	13.98
21	8	Beacon Street at Storrow Drive Offramp	AM	1743	1557	1688	1688		0.2		348.6	311.4	337.6	337.6		25		0.336	0.771	561.3		0.001	0.00	2.09
22			PM	1514	1775	1827	1827		0.2		302.8	355	365.4	365.4		25		0.336	0.771	561.3		0.001	0.00	2.26
23	9	Boylston Street at Bowker Overpass	AM	4630	5143	5154	5154		0.5		2315	2571.5	2577	2577		25		0.336	0.771	561.3		0.010	0.02	15.94
24			PM	4684	5173	5187	5187		0.5		2342	2586.5	2593.5	2593.5		25		0.336	0.771	561.3		0.010	0.02	16.05
25	10	Boylston Street at Yawkey Way	AM	2516	3258	3267	3267		0.5		1258	1629	1633.5	1633.5		25		0.336	0.771	561.3		0.006	0.01	10.11
26			PM	2752	3012	3016	3016		0.5		1376	1506	1508	1508		25		0.336	0.771	561.3		0.006	0.01	9.33
27	11	Beacon Street at Arundel Street	AM	1690	1653	1718	1656		0.5		845	826.5	859	828		25		0.336	0.771	561.3		0.003	0.01	5.12
28			PM	1629	1718	1781	1749		0.5		814.5	859	890.5	874.5		25		0.336	0.771	561.3		0.003	0.01	5.41
29	12	Beacon Street at Mountfort Street	AM	1720	1758	1927	2047		0.5		860	879	963.5	1023.5		25		0.336	0.771	561.3		0.004	0.01	6.33
30			PM	1739	1712	1944	2004		0.5		869.5	856	972	1002		25		0.336	0.771	561.3		0.004	0.01	6.20
31	13	Brookline Ave at Newbury Street	AM	930	1100	1139	1139		0.5		465	550	569.5	569.5		25		0.336	0.771	561.3		0.002	0.00	3.52
32			PM	1020	1008	1049	1049		0.5		510	504	524.5	524.5		25		0.336	0.771	561.3		0.002	0.00	3.25
33	14	Mountfort Street at Park Drive	AM	1529	1555	1609	1649		0.5		764.5	777.5	804.5	824.5		25		0.336	0.771	561.3		0.003	0.01	5.10
34			PM	766	1868	1935	1932		0.5		383	934	967.5	966		25		0.336	0.771	561.3		0.004	0.01	5.98
35																								
36	Notes:																							
37		Total	AM	45210	49430	49277	48645		Totals		21658.1	23723.9	23598.2	23313.4							Totals (tons/day)	0.175	0.401	292.224
38			PM	45435	51410	50559					21809.8	24618.5	24176.8											
39																								
40		1.TPH denotes trips per hour based on traffic study																						
41		2.Emissions in tons per day were based on peak hourly traffic assuming the peak hour represents 10 percent of the total volume.																						

Greenhouse Gas Emissions Policy Analysis

MTA Parcel 7

Energy Demand GHG Emissions

	Code Baseline	Enhanced Design	LEED GHG Mitigation
Indirect Emissions			
Kilowatt-Hours/year[1]	10,650,000	9181500	8747100
BTU-Year[1]	3.63E+10	3.13E+10	2.98E+10
Megawatts per Year	1065	918	875
CO2 Pounds Per Year[2]	978735	843779.85	803858.49
CO2 Tons Per Year	489	422	402
Direct Emissions			
Gas Usage (BTU/Year)	16,700,000,000	11,040,000,000	11,270,000,000
Megawatts per Year	489.4	323.6	330.3
CO2 Pounds Per Year[2]	449804	297355	303550
CO2 Tons Per Year	224.9	148.7	151.8

Notes:
1. Derived from the eQUEST Model results
2. Based on the ISO New England average emission rates.

Consolidation of Cosentini Modeling Analysis

Cosentini Alternative	Description	System	EEMs[1]	Electric Consumption (1000 kWh)	Gas Consumption (1.0xE9)
1	Baseline	A		10,650	16.7
5	Prefered Alternative	B	3, 4,5	9,182	11.04
6	GHG Reduction	B	1,2,4,4,5,6	8,747	11.27

Notes:
Energy Efficiency Measures

1 Improved Lights
2 Overhang
3 Improved Envelope
4 Boiler
5 Chiller

The Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Deval L. Patrick
GOVERNOR

Timothy P. Murray
LIEUTENANT GOVERNOR

Ian A. Bowles
SECRETARY

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http://www.mass.gov/envir

November 28, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY & ENVIRONMENTAL AFFAIRS
ON THE
SINGLE ENVIRONMENTAL IMPACT REPORT

PROJECT NAME:	Burlington Research Center (formerly 43/63 South Avenue Redevelopment)
PROJECT MUNICIPALITY:	Burlington
PROJECT WATERSHED:	Shawsheen River
EEA NUMBER:	14173
PROJECT PROPONENT:	The Gutierrez Company
DATE NOTICED IN MONITOR:	October 22, 2008

As Secretary of Energy and Environmental Affairs, I hereby determine that the Single Environmental Impact Report (Single EIR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

Project Description

As described in the Single EIR, the project involves the redevelopment of a 16-acre site in Burlington. The proposed project entails the redevelopment an office and light industrial site with an existing total floor area of 225,000 square feet. The proposed redevelopment will consist of the demolition of the three existing buildings and the construction of a total of approximately 590,000 square feet of Class A office, research and development (R&D) and/or bio-tech/life sciences space in two buildings; 10,000 square feet of retail space; and 10,000 square foot, 250-seat restaurant. The project will provide a total of 2,180 parking spaces with a majority of these spaces to be located in a parking structure. The 16-acre site is bounded by Route 3 to the west, Second Avenue to the north, South Avenue to the east, and an auxiliary parking lot to the south. Based on the Single EIR, the project is expected to generate approximately 4,530 new vehicle trips on an average weekday, for a total of 7,020 vehicle trips (accounting for trips generated by

the existing facility). The proposed project will be connected to existing municipal water and sewer service. It will consume approximately 154,000 gallons per day (gpd) of water and will generate approximately 140,000 gpd of wastewater flow.

Jurisdiction

The project is undergoing environmental review and required the preparation of an Environmental Impact Report pursuant to Section 11.03(6)(a)(6) of the MEPA regulations because it requires state permits and because the project will generate more than 3,000 new average daily trips on roadways providing access to a single location. The project requires a State Highway Access Permit from the Massachusetts Highway Department (MassHighway) and a Sewer Connection/Extension Permit from the Department of Environmental Protection (MassDEP). The project must also obtain a new Industrial Wastewater Sewer Connection Permit from the Massachusetts Water Resources Authority (MWRA). On November 20, 2008, the MWRA informed the Proponent that a previously issued Industrial Wastewater Sewer Connection Permit issued to an industrial use at 43/63 South Avenue was no longer in effect. The permitted use went out of business in July, 2008 and the MWRA permit was not transferable, and was therefore revoked. The project will also require a National Pollutant Discharge Elimination System (NPDES) General Construction Permit from the U.S. Environmental Protection Agency (EPA). The Proponent has received a Special Permit/Site Plan Approval from the Town of Burlington (on July 17, 2008) and an Order of Conditions (on August 18, 2008) from the Burlington Conservation Commission.

Because the Proponent is not seeking financial assistance from the Commonwealth for the project, MEPA jurisdiction is limited to those aspects of the project that may cause Damage to the Environment as defined in the MEPA regulations and that are within the subject matter of required or potentially required state permits. In this case, MEPA jurisdiction extends to transportation, wastewater, wetlands and stormwater.

Project Changes Since the Filing of the Expanded Environmental Notification Form

Since the Expanded Environmental Notification Form (EENF) was reviewed, there have been some minor changes to the project. While the overall scale of the development has not changed since the EENF, the Proponent has incorporated modifications to address issues raised during the EENF review. These changes include building layout, stormwater management and transportation improvements.

Building Layout

The original Project design consisted of two office buildings in a mostly north-south orientation. During early consultations, the MEPA Office suggested the Proponent consider an alternate building orientation; rotating the buildings to a more east-west direction that would allow for greater daylighting and energy efficiency. In addition to the two-building plan, the EENF contained the conceptual evaluation of an alternate three building plan with two of the buildings oriented in an east-west direction. Also in addition to improved daylighting and energy-efficiency, the three-building plan also enhances the fit of the built space on the topography of the site by reducing the earthwork required and using the buildings to traverse the steeper slopes on-site. This orientation reduces required excavation and potential impact to

contaminated soils on-site. As a result of the improved fit and efficiency of the three-building plan, this plan has been advanced and permitted by the Town of Burlington and is presented as the Preferred Alternative in the Single EIR. The Proponent has also committed to a further reduction in greenhouse gas (GHG) emissions through a commitment to achieve a 14 percent reduction in energy consumption in the proposed buildings.

Stormwater Management

Due to the contaminated soils on-site from the activities of prior owners, very little infiltration of stormwater was proposed as part of this project so as to not exacerbate contamination issues or interfere with remediation efforts. However, during the review of the Notice of Intent, the Town of Burlington Conservation Commission requested that the Proponent consider additional on-site infiltration to reduce off-site flow further below existing levels to help alleviate downstream flow concerns. To address the Town of Burlington Conservation Commission's request, an area at the southwesterly corner of the site, outside of the contaminated groundwater contributory area, has been modified to serve as a detention and infiltration basin. This area helps address the Conservation Commission's goal of increasing on-site infiltration and further reducing runoff from the property.

Transportation Improvements

During the review of the Expanded ENF, MassHighway identified several areas of potential overlap and conflict with the Project's proposed traffic mitigation measures and that of another nearby project, Northwest Park (EEA # 14000). The overlap occurred mostly at the intersection of Middlesex Turnpike and the I-95/Route 128 Northbound ramps. As a result, several modifications and clarifications to the transportation mitigation package associated with this Project were made under alternate scenarios in which alternate Northwest Park project is constructed or does not move forward.

Review of the Single EIR

The Single EIR included a description of the project, a summary of changes since the filing of the EENF and a list of permits, and approvals, and project phasing. The Single EIR also provides an adequate description and analysis of the project and its alternatives, provides a detailed baseline of environmental conditions, and demonstrates that the project will incorporate all feasible means to avoid potential environmental impacts.

Traffic

The project is expected to generate approximately 4,530 net new average daily trips (adt) for a total of 7,020 vehicle trips. The Proponent prepared and presented a Traffic Impact and Access Study (TIAS) in accordance with Executive Office of Energy & Environmental Affairs (EEA)/Executive Office of Transportation and Public Works (EOTPW) guidelines during the review of the EENF. The Proponent conducted an evaluation of traffic flows and roadway capacity within the TIAS study area under the Existing, No-Build and Build conditions at nearby signalized and unsignalized intersections to determine the impact of the project on the area roadway system. The study included as background several projects that are expected to impact traffic operations within the study area. In particular, Northwest Park (EEA# 14000), an

approximately 3.6 million-square foot mixed-use development that recently completed MEPA review, is expected to significantly affect traffic operations at the I-95 /Route 128 /Middlesex Turnpike interchange and along the Middlesex Turnpike corridor. The analysis revealed that the Burlington Research Center project is not expected to result in an overall change in Levels of Service (LOS) at signalized intersections in the project area.

During the review of the EENF MassHighway requested details on the mitigation commitments and implementation which include mitigation for this project both with and without the implementation of the Northwest Park project. The Single EIR provided the detailed commitments to implement mitigation measures for this project under either scenario.

The proponent has committed to a comprehensive mitigation package that is consistent with the Northwest Park project's development program and its implementation schedule for mitigation. These mitigation measures generally consist of geometric and traffic signalization improvements at the Route 128/I-95/Middlesex Turnpike interchange to address the full build impacts of both projects. I strongly encourage the Proponent to continue to work with the Town of Burlington, the Metropolitan Area Planning Counsel and residents to ensure that traffic impacts associated with the project are appropriately mitigated.

The traffic improvements are proposed to be implemented under two scenarios. The first scenario addresses mitigation requirements if the Project is constructed after Phase I of the roadway improvements to be implemented by the Northwest Park project. As mitigation, the Burlington Research Center proponent would complete the improvements at the I-95 southbound ramp/Middlesex Turnpike intersection as identified in the Final EIR for the Northwest Park project prior to site occupancy. The second scenario addresses mitigation requirements if the Project proceeds before the Northwest Park project. In that case, the Burlington Research Center proponent would implement the improvements outlined in the Phase 2 improvement schedule provided in the Single EIR.

Transportation Demand Management

The Single EIR also included a comprehensive Transportation Demand Management (TDM) program that addresses and supports multimodal transportation in the vicinity of the project. The Proponent has committed to implement strategies related to improving intersection capacity, traffic safety, traffic flow and progression as well as developing a TDM Plan in an effort to reduce project-generated vehicle trips and to minimize peak period traffic demands in the study area. The Proponent will:

- Continue to work with the MBTA and the Town of Burlington B-Line to identify an appropriate location for bus stops near and/or on the site and associated amenities;
- Provide incentives for bicycle use, including a new shared-use bike/pedestrian path that would link to a planned path on an adjacent property, covered/secured bicycle storage, showers, and changing facilities/locker rooms;
- Provide parking to meet, but not exceed, local requirements (proposed 3.57 spaces/1,000 square feet of gross floor area for peak office times versus the local requirement of 4 spaces/1,000 square feet);

- Minimize parking supply through a shared parking approach where the office parking peak times are typically 9AM – 5PM and restaurants/retail uses have extended hours when the office parking could be utilized;
- Delineate a percentage of preferential carpool and vanpool parking spaces near office building entrances as an incentive for ridesharing;
- Delineate a percentage of preferential parking spaces for hybrid and/or alternative-fueled vehicles near office building entrances as an incentive to use clean-fueled vehicles;
- Provide on-site amenities (restaurant, convenience retail) to reduce off-site vehicle trips throughout the day; and
- Establish an on-site coordinator to administer the TDM program;

The Single EIR states that on-site employers will also be encouraged to implement appropriate TDM measures. Potential tenant-based TDM measures include:

- Providing flexible hours so that employees have the option of commuting outside the peak traffic periods. Similar benefits can also be realized through staggered work hours so that employee trips occur over a broader period and thereby reduce peak hour demands;
- Allowing Massachusetts employees to use pre-tax dollars (from both federal and state income and payroll taxes) for the purchase of MBTA transit passes;
- Holding promotional events for cyclists and pedestrians;
- Providing incentives for bicycle and hybrid vehicle commuting;
- Offering direct deposit to employees;
- Providing a guaranteed ride home program to eliminate an often-cited deterrent to carpool and vanpool participation;
- Sponsoring vanpools and subsidizing expenses; and
- Providing subsidies to employees who purchase monthly or multiple trip transit passes.

I strongly encourage the Proponent to join the Transportation Management Association (TMA) that serves the project area.

Greenhouse Gas Emissions

The Single EIR included an expanded Greenhouse Gas (GHG) Emissions analysis in response to the Certificate on the EENF and in accordance with the EEA Greenhouse Gas Emissions Policy and Protocol. Additionally, during the Single EIR comment period, the Proponent submitted additional information clarifying the analysis presented in the Single EIR. The Proponent calculated GHG emissions from both the project's mobile and stationary sources. The GHG emissions analysis evaluated the increase in carbon dioxide (CO_2) emissions resulting from project-related traffic and proposed building sources. The Single EIR also outlined a list of LEED (Leadership in Energy and Environmental Design) measures and a list of sustainable design elements that will be incorporated into the project.

Reductions in GHG emissions will be achieved through implementation of transportation demand management (TDM) measures, intersection improvements, and building design and operations improvements. The proponent has committed to reducing stationary source GHG emissions by a minimum of 14 percent through building orientation, interior daylighting, sky-

lights, motion-sensor activated lighting and climate controls, high-albedo roofing materials, window glazing, wall insulation, high-efficiency HVAC systems, and pre-occupancy building testing and commissioning. In addition, the Proponent has committed to work with tenants to implement energy efficient designs, materials, equipment, and operations throughout the development. The specific measures are detailed in the section on Mitigation and Section 61 Findings below.

The Single EIR also notes that the project will be designed to be compliant with the Massachusetts State Building Code, and as design progresses and tenants are identified, the Proponent will work to evaluate and encourage the incorporation of energy efficient building systems. The Proponent is reminded that the recently passed Green Communities Act (Chapter 169 of the Acts of 2008) requires that the International Energy Conservation Building Code be adopted and fully integrated into the State Building Code. Therefore, the Proponent should note that the Massachusetts requirements will be changing, and the new code may apply to buildings constructed as part of this project.

The Single EIR provided an analysis of GHG emissions using the EQUEST model to assess the direct and indirect stationary sources of CO_2 and the MOBILE6.2 model to assess transportation mobile sources. Under the Build with Improvements Conditions (2012) the project is estimated to generate 182,728.4 tons per year (tpy) of CO_2 compared to the Build Condition, base case estimate of 183,300.6 tpy CO_2, a difference of 572.2 tons per year. This represents a reduction in direct and indirect stationary emissions of 14 percent. This difference also includes a transportation related emissions reduction of 0.05 percent for the preferred alternative, when compared with the base case under the build condition.

The Single EIR stated that solar photovoltaic (PV) systems are not being included in the project's mitigation commitments even though the proponent was asked to consider PV in the Certficate on the EENF. At a minimum, with the cost of solar PV projected to only decrease in the future, the building should be designed and constructed to be solar-ready, with the HVAC and other roof-based systems located and consolidated on the north facing side and the roof strong enough to support the additional load of 5 – 10 pounds per square foot to facilitate future installation of a PV system. The Massachusetts Department of Energy Resources (DOER) and MassDEP recommend the Proponent consider PV systems through power purchase agreements with third party owners to reduce their electricity costs. The Proponent should consider constructing the facility accounting for the added weight of PV systems so that they may be installed in the future based upon tenant needs.

Although the main sources of GHG, from this project are associated with building heating and cooling, lighting, and vehiclular travel, the energy required to provide potable water and treat wastewater also will be a source of GHG emissions, in particular CO_2. The proponent and future tenants requiring pre-treatment for wastewater should consider energy efficiency when selecting wastewater processing methods and equipment to ensure that the 14 percent GHG reduction promised is realized.

Upon completion of construction, the Proponent should provide a certification to the MEPA Office signed by an appropriate professional (e.g., engineer, architect, general contractor)

indicating that the all of the mitigation measures referenced in below (or equivalent measures that collectively will reduce stationary source and mobile GHG Emissions as indicated in the Single EIR) have been incorporated into the project. The certification should be supported by as-built plans. For those measures that are operational in nature (i.e. TDM, recycling) the Proponent should provide an updated plan identifying the measures, the schedule for implementation and how progress towards achieving the measures will be obtained. MassHighway should incorporate this self-certification requirement into its Section 61 finding for this project.

Sustainable Project Site Design and Planning

The Single EIR describes the following sustainable design measures in the site design of the project. The Proponent will:

- Reduce overall impervious surface area (by almost one acre);
- Minimize the disturbance of currently undisturbed land;
- Avoid and minimize impacts to nearby natural resource areas;
- Coordinate the ongoing remediation of contaminated land with the responsible party;
- Minimize potable water demand through the use of water-efficient plumbing fixtures and stormwater reuse/drought-tolerant planting types for irrigation purposes;
- Incorporate an east/west building orientation for two of the three office buildings to maximize energy efficiency measures;
- Accommodate alternative transportation facilities (i.e., pedestrian and bicycle network);
- Implement transportation demand management initiatives in order to reduce single-occupancy vehicle trips;
- Implement physical and operational traffic mitigation measures in an effort to minimize the traffic congestion and air emissions; and
- Design exterior lighting to minimize both energy consumption and light pollution.

The Proponent has committed to the following building design and systems improvements in the core and shell of the buildings listed below. The Proponent will:

- Maximize window design to take full advantage of daylighting (the currently proposed project);
- Install light-colored reflective roofing materials to reduce 'heat island effect':
- Use hydrochlorofluorocarbon (HCFC) free roof insulation;
- Minimize the number of exterior lighting fixtures to reduce energy demand while utilizing directed fixtures to reduce light spill over off-site;
- Utilize regional manufacturers to the maximum extent feasible;
- Prohibit the use of high volatile organic compounds (VOCs) paint;
- Utilize low-VOC carpet adhesives;
- Provide adequate space for the outfit of recycling storage and ensure that the recycling program can accommodate paper, plastic, glass and aluminum at a minimum;
- Install high-efficiency, programmable and controllable HVAC systems;
- Prohibit the use of CFC-based refrigerants;
- High performance glazing to balance and optimize daylighting, heat loss and solar heat gain performance in all Project buildings;
- Use of HCFC-free wall insulation; and

- Provide daylight dimming sensors and occupancy sensors.

I acknowledge the difficulty in confirming the amount of GHG reductions possible in buildings whose tenants and uses are unknown at the time of MEPA review. However, I share MassDEP's concern that the Proponent's efforts to encourage future tenants to adopt additional GHG mitigation measures may or may not result in tangible GHG reductions. I note that the Proponent has committed to work with all future tenants to identify and implement similar feasible measures within the specific users' space.

Stormwater

The proposed project will be located primarily on previously paved and/or otherwise disturbed land. The majority of the site is covered by the existing buildings and parking field. The project will result in a decrease in impervious surface of approximately 0.44 acres. I note that infiltration of runoff is not proposed on this contaminated brownfield site in order to minimize the potential for stormwater mobilization of the contaminant plume in soil and groundwater.

Stormwater runoff impacts during construction and post-construction were evaluated in the Single EIR. The Single EIR attempted to demonstrate that source controls, pollution prevention measures, erosion and sediment controls, and the post-development drainage system will be designed in compliance with the MassDEP Stormwater Management Policy (SMP) andregulations. The Proponent has committed to:

- Enhancing stormwater management and improve water quality; and
- Minimizing potable water demand through the use of water-efficient plumbing fixtures and stormwater reuse/drought-tolerant planting types for irrigation purposes.

In its comments, MassDEP has stated that in reviewing the Single EIR for conformance with the remaining, applicable stormwater management performance standards, it appears that the stormwater management system could be designed for greater conformance with the Stormwater Management performance standards. I encourage the proponent to consider and incorporate MassDEP's detailed comments pertaining to each of the Stormwater management performance standards.

Groundwater and Massachusetts Contingency Plan

The Single EIR reiterates that there are several contaminated areas on-site that are subject to the Massachusetts Contingency Plan (MCP). Groundwater at the site has been contaminated with trichloroethylene (TCE) and tetrachloroethene (PCE) as a result of historical manufacturing operations. A groundwater extraction and treatment system is located at Building 25 and has been in operation since 1986, and includes five extraction wells. The groundwater extraction and treatment system is designed to maintain hydraulic control of the overburden and shallow bedrock plume on the northern side of the property. The project site is within portions of the Zone II and the Zone III upland recharge area for the Town of Burlington's seven municipal wells located in the Vine Brook Aquifer.

The Single EIR has outlined the plan for redevelopment of the project site simultaneously with ongoing and future site remediation activities that are being undertaken by Tyco Electronics, Inc. (Tyco) the responsible party for cleanup. Demolition of Building No. 1 will allow access to a suspected primary source of contamination. Redevelopment work is being planned to accommodate remedial activities. In addition, the proponent has committed to pre-characterize soils in the areas proposed for construction, and include these results in a Release Abatement Measure (RAM) plan that will be coordinated with Tyco and the Town of Burlington Board of Health. As described in the Single EIR, the semi-annual monitoring program for surface and groundwater should be sufficient to monitor contaminant transport during site redevelopment.

Wetlands

According to the Single EIR, the project will alter about 1,795 square feet of a basin which is determined to be Land Subject to Flooding and Inundation, a resource area covered by the Town of Burlington's wetland bylaws. The wetland resource areas to be impacted also includes an intermittent stream, a hydraulic connection between wetlands which will be relocated, and the buffer zone of several Bordering Vegetated Wetlands where impervious pavement is proposed. The Burlington Conservation Commission issued an Order of Resource Area Delineation for the project on June 15, 2007, and an Order of Conditions for the project on August 18, 2008.

Water and Wastewater

The project is expected to use approximately 154,000 gallons per day (gpd) of water and to generate approximately 140,000 gpd of wastewater. I note that the Town of Burlington is subject to a MassDEP Administrative Consent Order (ACO) that requires a 4:1 removal rate for each new project to be connected to the Town's wastewater system. The Town of Burlington has imposed an increase to the requirement by a gallon, for a total requirement for I/I removal of 5:1. The Proponent will also contribute $20,000 dollars for a water quality analysis of the wastewater system.

The project requires a new Industrial Wastewater Sewer Connection Permit from the MWRA. Therefore, the basis for determining pre-project flows cannot be the revoked Industrial Wastewater Sewer Connection Permit allowance. Instead, pre-project flows should be determined from the recent historical wastewater discharge records. Therefore, I strongly encourage the proponent to consult with the MWRA's Toxic Reduction and Control Department (TRAC) which maintains copies of these records.

While the Town of Burlington's sewer system may have adequate capacity to accommodate project flows during dry weather, it is subject to much higher flows during wet weather due to infiltration. To ensure that increased wastewater flows do not exacerbate surcharging and sanitary sewer overflows, the proponent has committed to comply with the Town of Burlington's I/I requirements at a ratio of five gallons of I/I to be removed for every gallon increase in sanitary flow beyond the revoked permit of 140,000 gpd. The proponent must provide updated calculations of pre-project flows, flows from the project once uses are defined,

and the amount of I/I offset to comply with the Town of Burlington's requirements for any future discharge permit.

I note that any use that will occupy the Burlington Research Center and propose to introduce industrial and/or laboratory wastewater into the MWRA sanitary sewer system must obtain a MWRA Sewer Use Discharge Permit. In addition, each occupant of the Burlington Research Center requiring a MWRA discharge permit must have its own accessible sampling discharge point prior to mixing with any other wastewater streams.

I commend the proponent for committing to rainwater harvesting (RWH) to help reduce potable water demand. As LEED certification allows up to seven points for RWH systems, including a point each for reducing water savings by 20, 30, and 40 percent, there is an added incentive to enhance the RWH system to garner as many points as practicable. Rainwater harvesting systems are being used as a source of water for toilets, urinals, water features, cooling towers, and secondary fire suppression.

Construction Period Impacts

The Single EIR included a discussion of construction phasing, evaluated potential impacts associated with construction activities, and proposed feasible measures to avoid or minimize impacts. The proponent should make every effort to recycle or reuse construction and demolition materials. Specifically, the Proponent should commit to developing a construction waste management plan that fully complies with the Massachusetts Waste Bans and establishes a minimum reuse/recycling goal of 50 percent.

Mitigation and Draft Section 61 Findings

The Single EIR included a separate chapter on mitigation measures that included draft Section 61 Findings. The draft Section 61 Findings contained clear commitments to implement mitigation measures, an estimate of the individual costs of each proposed mitigation measure, and identified the parties responsible for implementation. The Proponent has committed to the following mitigation measures below. The Proponent will:

- Utilize smart growth principles in the Site's redesign described in detail in the *Sustainable Project Site Design and Planning* section of this certificate;
- Provide significant environmental benefits over the existing condition by expediting remediation, upgrading stormwater management facilities, improving traffic circulation, and replacing outdated buildings with modern amenities and sustainable development elements (including a LEED-equivalent high performance building);
- Provide for up to $1.1 million in transportation improvements;
- Provide direct monetary contributions for infrastructure improvements and studies including: $500,000 towards additional off-site roadway and pedestrian improvements; $40,000 to fund a long-term regional transportation study that will be designed and conducted by MassHighway; and $20,000 for a water consumption and sewer system capacity analysis for the Town of Burlington;
- Provide over five acres open and/or landscaped space with a Conservation Restriction on

the land; and

- Implement a comprehensive Transportation Demand Management (TDM) plan, a new shared walking/bicycle path and, potentially, an on-site transit stop within the Project Site as well as a donation of $25,000 to the local Burlington B-Line bus.

I note that these Section 61 findings must be expanded to include GHG mitigation measures in accordance with the GHG Policy. The final Section 61 findings will be included with all state permits issued for this project, and will be considered binding upon the proponent as mitigation commitments. In accordance with Section 11.12 (5) (e) of the MEPA regulations, final Section 61 findings must be forwarded by each permitting agency to the MEPA Office, which will publish a Notice of Availability in the Environmental Monitor.

Conclusion

I find the Single EIR to be adequate and am allowing the project to proceed to the state agencies for permitting. The Single EIR contained adequate information on project impacts and mitigation, and provided the state permitting agencies with sufficient information to understand the environmental consequences of their permitting decisions. No further MEPA review is required.

November 28, 2008
Date

for Ian A. Bowles

Comments received:

11/21/08	Department of Environmental Protection, Northeast Regional Office
11/21/08	Stephen H. Kaiser, PhD
11/21/08	Massachusetts Water Resources Authority
11/21/08	Executive Office of Transportation, MassHighway
11/24/08	Metropolitan Area Planning Council
11/24/08	Proponent's Response to Dr. Stephen H. Kaiser's Comment Letter
11/24/08	Stephen H. Kaiser, PhD, 2nd comment letter

IAB/ACC/acc

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
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DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

November 21, 2008

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Burlington
Burlington Research Center, formerly 43/63
South Avenue Redevelopment
EEA # 14173

Attn: MEPA Unit

Dear Secretary Bowles:

The Massachusetts Department of Environmental Protection (MassDEP)) in collaboration with the Department of Energy Resources in the Executive Office of Energy and Environmental Affairs (DOER) have reviewed the Single Environmental Impact Report (SEIR) submitted by the Gutierrez Company to demolish the three existing buildings in order to construct office, research and development, retail, and restaurant space totaling 610,000 square feet in three new buildings on a 16 acre site in Burlington (EEA #14173). Parking for about 2,180 vehicles is proposed, 1,700 spaces will be within a parking garage. The Department provides the following comments.

Wastewater

The SEIR explains that the proposed wastewater flow from the project would not exceed existing permitted flow of 140,000 gallons per day, even though the project is increasing in size from 225,000 square feet of office/R&D space to 610,000 square feet, by adding 590,000 square feet of office/R&D space, 10,000 square feet of retail and 10,000 square feet of restaurant space. Wastewater from the project in excess of the flow permitted would require infiltration and inflow removal, which is acknowledged in the SEIR. The proponent also is contributing $20,000 dollars for a water quality analysis of the wastewater system.

Wetlands

An Order of Conditions was issued for the project on August 18, 2008 DEP File #122-0439 (page 5-12). The project would alter about 1,795 square feet of bordering land subject to flooding, the intermittent stream, hydraulic connection between wetlands A and E will be relocated, and impervious pavement is proposed within the buffer zone of several bordering vegetated wetlands

Stormwater

Infiltration of runoff is not proposed on the previously contaminated brownfield site in order to minimize the potential for stormwater mobilization of the contaminant plume in soil and groundwater. In reviewing the SEIR for conformance with the remaining, applicable stormwater management performance standards, however, it appears that the stormwater management system could be designed for greater conformance with the Stormwater Management performance standards in the Stormwater Management regulations, as detailed in the Stormwater Management Handbooks. Even though the proponent has received an Order of Conditions for wetlands and stormwater controls, MassDEP recommends that the proponent address these issues to the greatest extent feasible for this redevelopment site because stormwater discharges within the recharge area of the town's public water supply and toward Vine Brook (8349275), an impaired waterbody for which a total maximum daily load (TMDL) has been prepared for pathogens in the water.

1. *Standard 4* – Since a TMDL for Vine Brook has been completed, compliance with the total suspended solids (TSS) requires that BMPs be selected to address the impairment evaluated in the TMDL (Stormwater Management Handbook, Volume 1, Chapter 1, page 10. The best management practices proposed, i.e., catch basins and Stormceptor units are not designed to reduce pathogens.

2. *Standard 4 and Standard 6* – Although the stormwater management system may be designed to capture and treat one inch of runoff multiplied by the impervious area, this cannot be confirmed from a review of the SEIR. Water quality volume calculations or information on stormwater system sizing to show the volume of stormwater that would be treated were not found in the report.

3. *Standard 4* – Only a single TSS calculation is provided in Appendix C, but the SEIR indicates that drainage is discharged toward wetlands C/D in the southwest corner and towards wetland E, northeast of the site. Thus, calculations are needed for each discharge point to demonstrate compliance with the TSS removal standard, as noted on the calculation form.

4. *Standard* 4 – It was not possible to confirm that the TSS removal credit for the Stormceptor particle separator is appropriate, because no information on the size or design of the Stormceptor was found in the SEIR. Since the SEIR references the TARP evaluation of Stormceptor units and provides a copy of the Stormceptor factsheet, it is presumed that the project is not using a Stormceptor 450i, which was not evaluated, nor has that insert unit been deemed appropriate for use in LUPPLs or critical areas.

5. *Standard 4* - For compliance with Standard 4, a long term pollution prevention plan is required; however, none was included in the SEIR and the *Checklist for Stormwater Report* (Appendix C) does not indicate that a plan was included with the Notice of Intent submittal.

6. *Standard 5* - The SEIR indicated that the site would be a land uses with higher potential pollutant loads (LUHPPLs) because the project would attract more than 1,000 vehicle

trips per day. In addition, because the project site is defined as disposal site, under M.G.L. c. 21E, the project site would be considered a LUHPPL. Disposal sites as defined in 21E are subject to the LUHPPL Standard 5, as described in the SMH, Volume 1, Chapter 1, page 12.

7. *Standard 6* - The SEIR has not confirmed that the stormwater system discharging within the public water supply recharge area would be designed with emergency shutoff capabilities in the event of an accidental spill or incident.

8. *Standard 8* - The best management practices (BMPs) selected for erosion and sedimentation control were adopted from the MassDEP, 1993 Megamanual. However, the Clean Water Toolkit updated the Megamanual in 2006, so the proponent should utilize the toolkit for guidance on BMPs; it is available on the following website: http://projects.geosyntec.com/NPSManual/. The proponent plans to submit the stormwater pollution prevention plan (SWPPP) for construction activities to the conservation commission at a later date, as noted in the checklist.

9. *Standard 10* – An Illicit Discharge Compliance Statement is required for compliance with this standard.

Massachusetts Contingency Plan/21E

The SEIR has outlined the plan for redevelopment of the project site during ongoing and future site remediation activities which are being undertaken by Tyco Electronics, Inc. (Tyco). Demolition of Building No. 1 as part of this project, will allow access to a suspected primary source of contamination. Redevelopment work is being planned to accommodate remedial activities. In addition, the proponent will pre-characterize soils in the areas proposed for construction, and include the results of in a construction-related Release Abatement Measure (RAM) plan that will be coordinated with Tyco and the town of Burlington board of health. As described in the SEIR, the current semi-annual monitoring program for surface and groundwater is considered to be sufficient to monitor contaminant transport during redevelopment of the project site.

Greenhouse Gas (GHG) Analysis

The SEIR has provided an analysis of greenhouse gas emissions, using the EQUEST model to assess the direct and indirect stationary sources of CO_2 and MOBILE6.2 for transportation sources. The EQUEST runs were provided only for the baseline design and 2012 build, which made it infeasible to compare the data used for the build with improvements, alternative 1 and 2. The Build with Improvements for the full build out in 2012 is estimated to generate 182,728.4 tpy of CO_2 compared to the Build Condition, base case estimate of 183,300.6 tpy CO_2. The difference is 572.2 tons per year, which represents a reduction in the increase of direct and indirect stationary emissions by 14 percent and a transportation related emissions reduction of 0.05 percent for the preferred alternative, when compared with the base case, build condition.

The proponent has committed to reducing stationary source GHG emissions by a minimum of 14 percent with building orientation, interior daylighting, sky lighting, motion-sensor activated lighting and climate controls, high-albedo roofing materials, window glazing,

increased wall insulation, high efficiency HVAC systems, and pre-occupancy building testing and commissioning. In addition, there is a commitment to work with tenants to fit-out the office, retail, and restaurant buildings with energy efficient designs, materials, equipment, and operations. The Department recommends that both these commitments be referenced as required mitigation measures in the Secretary's Certificate.

The project proponent was asked to consider PV, but no mention was made of PV in the SEIR. At a minimum, with the cost of solar PV projected to only decrease in the future, the building should be designed and constructed to be solar-ready, with the HVAC and other roof-based systems located and consolidated on the north facing side and the roof strong enough to support the additional load of 5 – 10 lbs/sq-ft to facilitate future installation of a PV system. DOER and MassDEP recommend that along with the other green initiatives the developer plans to encourage the tenants to adopt, that included should be the consideration of PV through power purchase agreements with 3rd party owners to reduce their electricity costs. Detailed information on such arrangements is available through the Mass Renewable Energy Trust at the Massachusetts Technology Collaborative.

MassDEP acknowledges the efforts by the project proponent to reduce the emissions impacts of the vehicles projected to travel to the project in the 2012 Build Year. However, MassDEP reiterates the importance of pursuing as many transportation demand management (TDM) measures as possible to reduce vehicle trips. One such measure the project proponent can still take advantage of is joining the Transportation Management Association (TMA) that serves the project area. As noted in the Expanded Environmental Notification Form (EENF), TMAs are fee-based organizations that help local employers develop and implement TDMs to reduce trips to the worksite. In Burlington, the TMA is the 128 Business Council, which can be reached at 781-890-0093 or 128bcv@128bc.org.

The Department commends the proponent for proposing rainwater harvesting (RWH) to help reduce potable water demand. How will the system be sized in proportion to the available rooftop areas, and will all irrigation needs be met or exceeded with rainwater? As LEED certification allows up to seven points for rainwater harvesting systems, including a point each for reducing water savings by 20, 30, and 40 percent, there is an added incentive to enhance the RWH system to garner as many points as practicable. Rainwater harvesting systems also are being used as a source of water for toilets, urinals, water features, cooling towers, and secondary fire suppression. The Department recommends reconsideration of the rainwater collection system, as the project is phased in, and particularly if the project attracts a tenant with high water demand.

Although the main sources of GHG, from this project are associated with building heating and cooling, lighting, and vehicle travel, the energy required to provide potable water and treat wastewater also will be a source of GHG, and in particular CO_2. The proponent and future tenants requiring pre-treatment for wastewater need to consider energy efficiency when selecting wastewater processing and equipment to ensure that the 14 percent GHG reductions promised are realized.

In addition the low-flow fixtures and equipment that will be installed to reduce water demand should be reviewed for consistency with the USEPA's WaterSense website at

http://www.epa.gov/owm/water-efficiency/, to ensure that at least 20 percent savings would be achieved with the plumbing fixtures and equipment selected. To achieve water and energy savings goals, consideration also should be given to using HVAC equipment with advanced evaporator coils, which have been reported to reduce water loss by about 50 percent and energy demand by up to 25 percent.[1] Other mitigation measures appropriate for reducing energy use for water and wastewater are water distribution system improvements to eliminate un-accounted for water losses and infiltration and inflow (I/I) removal from sewer mains, which also is required to offset wastewater generated by the project which has the potential to increase sewer and combined sewer overflows.

Recycling and Materials Management

The SEIR mentions the potential for demolition waste recycling without a clear commitment, and does not acknowledge the importance of advancing and promoting materials management for the Burlington Research Center project for GHG emissions reductions with future tenants.

During the **design phase**, MassDEP requests the proponent address waste reduction, environmentally preferable materials use, and the need to design for the storage and collection of recyclables. In order to plan for waste reduction, the proponent should consider implementing a waste prevention purchasing policy, which may include management options for reducing shipping and packaging materials and if necessary, managing excess materials through unused product return or donation.

During the **construction phase**, MassDEP recommends that the proponent's material management efforts focus on material reuse and recycling. The proponent should commit to developing a construction waste management plan that fully complies with the Massachusetts Waste Bans and establishes a minimum reuse/recycling goal of 50 percent. The Department has demonstrated through pilot construction projects that this planning results in significant reductions in waste and cost savings for developers. Information and resources to assist in the development and implementation of a construction management plan can be found at http://www.mass.gov/dep/recycle/reduce/managing.htm#project.

In the **operations phase,** tenants also should develop waste management plans to ensure compliance with the MassDEP Waste Bans. The Department offers resources to assist in this area including planning tools, contracting language, and lists of service providers (http://www.mass.gov/dep/recycle/reduce/assistan.htm#reduce). As mentioned for construction, waste management plans should establish a target-recycling goal of more than 50 percent. This level of recycling has been achieved consistently with demonstrated operational cost savings and capital asset appreciation benefits. Waste recycling storage areas should be sufficient to manage waste materials currently prohibited from disposal in Massachusetts. A list of these materials can be found on the MassDEP website: http://www.mass.gov/dep/recycle/solid/regs0201.htm.

[1] *Greener Pastures for America's Homebuilders?* Calvert Group, LTD. with collaboration from the Boston College Institute for Responsible Investment. March 2008.

Town of Burlington recycling program. Recycling within the office uses will be handled through the building maintenance and management agreements with the tenants. Building management will also provide tenants with the facilities and services necessary to recycle materials such as light bulbs, batteries, and paint cans. The recycling program will be conducted in accordance with the Town of Burlington's recycling regulations.

Greenhouse Gas Emissions Analysis

The Executive Office of Energy and Environmental Affairs (EEA) has recently developed and issued a policy that requires project proponents to identify and describe the feasible measures to minimize GHG emissions. The *MEPA Greenhouse Gas Emissions Policy and Protocol* requires that projects undergoing review by the MEPA Office at the EIR level and meeting specific criteria (e.g., generation of 3,000 or more vehicle trips per day) to quantify the Project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying project-related GHG emissions, the Policy also requires proponents to quantify the impact of proposed improvements in terms of emissions and energy savings. The goal of the Policy is to identify measures to reduce or minimize the GHG emissions. While GHG emissions include several gases, Carbon Dioxide (CO2) was selected for evaluation because it is the most significant component of project-related GHG emissions. EPA has not set National Ambient Air Quality Standards (NAAQS) for GHGs; however, they do encourage strategies to reduce emissions and save fuel.

As stated in the *Environmental Monitor*, the Policy will apply to ENFs and EENFs submitted after the June 30, 2008 submission deadline if the Project is subject to the Policy (the Expanded ENF for this Project was submitted in January 2008). The Secretary's MEPA Certificate on the Expanded ENF, dated March 28, 2008, requested that the Proponent respond to comments related to the GHG analysis, including comparing alternatives to the Project, clarify the applicable LEED elements and evaluate their potential GHG emission reductions, clarify modeling inputs and calculations, provide supporting documentation as well as expand on the package of proposed GHG-related Project improvements.

Summary of Mesoscale Analysis

Chapter 4a, *Ozone Mesoscale Analysis* of the Expanded ENF evaluated the change in emissions from Project-related traffic for the 2007 Existing, 2012 No-Build, and 2012 Build, and 2012 Build with Mitigation conditions. The 2007 Existing Condition was estimated to result in 380.5 kilograms per day (kg/day) of VOCs, and 985.9 kg/day of NOx. Under the 2012 No-Build Condition, VOC emissions were estimated to be 280.9 kg/day, and NOx emissions were estimated to be 594.2 kg/day. The No-Build Condition VOC and NOx emissions are lower than the

2007 Existing Conditions emissions due to the implementation of emission control programs, such as the Federal Motor Vehicle Emission Control Program, the Stage II Vapor Recovery System, and the Massachusetts Vehicle Inspection and Maintenance program.

Under the 2012 Build Condition, the VOC emissions were estimated to be 285.6 kg/day and the NOx emissions were estimated to be 600.5 kg/day. This results in an increase of 4.7 kg/day in VOC emissions and an increase of 6.3 kg/day in NOx emissions from the 2012 No-Build Condition. The analysis of Project-related impacts indicates that with the implementation of improvements, the additional Site-generated traffic associated with the Project will not have an adverse impact on the majority of intersection traffic operations. Additionally, the proposed TDM measures are expected to reduce the VOC and NOx emissions associated with the Project.

■

Mobile Source CO2 Analysis

The air quality study for the Project calculates GHG emissions from mobile sources.

Mobile Source Analysis Methodology

The mobile source emissions are calculated by performing a yearly mesoscale analysis to evaluate the changes in CO2 emissions for the existing and future conditions within the study area. The mesoscale analysis estimated the area wide CO2 emissions from vehicle traffic for a time period of one year. Similar to the mesoscale analysis for ozone, the future year of analysis was selected such that it is consistent with MEPA's policy, which requires that a project look five years into the future from the current year of analysis. The mesoscale analysis traffic (volumes, delays, and speeds) and emission factor data are developed for four conditions: 2007 Existing, 2012 No Build, 2012 Build, and 2012 Build with Mitigation. The GHG analysis calculated the changes in CO2 emissions due to the roadway mitigation measures and TDM program using the EPA's COMMUTER[2] model Version 2.

Mobile Source Emission Rates

Currently MOBILE6.2 has a simple estimate of CO2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts-specific conditions. A detailed presentation of the MOBILE6.2 input and output data are presented in Appendix B.

[2] COMMUTER, version 2.0 release from the U.S. Environmental Protection Agency

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mesoscale analysis for CO2 emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity.

Existing Mobile Source CO2 Emissions

The calculation of 2007 Existing Condition mobile source emissions provides a base for which future years can be evaluated. The mobile source analysis calculated the 2007 Existing Condition CO2 emissions from the major roadways in the study area. These emissions, estimated to be 148,204.6 tons/year, establish a baseline to which future emissions can be compared. Table 2-1 below presents the existing mobile source CO2 analysis results for the 2007 Existing Conditions.

Future Mobile Source CO2 Emissions

Future Project-related emission calculations are based upon changes in traffic and emission factor data as well as the Project's building sources. The traffic data include traffic volumes, vehicle-miles-of-travel, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds.

The mobile source analysis estimated the future study area CO2 emissions due to the changes in traffic and emission data. Under the 2012 No-Build Condition, CO2 emissions were estimated to be 176,496.2 tons per year (Table 2-1). The 2012 No-Build Condition CO2 emissions are greater than the 2007 Existing Condition CO2 emissions (by 28,291.6 tons per year) because the projected increase in traffic volumes in 2012 as compared to the existing traffic volumes due to growth within the study area (without the Project).

Under the 2012 Build Condition, the mobile source CO2 emissions were estimated to be 179,815.9 tons per year (Table 2-1). Under the 2012 Build Condition with Improvements, the mobile source CO2 emissions were estimated to be 179,731.6 tons per year (Table 2-1). This results in a decrease of 84.3 tons per year in mobile source CO2 emissions for a total of 179,731.6 tons per year mobile source emissions as compared to the 2012 Build Condition. This reduction is due to the proposed signal timing improvements of the study area roadways, TDM measures and operational measures (described below). This represents an approximately 0.05 percent reduction of the 178,815.9 tons per year (2012 Build Condition). The mobile source CO2 emissions percent reduction is calculated as follows:

Reduction % = Reductions Due to Project Improvements
2012 Build Condition

Therefore, the percent reduction in mobile source emissions due to Project-related improvements is: 84.3/ 179,815.9 = 0.00047 x 100 = 0.047% or 0.05% (Table 2-1). Specific details of these proposed improvements are discussed below in the 'Mobile Source-Related Improvements' section below. Table 2-1 below presents CO2 emissions from mobile sources under all conditions.

Table 2-1
Mobile Source CO2 Emissions (tons per year)

2007 Existing Condition	2012 No-Build Condition	2012 Build Condition	2012 Project Emissions	2012 Reductions Due to Project Improvements	2012 Build w/ Improvements Condition[1]	Percent Reduction of Project Improvements to Project Emissions
148,204.6	176,496.2	179,815.9	3319.7	84.3	179,731.6	0.05%

1 The proposed improvements are described in 'Mobile Source-Related Improvements' section below. Mobile source improvements include the proposed roadway/traffic improvements and TDM measures.

The GHG emissions analysis provided in this SEIR includes the quantification of the specific proposed TDM measures (outlined under the 'Mobile Source-Related Improvements' section below). As represented in Table 2-1 above, a total reduction of 84.3 tons per year of mobile source CO2 emissions, or a 0.05 percent reduction, would result under the 2012 Build with Improvements Condition. In fact, the mobile source emissions reductions due to improvements result in a 2.5 percent reduction of the Project Emissions.

Mobile Source-Related Improvements

The Proponent has committed to transportation-related improvements into the Project in order to reduce GHG emissions. The below-mentioned improvements evaluated in the GHG analysis are committed to by the Proponent meeting the intent of the *MEPA Greenhouse Gas Emissions Policy and Protocol.* Some additional operational improvements may be included in the Project as they will be encouraged with the future tenants (where noted). As discussed in the 'Sustainable Design Elements' section above, the Proponent does not control the business operations and tenants have not yet been identified.

As presented in Chapter 6, *Mitigation and Beneficial Measures*, the Proponent will implement strategies related to improving intersection capacity, traffic safety, traffic flow and progression as well as developing a Transportation Demand Management (TDM) Plan in an effort to reduce Project-generated vehicle trips and to minimize peak-period traffic demands in the study area. The implementation of the TDM Plan is expected to improve air quality in the study area by increasing the number of

persons in a vehicle, and promoting the use of alternative modes of travel. The Proponent has committed to the following TDM measures:

- The Proponent will continue to work with the MBTA and the Burlington B Line to identify an appropriate location for bus stops near and/or on the Site and other amenities.
- Provide incentives for bicycle, including a new shared-use path (bike/pedestrian facilities) that links up to a planned path on an adjacent property, covered/secured bicycle storage, showers, and changing facilities/locker rooms.
- Parking to meet, not exceed, PDD requirements (proposed 3.57 spaces/1,000 square feet of gross floor area for peak office times).
- Minimize parking supply through a shared parking approach where the office parking peak times are typically 9AM – 5PM and restaurants/retail have extended hours when the office parking could be utilized.
- Delineate a percentage of preferential carpool and vanpool parking within the parking garages and surface spaces near office building entrances as a convenience to promote ridesharing.
- Delineate a percentage of preferential parking for hybrid and/or alternative-fueled vehicles within the parking garages and surface spaces near office building entrances as a convenience to promote the use of clean-fueled vehicles.
- Provide on-site amenities (restaurant, ATM, convenience retail) to reduce off-site vehicle trips throughout the day.
- Establish a TDM coordinator will be appointed to oversee site-related transportation demand management.
  - The TDM coordinator will provide central commuter information centers within the site to assist employees.
  - The TDM coordinator will also post local bus and train schedules at central points within the lobbies of the buildings on the site.
- Provide signage for 'no-idling' truck zones/queuing areas.

Employers within the Project will also be encouraged to implement appropriate TDM measures. Because not every TDM measure will be suitable for every type of employer, it is not assumed that these measures will be implemented. Therefore, they were not quantified in the COMMUTER model for GHG emissions reductions, but should be considered as potential benefits to overall air quality. Potential tenant-based TDM measures include:

- Provide flexible hours so that employees have the option of commuting outside the peak traffic periods. Similar benefits can also be realized through staggered work hours so that employee trips occur over a broader period and thereby reduce peak hour demands.
- Allow Massachusetts' employees to use pre-tax dollars (from both federal and state income and payroll taxes) for the purchase of MBTA passes.
- Hold promotional events for bikers and walkers.
- Provide incentives for bicycle and HOV commuting.
- Offer direct deposit to employees.
- Provide a guaranteed ride home program to eliminate an often-cited deterrent to carpool and vanpool participation.

- Sponsor vanpools and subsidize expenses.
- Provide subsidies to employees who purchase monthly or multiple trip transit passes.

Stationary Source CO2 Analysis

The air quality study for the Project calculates GHG emissions from stationary sources.

Stationary Source Analysis Methodology

The direct and indirect CO2 emissions from the Project's proposed building sources were calculated using the computer-based EQUEST model[3]. Direct emissions include those emissions from the facility itself such as boilers, heaters, and internal combustion engines. Indirect emissions includes CO2 emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. The EQUEST model estimates the amount of energy consumed by each building from electricity and gas usage. Then the amount of consumed energy is converted into the amount of CO2 emitted using the standardized conversion factor.[4] In addition to the 2007 Existing and 2012 No-Build Conditions, the stationary source analysis calculates GHG emissions for two build alternatives:

- **2012 Build Condition:** The current site layout plan in the form of three office buildings plus the ancillary restaurant and retail buildings using typical construction materials and rooftop equipment that meet the minimum requirements of the MA Building Code.[5]
- **2012 Build with Improvements:** (1) The current site layout plan (two buildings re-orientated) using typical construction materials and rooftop equipment that meet the minimum requirements of the MA Building Code; and (2) the current site plan with an energy efficiency performance standard (a minimum 14 percent).

The 2012 Build with Improvements 2 condition would include a menu of building system and operational improvements, to be evaluated and confirmed as part of final design, aimed at achieving a minimum energy efficiency of 14 percent in accordance with LEED requirements, as committed to under the rezoning of the Site.

[3] EQUEST (the Quick Energy Simulation Tool), version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA

[4] 1107 lb CO2/MWh was used to convert electricity consumption into the amount of CO2 emissions (ISO-New England Marginal Emissions Report). 117.08 lb CO2/Mbtu was used to convert gas consumption into the amount of CO2 emissions (The Energy Information Administration Documentation for Emissions for GHG).

[5] Massachusetts Building Code 780 CMR, 6th Edition (2006).

Existing Stationary Source CO2 Emissions

The calculation of 2007 Existing Condition emissions provides a base for which future years can be evaluated. The GHG analysis calculated the 2007 Existing Condition CO2 emissions for direct and indirect emissions from the existing stationary sources. Currently, the existing buildings are estimated to emit 1,544.5 tons per year of CO2. It is assumed that the existing buildings continue to be operational using systems such as lighting and heating; therefore, contributing to the GHG emissions

Future Stationary Source CO2 Emissions

The Project's building sources included direct emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following section presents the findings of the stationary source (direct and indirect) analysis for the Project.

The Project would also generate GHG emissions through the use of electricity and fossil fuels. As described above under the 'Stationary Source Analysis Methodology' section, the stationary source GHG emissions analysis calculated the direct and indirect stationary source CO2 emissions for the future build conditions. Under the 2012 No-Build Condition, the stationary source CO2 emissions were estimated to be 1,544.5 tons per year (Table 2-2), which is the same as the 2007 Existing Condition because it is assumed that there would be no change in the on-site conditions (accounts for electricity use at the existing buildings).

Building Re-Orientation

The stationary source CO2 emissions for the 2012 Building Condition were estimated to be 3,484.7 tons per year (Table 2-2). Under the 2012 Build Condition with Improvement 1, the stationary source CO2 emissions were estimated to be 3,483.8 tons per year, which results in a decrease of 0.9 tons per year compared to the 3,484.7 tons per year for the 2012 Build Condition (Table 2-2), which represents an approximately 0.03 percent reduction. It is important to note that many factors can affect the amount of GHG benefit that re-orientation of a building can achieve. These factors include the amount of window space on each side of the building and the fact that the relationship of the original building orientation to a proposed building orientation may not be the worst-case to best case condition. The stationary source CO2 emissions percent reduction for Alternative 1 was calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{Reductions Due to Project Improvements}}{\textit{2012 Build Condition}}$$

Therefore, the percent reduction in stationary source emissions due to Project improvements for Alternative 1 is: 0.9/3,484.7 = 0.0003 x 100 = 0.03% (Table 2-2).

Energy Efficiency Performance Standard

The 2012 Build Condition, the CO2 emissions were estimated to be 3,484.7 tons per year (Table 2-2). Under the 2012 Build Condition with Improvements 2, the stationary source CO2 emissions were estimated to be 2,996.8 tons per year, which results in a decrease of 487.9 tons per year compared to the 2012 Build Condition (Table 2-2) and represents an approximately 14 percent reduction of the 3,484.7 tons per year 2012 Build Condition. The stationary source CO2 emissions percent reduction for 2012 Build Condition with Improvements 2 was calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{Reductions Due to Project Improvements}}{\textit{2012 Build Condition}}$$

Therefore, the percent reduction in stationary source emissions due to Project improvements for Alternative 2 is: 487.9/3,484.7 = 0.14 x 100 = 14% (Table 2-2).

Table 2-2
Stationary Source CO2 Emissions for Alternative 2: Energy Efficiency Performance Standard
(tons per year)

2007 Existing Condition	2012 No-Build Condition	2012 Build Condition[1]	2012 Project Emissions	2012 Reductions Due to Project Improvements (Alternative 2)[2]	2012 Build Condition w/ Improvements (Alternative 2)[2]	Percent Reduction of Project Improvements to Project Emissions
1,544.5	1,544.5	3,484.7	1,940.2	487.9	2,996.8	14%

1 Includes three office buildings plus the ancillary restaurant and retail buildings using typical construction materials and rooftop equipment that meet the minimum requirements of the MA Building Code

2 The current Project with an energy efficiency performance standard (a minimum 14 percent) in accordance with LEED requirements, as described in the 'Stationary Source-Related Improvements' section below.

The GHG emissions analysis provided in this SEIR presents the commitment to a reduced energy use of 14 percent including the quantification of the re-orientated buildings (discussed further in the 'Mobile Source-Related Improvements' section below). As represented in Table 2-2 above, a total reduction of 487.9 tons per year of stationary source CO2 emissions, or an approximately 14 percent reduction, would result under the 2012 Build with Improvements Condition. In fact, the stationary source emissions reductions due to improvements result in an approximately 25 percent reduction of the Project Emissions due to the elimination of the existing emissions from the existing buildings in operation.

The Proponent has committed to Project-design related improvements, where feasible at the current stage of design, into the Project in order to reduce GHG emissions. The below-mentioned improvements evaluated in the GHG analysis/model are committed to by the Proponent meeting the intent of the *MEPA Greenhouse Gas Emissions Policy and Protocol.* Some additional physical and operational improvements may be included in the Project as they will be encouraged with the future tenants. As discussed in the 'Sustainable Design Elements' section above, the Proponent does not control the business operations or fit-out of the buildings, which will be completed by the tenants as they are identified.

In response to the Secretary's Certificate, the Proponent evaluated additional GHG-related improvements, including the re-orientation of the buildings for improved solar gain for daylighting. Additionally, as discussed in the 'Sustainable Design Elements' section above, the mitigation commitments for the rezoning of the Site including a "LEED-certifiable", or high-performance buildings. By utilizing the U.S. Green Building's Green Building Rating System criteria and the LEED checklist, the Proponent will ensure a reduced energy demand for the buildings resulting in a lower amount of Project-related GHG emissions. In compliance with current LEED requirements, the Proponent is committed to ensuring that the buildings meet a minimum energy performance of 14 percent efficiency. It is anticipated that this will be achieved by some combination of the following measures:

Site and Architectural Design/Treatments

- Rotation of the proposed buildings in a north-south rotation in order to maximize daylighting and solar gain opportunities.
- Use of highly-reflective (high-albedo) roofing materials.
- Maximize interior daylighting through floor plates, increased building perimeter and use of skylights and light wells in public areas.
- Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance in all Project buildings.
- Use of increased insulation on exterior walls.

Building Systems

- Install high-efficiency HVAC systems on the basis of life-cycle cost analysis.
- Eliminate or reduce use of refrigerants in HVAC systems.
- Incorporate motion sensors and lighting and climate control in all public areas (indoor and outdoor).
- Use efficient, directed exterior lighting.
- Water-efficient plumbing fixtures.
- Full pre-occupancy building testing and commissioning.
- Incorporation of zoned HVAC systems.
- Installation of individual tenant metering.

During post-construction and pre-occupation, special care will be taken to assure that all systems are installed and function as designed, and commissioning requirements will be included in the specifications if appropriate.

■

Conclusion

The air quality study demonstrates that the Project complies with the Policy because, in an effort to reduce GHG emissions, the Proponent has evaluated different alternative site layout plans and quantified the estimated GHG emissions reductions, and has committed to a minimum energy efficiency performance standard as reasonable and feasible measures to avoid, minimize, or mitigate damage to the environment. The GHG emissions analysis herein demonstrates that the Project meets the intent of the Policy because it will result in reduced mobile and stationary source GHG emissions, as compared to the baseline condition.

For GHG File
14180

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3/18/08 (B)

March 14, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY & ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME:	North Adams Plaza Redevelopment
PROJECT MUNICIPALITY:	North Adams
PROJECT WATERSHED:	Hudson
EEA NUMBER:	14180
PROJECT PROPONENT:	North Adams Property Development, LLC
DATE NOTICED IN MONITOR:	February 6, 2008

Pursuant to the Massachusetts Environmental Policy Act (G.L. c. 30, ss. 61-62H) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of an Environmental Impact Report (EIR).

Project Description

As described in the Expanded Environmental Notification Form (EENF), the project involves the redevelopment of a vacant strip plaza on an approximately 13.4-acre parcel located on the west site of Route 8 across from the Robert Hardman Industrial Park in North Adams. The site has been underutilized for approximately a decade and vacant since 2006. An approximately 95,712 square foot (sf) structure that formerly housed a cinema and a mix of restaurant and retail uses remains as well as approximately 630 parking spaces. The redevelopment includes demolition of the existing structure and construction of an approximately 126,500 sf Lowe's home improvement store with an associated 28,630 sf garden center and an approximately 3,600 sf separate drive-through bank or retail facility on an out-parcel in the southeasterly corner of the site. Previously, a Home Improvement Store was proposed on a site north of the proposed site.

An EENF for that project was submitted to MEPA in July 2005 (EEA #13578). That project is no longer under consideration.

Jurisdiction

The project is undergoing environmental review and requires the preparation of an Environmental Impact Report pursuant to Section 11.03(6)(a)(6) of the MEPA regulations because it requires state permits and because the project will generate more than 3,000 new average daily trips on roadways providing access to a single location. The project requires a National Pollutant Discharge Elimination System (NPDES) General Construction Permit from the U.S. Environmental Protection Agency (EPA); a Highway Access Permit from the Massachusetts Highway Department (MassHighway); and an Order of Conditions (OOC) from the North Adams Conservation Commission (and therefore a Superceding Order of Conditions from the Department of Environmental Protection (MassDEP) if the local Order is appealed). The project is subject to the EEA Greenhouse Gas (GHG) Emissions Policy and Protocol. The Proponent has received a Special Permit from the North Adams Planning Board and a permit from the North Adams Zoning Board of appeals to reduce parking at the site to less than what is required under local zoning.

Because the Proponent is not seeking financial assistance from the Commonwealth for the project, MEPA jurisdiction is limited to those aspects of the project that may cause significant Damage to the Environment and that are within the subject matter of required or potentially required state permits. In this case, jurisdiction extends to transportation, wetlands and stormwater.

Request for a Single EIR

In accordance with Section 11.05(7) of the MEPA regulations, the Proponent has submitted an Expanded ENF (EENF) with a request that I allow the Proponent to fulfill its EIR obligations under MEPA with a Single EIR, rather than the usual process of a Draft and Final EIR. The EENF was subject to a 37-day review period pursuant to 301 CMR 11.05(7). The Proponent's request for a Single EIR was discussed at the MEPA site visit held for the project on February 29, 2008. Based on a review of the EENF, I hereby find that the document meets the regulatory requirements and I am permitting the Proponent to file a Single EIR in fulfillment of Section 11.03 of the MEPA regulations. The Proponent should prepare the Single EIR in response to the Scope outlined below.

SCOPE

General

The Single EIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope. The Single EIR should include a copy of this Certificate and

the comments submitted on the EENF. The Single EIR should include a thorough description of the project, including a detailed description of construction methods and phasing and any changes to the project since the filing of the EENF. The Single EIR should include a brief description of each state permit or agency action required or potentially required, and should demonstrate that the project will meet applicable performance standards. The Proponent should also provide an update on the local permitting process for the project.

Alternatives

In addition to the project presented in the EENF, the Proponent evaluated alternative site plan configurations during the project planning process including the No-Build alternative and the development alternative that would be allowed as-of-right at the site. The project site has remained underutilized for approximately a decade and vacant since the summer of 1996. The No-Build alternative would leave the site in its present deteriorated condition, and would not meet the Proponent's development objectives or contribute to economic development in the City of North Adams. The preliminary alternative consists of re-occupying the existing 97,000 sf retail building. While this alternative may result in slightly less traffic impacts, it would not result in any significant improvements to existing infrastructure and would result in greater water and wastewater impacts. In addition, the Proponent states that this alternative is not supported by market conditions.

The Proponent concludes in the EENF that the preferred alternative works best to meet the needs of the project while keeping resource area impacts minimal, providing significant improvements to on-site stormwater, wastewater and water supply infrastructure, and providing mitigation for project-related traffic. The preferred alternative may be carried forward to the Single EIR, subject to further modification as outlined in this Certificate below.

Stormwater

Development associated with the proposed project will be located on previously paved and/or otherwise disturbed land. The majority of the site is covered by the existing building and parking field. The site does not contain any stormwater Best Management Practices (BMP) under existing conditions. The project will result in an increase in impervious surface of 0.44 acres +/- at the site.

The EENF included a discussion of existing and proposed drainage conditions for the project and described the main elements of the proposed stormwater management system designed to control project-related stormwater runoff. Stormwater facilities will direct rooftop runoff through an independent closed pipe system directly to a detention basin at the north end of the site. Runoff from the remaining impervious areas will be collected in a closed drainage system by catch basins with 4-foot sumps and oil/debris traps. Prior to being discharged to the detention basin at the north end of the site, stormwater will be treated by water quality units to reduce total suspended solids (TSS). The project will not increase peak discharge rates in the post-development condition. The results of soil borings conducted at the site indicate that Low

Impact Development (LID) techniques using infiltration are not possible due to poor soils and the presence of a high water table. The EENF provided a discussion of how the proposed stormwater management system would comply with MassDEP's Stormwater Management Policy (SMP). In the Single EIR, the Proponent should update this discussion to reflect compliance with the revised SMP (February 2008).

The Proponent will implement a comprehensive source control program at the site which will include regular pavement sweeping, catch basin cleaning and enclosure and maintenance of all dumpsters, compactors and loading areas. No snow will be placed in or adjacent to wetland resource areas. A long term Operation and Maintenance Plan (O & M Plan) will be implemented to ensure that BMPs are maintained to function as designed. During construction activities, a Stormwater Pollution Prevention Plan will be prepared and implemented in accordance with EPA's NPDES General Permit. The EENF contained a Sedimentation and Erosion Control Plan that outlines measures that will be implemented to minimize and mitigate construction period impacts. The Proponent should ensure that hay bales are not used for erosion control as they may contain seeds from invasive species.

Wetlands

Three potential state regulated wetland systems are located on or adjacent to the project site, referred to in the EENF as Wetlands 1, 2 and 3. Resource areas associated with these systems include Bordering Vegetated Wetland (BVW) and Bank. The North Adams Conservation Commission issued a Determination of Applicability in July of 2007 stating that Wetland 3 is not subject to protection under the Wetlands Protection Act. Wetland 3 will be filled entirely as a result of the project, and 185 sf of BVW from Wetland 2 will be altered due to the proposed access to Route 8, construction of the parking lot, detention basin and associated grading. Work is also proposed within the 100-foot buffer zone to wetland resource areas. This work will include installation of erosion controls, vegetation clearing, earthwork, installation of subsurface utilities, construction of stormwater management features, construction of roadways, construction of the wetland replacement area and landscaping.

The Proponent intends to file a Notice of Intent with the North Adams Conservation Commission for the project's impacts to resource areas. The Single EIR should outline any changes to anticipated wetlands impacts that may result from consultation with the North Adams Conservation Commission.

BVW impacts will be mitigated by the creation of a 500 +/- sf BVW replication area located between Wetland 2 and the proposed detention basin. The replication area will physically adjoin and maintain a hydraulic connection to the altered BVW and will provide equivalent wetland functions and values as the altered area. The replication area will be hand-planted with native wetland plants. A detailed wetlands replication plan should be provided in the Single EIR which, at a minimum, should include: replication location(s); elevations; typical cross sections; test pits or soil boring logs; groundwater elevations; the hydrology of areas to be altered and replicated; list of wetlands plant species of areas to be altered and the proposed wetland

replication species; planned construction sequence; and a discussion of the required performance standards and long-term monitoring.

Water and Wastewater

Water for the project will be supplied by the City of North Adams via a 10-inch municipal line on the southbound side of Route 8. The project is expected to require approximately 8,829 gallons per day (gpd) of water and to generate approximately 8,026 gpd of wastewater. Sanitary wastewater will flow from the site to an 8-inch North Adams municipal sewer main, and then to an 8-inch Town of Adams sewer main for treatment at the Town of Adams wastewater treatment plant. There is an existing intermunicipal agreement between North Adams and Adams for this arrangement. MEPA does not have subject matter jurisdiction over water and wastewater for the project; however I encourage the Proponent to address comments from BRPC on these issues.

Traffic

Access to the site will be provided via two driveways: 1) the existing signalized driveway will be retained and will serve as the primary access and egress point for the site; and 2) a secondary right-in/right-out driveway is proposed approximately 500 feet north of the existing traffic signal. The existing right-in driveway will be closed. The project is expected to generate approximately 5,550 net new daily vehicle trips (adt) on a weekday and 7,350 new adt on a Saturday. There are also expected to be an average of 5 to 7 truck trips per day over the course of the year.

The Proponent has prepared a Traffic Impact and Access Study (TIAS) in accordance with Executive Office of Energy & Environmental Affairs (EEA)/Executive Office of Transportation and Construction (EOTC) guidelines. The study was prepared in consultation with MassHighway, the Berkshire Regional Planning Commission (BRPC), the City of North Adams and the Town of Adams. The TIAS was submitted as part of the EENF.

The Proponent conducted an evaluation of flow and roadway capacity within the TIAS study area for existing, No-Build and Build conditions at signalized and unsignalized intersections to determine the impact of the project on the area roadway system. The analysis revealed that the project is not expected to result in an overall change in Level of Service (LOS) at signalized intersections. Several unsignalized intersections in the study area are expected to suffer decreased LOS under the Build condition.

The Proponent has outlined and committed to a transportation mitigation program in the EENF to address potential project-related traffic impacts and to help address existing operational and safety deficiencies. The following mitigation measures are proposed:

- The Proponent will implement access improvements at the main site drive intersection with Route 8, including replacing the existing traffic signal controller and installing new loop detectors on site drive approach;
- The Proponent will construct a new sidewalk along the south side of the site driveway and on the west side of Route 8;
- The Proponent will install a new pedestrian crossing of Route 8 on the south side of the existing signalized intersection of Route 8/Site Driveway/Hardman Industrial Park Access Drive;
- The Proponent will coordinate with the Berkshire Regional Transit Authority (BRTA) to install a sheltered bus stop for the BRTA Route #1 bus on the west side of Route 8. A bus bay will also be provided in order to improve safety. This stop will be provided in conjunction with the signalized crosswalk;
- The Proponent will restripe the intersection approaches as necessary to accommodate the improvements listed above;
- The Proponent will close the existing unsignalized right-in driveway and construct a new right-in/right-out driveway approximately 500 feet north of the main signalized driveway;
- The Proponent will widen Route 8 southbound by approximately 10 to 12 feet in order to accommodate the extension of the existing deceleration lane;
- The Proponent will work with MassHighway to implement minor adjustments to the signal timings at various intersections surrounding the project;
- The Proponent will implement a Transportation Demand Management (TDM) program to reduce peak employee traffic demand and to encourage alternative transportation modes for retail customers.

The Single EIR should include a commitment to implement the above referenced traffic mitigation measures and should describe the timing and cost of their implementation based on project phasing. The Single EIR should include conceptual plans for the proposed mitigation that are of sufficient detail to verify the feasibility of constructing such improvements, including lane widths and offsets, layout lines and jurisdictions and adjacent land uses.

In response to comments from BRPC, the Single EIR should contain a discussion of potential mitigation measures at the following intersections in North Adams: Route 8A (Hodges Cross Road/Church Street) at South Church Street and Route 8 (Curran Memorial Highway) at South State Street; and the following intersections in Adams: Route 8 (Columbia Street) at Friend Street and Route 8 (Park Street) at Hoosac Street.

The Proponent states in the EENF that it will provide MassHighway, BRPC and the Town of Adams with a full signal-feasibility study for the intersection of Route 8 with Friend Street and Renfrew Street. In the Single EIR, the Proponent should clarify whether this study will be provided. The Proponent should also address comments from BRPC regarding a potential center turn lane at the intersection of Route 8/Friend Street/Renfrew Street.

Transportation Demand Management

The EENF included a commitment to provide a Transportation Demand Management (TDM) program aimed at reducing site trip generation. Proposed TDM measures include:

- The Proponent will create and promote an on-site rideshare program, including ride-matching, accommodating work shifts, incentives and preferential parking;
- The Proponent will work closely with the BRTA to provide transit service to the site;
- The Proponent will install bicycle storage racks near the front doors of the retail site to facilitate bicycle access to the site.

In the Single EIR, the Proponent should provide a clear commitment to implement and continuously fund any TDM measures. The Proponent should also provide more information about bus service for site users traveling northbound on Route 8. The Single EIR should include a discussion of potential measures to address transit pricing issues with the BRTA; currently the BRTA pricing schedule requires users to pay an extra $1.10 each time they cross the North Adams/Adams town line.

Air Quality

The projected vehicle trips from the project triggered MassDEP's requirement that the Proponent conduct an air quality mesoscale analysis to determine if the proposed project will increase the amount of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the project area and to assess the project's consistency with the Massachusetts State Implementation Plan (SIP). The Proponent included the results of the mesoscale air quality analysis in the EENF.

The mesoscale air quality analysis evaluated existing and future levels of VOC and NOx emissions for the study area using the traffic volumes, delay and speed data presented in the project's TIAS. The results of the analysis reveal that 2012 Build Condition VOC and NOx emissions are greater than the 2012 No-Build Condition VOC and NOx emissions. Consistent with MassDEP guidelines, the Proponent will incorporate mitigation measures to reduce VOC and NOx emissions resulting from the project. These mitigation measures include construction of roadway and traffic signal improvements and a program of TDM measures. According to the EENF, the results of the mesoscale analysis demonstrate that the project complies with the federal Clean Air Act Amendments (CAAA) and the SIP for Massachusetts.

Greenhouse Gas Policy

In addition to the mesoscale air quality analysis, the proposed project is also subject to EEA's Greenhouse Gas (GHG) Policy that requires Proponents to quantify project-related GHG emissions and propose and quantify the impact of mitigation measures to reduce GHG emissions. The Proponent submitted the results of the GHG analysis with the EENF. In the study, the Proponent calculated GHG emissions from both mobile and stationary sources. The GHG emissions analysis evaluated the change in carbon dioxide (CO_2) emissions from project-related traffic and proposed building sources for the 2007 Existing, the 2012 No-Build, the 2012 Build and the 2012 Build with Improvements Conditions. Direct and indirect CO_2 emissions from the proposed building sources were calculated using the EQUEST model.

As can be seen in the Table below, under the Build Condition, CO_2 emissions are expected to increase by 4,494.7 tons per year (tpy) from the No-Build Condition. With recommended mitigation measures, CO_2 emissions are estimated to be reduced by 86.5 tpy, a 1.92 percent reduction.

GHG Analysis	2007 Existing Condition	2012 No-Build	2012 Build	2012 Build/No-Build Difference	2012 Build with Improvements	2012 Build with Improvements/ Build Difference	Percent Reduction in GHG Emissions between Build and Build with Improvements
Mobile Sources	27,783.9	29,796	33,855.5	4,059.5	33,837.7	- 17.8	0.44%
Direct/ Indirect Stationary Sources	686.8	686.8	1122	435.2	1,053.3	- 68.7	15.8%
Total	28,471.7	30,482.8	34,977.5	4,494.7	3,489.1	- 86.5	1.92%

(All data expressed in tons per year)

As mitigation for GHG emissions from mobile sources, the Proponent will modify signal phasing and timing to increase roadway capacity and reduce delays at project-area intersections. The Proponent will also implement a TDM program as described above to reduce project-generated vehicle trips. The analysis submitted with the EENF did not quantify the GHG reduction impact of proposed TDM measures. In the Single EIR, the Proponent should evaluate the impact of TDM measures following guidance in the EEA Policy.

The following mitigation measures are listed to help reduce GHG emissions from stationary sources: use highly-reflective (high-albedo) roofing materials, install high-efficiency HVAC systems, eliminate or reduce use of refrigerants in HVAC systems, and use low emitting materials. In another section of the EENF, the Proponent provided a discussion of sustainable design measures that it hopes to incorporate into project design once an architect is selected for the project. The EENF outlines a list of LEED (Leadership in Energy and Environmental Design) measures that Lowe's prototype buildings and construction program qualify for without modifications. The EENF also provides a list of sustainable design elements that are incorporated into most newly constructed Lowe's stores. The Proponent should clarify in the Single EIR what specific measures will be implemented by the Proponent at the North Adams site and should evaluate these measures as part of the updated response to the GHG policy.

The results of the EQUEST energy modeling are presented in an Appendix to the EENF. In the Single EIR, the Proponent should provide this information in an updated format. The information in the EENF is difficult to interpret; tables and graphs displaying electricity and gas consumption are not labeled and the units on graphs change without explanation. The Proponent should clearly present the results of calculations used to quantify existing conditions, the Build Condition, and the impact of proposed emissions-reduction mitigation. If the Proponent uses bar graphs, graphs should be produced in color so that the reader can understand the results. In response to the GHG Policy, the Single EIR should also present the data that were used to model energy use in the proposed building. A typical set of modeling inputs might include the following: Project size and configuration; type of heating, ventilation and cooling systems; amount of glazing; and potential types of usage and hours of operation.

The discussion in the EENF did not present a discussion of how the Proponent developed its GHG reduction mitigation alternatives. The GHG Policy states that when comparing the preferred alternative to other alternatives with greater GHG reduction, the Proponent should explain which alternatives were rejected, and the reasons for rejecting them. The Proponent should fully explain any trade-offs inherent in the evaluation of GHG reduction measures, such as increased impacts on some resources to avoid impacts to other resources.

The Proponent should commit in the Single EIR to additional GHG reduction mitigation. I understand that the nature of the project means that the majority of GHG emissions come from mobile sources, and that the project site location and proposed retail use do not lend themselves well to strategies to significantly reduce single-occupancy vehicle trips. I am satisfied with the Proponent's level of commitment to transportation-related mitigation outlined in the EENF. However, the GHG Policy requires mitigation for net project-related emissions; the Proponent should therefore evaluate non-transportation related mitigation to reduce overall GHG impacts. Effective on-site measures at large retail facilities include daylighting, and the use of solar photovoltaics on the building's roof or for parking lot lighting. The Proponent should also consider committing to purchasing power generated by renewable energy for electrical use. As a major chain retailer, the Proponent has the ability to consider additional feasible mitigation measures including off-site mitigation measures or offsets as outlined in the GHG Policy. I encourage the Proponent to consult with the MEPA office to evaluate potential off-site mitigation measures or offset strategies.

Construction Period Impacts

The Single EIR should include a discussion of construction phasing, evaluate potential impacts associated with construction activities, and propose feasible measures to avoid or eliminate these impacts. The Proponent must comply with MassDEP's Solid Waste and Air Quality Control regulations and should respond in the Single EIR to comments from MassDEP regarding demolition issues. The Proponent should implement measures to alleviate dust, noise and odor nuisance conditions which may occur during the construction activities. I encourage the proponent to work with MassDEP to implement construction-period diesel emission mitigation through its Diesel Retrofit Program, which can be reviewed online at http://www.mass.gov/dep/air/diesel/conretro.pdf.

Mitigation

The Single EIR should contain a separate chapter on mitigation measures. The chapter on mitigation should include a draft Section 61 Finding for use by MassHighway. The Section 61 Finding should contain a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation, the identification of the parties responsible for implementation of the mitigation, and a schedule for the implementation of the mitigation.

Comments

The Single EIR should include copies of all comments submitted on the EENF. In order to ensure that the issues raised by commenters are addressed, the Single EIR should include a response to comments. This directive is not intended to, and shall not be construed to, enlarge the scope of the Single EIR beyond what has been expressly identified in this Certificate.

Circulation

The Single EIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should be sent to commenters as listed below and to City of North Adams officials. A copy of the Single EIR should be made available for review at the North Adams Public Library.

March 14, 2008
Date

Ian A. Bowles

Comments received:

3/6/2008	Berkshire Regional Planning Commission
3/7/2008	Executive Office of Transportation
3/7/2008	Department of Environmental Protection, Western Regional Office
3/11/2008	Philip Weinberg, Department of Environmental Protection

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5

Air Quality

Introduction

This chapter presents a summary of the air quality study conducted for the Project located in North Adams, Massachusetts as described in Chapter 1, *Project Description*. The Massachusetts Department of Environmental Protection (DEP) has established guidelines that define the modeling and review criteria for air quality studies prepared pursuant to review under the Massachusetts Environmental Policy Act (MEPA). These guidelines require that mesoscale analyses be prepared for proposed development projects to determine the change in project-related ozone precursor emissions. The predominant source of ozone precursor emissions anticipated from the Project is emissions from Project-related traffic. Ozone is not directly emitted by motor vehicles, but is generated when volatile organic compounds (VOC) and oxidesof nitrogen (NOx) emissions from motor vehicles, stationary sources, and area sources react in the atmosphere with sunlight and heat. Project-related ozone impacts are determined by assessing the changes in VOC and NOx emissions of motor vehicles. The DEP criteria require that proposed development projects include all reasonable and feasible emission reduction mitigation measures if the emissions from the Build Condition are greater than the No-Build Condition. Massachusetts has incorporated this criterion into the State Implementation Plan (SIP).

The mesoscale analysis evaluated the change in emissions from Project-related traffic for the 2007 Existing, the 2012 No-Build, and the 2012Build Conditions, and the 2012 Build with Mitigation Conditions. The air quality analysis demonstrates that the proposed Project meets the DEP air quality criteria. Under the Build Condition, the VOC emissions were estimated to increase by 5.5 kg/day and the NOx emissions by 9.6 kg/day from the No-Build Condition. With the recommended mitigation measures, the VOC and NOx emissions are estimated to be reduced by 0.2 kg/day and 0.1 kg/day, respectively, from the 2012 Build Conditons. The analysis of Project-related impacts indicates that with the implementation of improvements, the additional site-generated traffic associated with the Project will not have an adverse impact on the majority of intersection traffic operations. Additionally, the proposed Transportation Demand Management (TDM) program measures are expected to reduce the VOC and NOx emissions associated with the proposed Project, therefore, demonstrating compliance with the transportation conformity criteria.

The greenhouse gas emissions analysis evaluated the change in CO2 emissions fron Project-related traffic and proposed building sources for the 2007 Existing, the 2012 No-Build, the 2012 Build, and the 2012 Build with Improvement Conditions. Under the Build Condition, the CO2 emissions were estimated to increase by 4,494.7 tons/year from the No-Build Condition. However, with the recommended mitigation measures, and improvement measures associated with the proposed building systems, the CO2 emissions are estimated to be reduced by 86.5 tons/year from the 2012 Build Condition. The greenhouse gas emissions analysis demonstrate that the Project meets the Executive Office of Energy and Environmental Affairs (EEA) draft policy on GHG emissions. The Project will include mobile and stationa source mitigation measures that will result in reduced GHG emissions for the 2012 Build with Mitigation condition.

Air Quality Modeling Methodology

The DEP guidelines require that the ozone mesoscale analysis use traffic and emissions data for existing and future (No-Build and Build) conditions. The traffic and emissions data are incorporated into the DEP and the U.S. Environmental Protection Agency (EPA) air quality models and modeling procedures to generate emissions estimates that demonstrate whether the Project will have air quality impacts. The air quality study evaluated four conditions:

- The 2007 Existing Condition represents current traffic conditions in the study ar and assumes no vehicle trips to the Project Site;
- The 2012 No-Build Condition reflects existing traffic volumes increased to accou for anticipated background traffic volume growth, and includes traffic related t specific development projects within the study area that are expected to be completed by 2012, and assumes no Project-related vehicle trips;
- The 2012 Build Condition reflects the 2012 No-Build Condition traffic volumes plus Project-related vehicle trips; and
- The 2012 Build with Mitgation Condition reflects the 2012 Build Condition plus the proposed mitigation measures (such as signal timing modification).

The mesoscale analysis calculated the changes in VOC and NOx emissions for the existing and future conditions within the study area. The year 2012 was selected as the future year of analysis because MEPA's policy requires that a project look five years into the future from the current year of analysis. The mesoscale analysis traff (volumes, delays, and speeds) and emission factor data were developed for the thr conditions. These data were incorporated into air quality models to demonstrate whether or not the Project will meet the Clean Air Act Amendments (CAAA) and S criteria. The modeling procedures proposed for this air quality study were submitt to DEP for their review in a letter dated July 16, 2007. A copy of this letter is includ in Attachment J

Mesoscale Analysis

The purpose of the mesoscale analysis is to estimate the area wide emissions of VOC and NOx during a typical day in the peak ozone season (summer) consistent with the requirements of the SIP. The mesoscale analysis evaluates the change in VOC and NOx emissions from the average daily traffic volumes, roadway lengths, and vehicle emission rates. To demonstrate compliance with the SIP criteria, the air quality study must show the Project's change in daily (24-hour period) VOC and NOx emissions. Using EPA-recommended air quality modeling techniques, total pollutant emissions were calculated for the Project under the three conditions. The mesoscale study area includes, at a minimum, all the roadway links and intersections that are projected to experience an increase of ten percent in traffic due to the project and that experience Level-of-Service (LOS) designation of D or lower under existing or future conditions. The specific roadways included Route 8A, Route 8, Church Street, Friend Street and Hoosac Street. A map of the roadways included in the mesoscale study area is included in Appendix D.

Emission Rates

The vehicle emission factors used in the mesoscale analysis were obtained using the EPA's MOBILE6.2[1] emissions model. MOBILE6.2 calculates emission factors from motor vehicles in grams per vehicle-mile for existing and future conditions. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts-specific conditions such as the vehicle age distribution, the statewide Inspection and Maintenance (I/M) Program, and the Stage II Vapor Recovery System[2]. Emission factors for the mesoscale analysis were determined using the DEP-recommended temperatures for the summer (ozone) season. A detailed presentation of the MOBILE6.2 input and output data are presented in Appendix D.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mesoscale analysis uses typical daily peak and off-peak traffic volumes for the ozone season (summer). Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The traffic data used in the air quality study are presented in Appendix D. The detailed traffic analysis is presented in Chapter 4, *Transportation*.

1 MOBILE6.2 (Mobile Source Emission Factor Model), The May 2004 release from US EPA, Office of Mobile Sources, Ann Arbor, MI.

2 The Stage II Vapor Recovery System is the process of collecting gasoline vapors from vehicles as they are refueled. This requires the use of a special gasoline nozzle at the fuel pump.

Existing Conditions

The 1990 CAAA divided states into attainment and non-attainment areas with classifications based upon the severity of the air quality problem. Massachusetts has been determined to be a non-attainment area, statewide, for ozone. The State has been divided into two non-attainment areas, Eastern and Western Massachusetts. On June 15, 2005, the EPA revoked the 1-hour ozone standard for most areas in the country. This action means that the 1-hour ozone non-attainment area classified as "Serious," is no longer applicable for Eastern Massachusetts. Only the 8-hour ozone National Ambient Air Quality Standard (NAAQS) applies. The Project is located in the Western Massachusetts 8-hour ozone non-attainment area, which has been classified as "Moderate."

The mesoscale analysis calculated the 2007 VOC and NOx emissions from the major roadways in the study area. These emissions, estimated to be 78.8 kilograms per day (kg/day) of VOCs, and 172.1 kg/day of NOx, establish a baseline to which future emissions can be compared. Table 5-1 presents the mesoscale analysis results for existing conditions.

Project Impacts

Future Project-related emission calculations are based upon changes in traffic and emission factor data. The traffic data include traffic volumes, vehicle-miles-of-travel, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The following section reports the findings of the mesoscale analysis for the Project.

The mesoscale analysis estimated the future study area VOC and NOx emissions due to the changes in traffic and emission data. Under the 2012 No-Build Condition, VOC emissions were estimated to be 49.2 kg/day, and NOx emissions were estimated to be 92.8 kg/day. The future No-Build Condition VOC and NOx emissions are lower than the 2007 Existing Conditions emissions due to the implementation of emission control programs, such as the Federal Motor Vehicle Emission Control Program, the Stage II Vapor Recovery System, and the Massachusetts Vehicle Inspection and Maintenance program.

Under the 2012 Build Condition, the VOC emissions were estimated to be 54.7 kg/day and the NOx emissions were estimated to be 102.4 kg/day. This results in an increase of 5.5 kg/day in VOC emissions and an increase of 9.6 kg/day in NOx emissions from the 2012 No-Build Condition. Table 5-1 presents the mesoscale analysis results for all conditions.

The DEP criteria requires that the Project incorporate air quality mitigation measures because the 2012 Build Condition VOC and NOx emissions are greater than the 2012 No-Build Condition VOC and NOx emissions.

Table 5-1
Mesoscale Analysis Results*

Pollutant	2007 Existing Condition	2012 No-Build Condition	2012 Build Condition	Build / No-Build Difference
Volatile Organic Compounds	78.8	49.2	54.7	5.5
Oxides of Nitrogen	172.1	92.8	102.4	9.6

*Kilograms Per Day

Proposed Mitigation Measures

The Proponent will implement signal improvements to the roadways to reduce delays and queing, as part of the Project in order to minimize peak-period traffic demands in the study area. The mesoscale analysis calculated the changes in VOC and NOx emissions due to the roadway mitigation. The results of the mesoscale analysis demonstrate that the roadway improvements will meet the transportation conformity criteria by reducing both VOC and NOx emissions. The VOC and NOx emissions for the 2012 Build with Mitigation Condition were calculated to be 54.5 kg/day and 102.3 kg/day, respectively. The mitigation measures would result in a 0.2 kg/day VOC emissions reduction and a 0.1 kg/day NOx emissions reduction from the 2012 Build Condition. Table 5–2 presents the results of the mitigation analysis.

Table 5-2
Mesoscale Analysis Results with Mitigation Condition*

Pollutant	2007 Existing Condition	2012 No-Build Condition	2012 Build Condition	2012 Build w/ Mitigation Condition	Build with Mitigation/ Build Difference
Volatile Organic Compounds (VOCs)	78.8	49.2	54.7	54.5	-0.2
Oxides of Nitrogen (NOx)	172.1	92.8	102.4	102.3	-0.1

*Kilograms Per Day

The Proponent will also implement a TDM program as part of the Project in order to reduce Project-generated vehicle trips and to minimize peak-period traffic demands in the study area. While the mesoscale analysis does not quantify the emission

reductions from proposed TDM mitigation measures, their implementation is expected to result in additional improvements to air quality in the study area.

The following TDM measures will be provided by the Proponent to further reduce peak employee traffic demand on the roadway system and encourage alternative transportation modes for serving the on-site retail customers:

- Construct pedestrian and bicycle facilities;
- Provide public transit facilities to encourage use of; and
- Implement a ridesharing program.

The detailed TSM measures and discussions are presented in Chapter 4, *Transportation*.

Greenhouse Gas Emissions Analysis

The Executive Office of Energy and Environmental Affairs (EEA) has recently developed and issued a policy that requires project proponents to identify and describe the feasible measures to minimize GHG emissions. This policy requires that projects undergoing review by the MEPA Office at the EIR level and meeting specific criteria (e.g., generation of 3,000 or more vehicle trips per day) quantify the project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying project-related GHG emissions, the policy also requires proponents to quantify the impact of proposed mitigation in terms of emissions and energy savings. The goal of this policy is to identify measures to reduce or minimize the GHG emissions.

The purpose of this section is to calculate the GHG emissions from mobile sources and both direct and indirect stationary sources related to the proposed Project. While GHG emissions include several gases, Carbon Dioxide (CO2) was selected for evaluation because it is the most significant component of project-related GHG emissions.

The air quality study calculated GHG emissions from mobile and stationary sources. The mobile source emissions were calculated by performing a yearly GHG emissions mesoscale analysis to evaluate the changes in CO2 emissions for the existing and future conditions within the study area. Similar to the mesoscale analysis for ozone, the year 2012 was selected as the future year of analysis because MEPA's policy requires that a project look five years into the future from the current year of analysis. The mesoscale analysis traffic (volumes, delays, and speeds) and emission factor data were developed for four conditions, 2007 Existing, the 2012 No Build, the 2012 Build, the 2012 Build with improvements conditions. In addition to mobile sources, direct and indirect CO2 emissions from the Project's proposed building

sources were calculated using the computer-based EQUEST model[3]. Direct emissions included those emissions from the facility itself such as boilers, heaters, and internal combustion engines. Indirect emissions included CO2 emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Total CO2 emissions were determined by combining the CO2 results from the mesoscale analysis with the CO2 emissions from the proposed direct and indirect building sources.

Mobile Source Analysis

The GHG mobile source analysis was conducted following procedures similar to the ozone mesoscale analysis. The mesoscale analysis estimated the area wide CO2 emissions from vehicle traffic for a time period of one year. The change in CO2 emissions from traffic were based on the average yearly traffic volumes, roadway lengths and vehicle emissions factors for existing and new trips for weekday and weekend conditions.

Mobile Source Emission Rates

Currently MOBILE6.2 has a simple estimate of CO2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts specific conditions. A detailed presentation of the MOBILE6.2 input and output data are presented in Appendix D.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mesoscale analysis for CO2 emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The traffic data used in the air quality study are presented in Appendix D. The detailed traffic analysis is presented in Chapter 4, *Transportation*.

Stationary Source Analysis

The proposed Project will generate GHG emissions thru the use of electricity and fossil fuels. The stationary source analysis calculated project-related CO2 emissions

3 EQUEST (the Quick Energy Simulation Tool), version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA

from these building sources using the computer-based EQUEST model. These building sources included boilers, heaters and internal combustion engines. While the proposed Project in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. The stationary source analysis calculated GHG emissions for two conditions, the 2012Build, the 2012 Build with improvements. The 2012 Build condition represents the stationary source emissions that would occur if the proposed Project were to be built using typical construction materials and rooftop equipment. The 2012 Build with improvements condition represents the proposed Project emissions based upon the use of improved building materials and rooftop equipment.

Existing Conditions

EPA has not set NAAQS for greenhouse gases, however, they do encourage strategies to reduce emissions and save fuel. EEA and MEPA's draft GHG emissions policy calls for proposed projects to reduce, minimize, or mitigate these emissions. The calculation of 2007 Existing condition emissions provides a base for which future years can be evaluated.

Existing Mobile Source Emissions

The mesoscale analysis calculated the 2007 CO2 emissions from the major roadways in the study area. These emissions, estimated to be 27,783.9 tons/year, establish a baseline to which future emissions can be compared. Table 5-3 presents the existing CO2 analysis results for existing conditions.

Existing Stationary Source Analysis

The GHG analysis calculated the 2007 CO2 emissions for direct and indirect emissions from the existing stationary sources. Under the 2007 Existing Condition, the CO2 emissions were estimated to be 686.8 tons per year, establishing a baseline to which future emission can be compared. Table 5-3 presents the existing CO2 analysis results for existing conditions.

Project Impacts

Future Project-related emission calculations are based upon changes in traffic and emission factor data as well as the proposed Project's building sources. The traffic data include traffic volumes, vehicle-miles-of-travel, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The proposed Project's

building sources included direct emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following section reports the findings of the mesoscale and stationary source analyses for the proposed Project.

Future Mesoscale Emissions

The mesoscale analysis estimated the future study area CO2 emissions due to the changes in traffic and emission data. Under the 2012 No-Build Condition CO2 emissions were estimated to be 29,796.0 tons per year.

Under the 2012 Build Condition, the CO2 emissions were estimated to be 33,855.5 tons per year. Under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 33,837.7 tons per year. This results in a decrease of 17.8 tons per year in CO2 emissions as compared to the 2012 Build Condition. This reduction is due to the signal timing improvements of the study area roadways. Table 5-3 presents the mobile source analysis results for all conditions.

Future Stationary Source Emissions

The stationary source analysis calculated 2012 Build and 2012Build with improvements CO2 emissions for direct and indirect emissions from stationary sources. Direct emissions included those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions included those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Under the 2012 Build Condition, the CO2 emissions were estimated to be 1122.0 tons per year. Under the 2012 Build Condition with improvements, the CO2 emissions were estimated to be 1053.3 tons per year. This results in a decrease of 68.7 tons per year in CO2 emissions as compared to the 2012 Build Condition. This reduction is due to the building mitigation measures discussed below.

Table 5-3 presents CO2 emissions from mobile and direct and indirect stationary sources under all conditions.

Table 5-3
CO2 Analysis Results with Mitigation Condition*

GHG Analysis	2007 Existing Condition	2012 No-Build Condition	2012 Build Condition	2012 Build/ No-Build Difference	2012 Build w/ Improvements Condition	2012 Build with Improvements/ Build Difference
Mobile Source Analysis	27,783.9	29,796.0	33,855.5	4,059.5	33,837.7	-17.8
Direct /Indirect Stationary Source	686.8	686.8	1122.0	435.2	1,053.3	-68.7
Total	28,470.7	30,482.8	34,977.5	4,494.7	3,489.1	-86.5

*Tons per Year

■

Proposed Improvements

The EEA and MEPA draft GHG emissions policy encourages project proponents to identify and quantify measures that would reduce or minimize GHG emissions from mobile sources and direct and indirect stationary sources. The Proponent has developed physical and operational mitigation measures to be included in the proposed Project. The following is a partial list of these mitigation measures. They include:

Mobile Sources

- Modify signal phasing and timing plan to increase capacities and reduce delays of the intersection.

The Proponent will also implement a TDM program as part of the Project in order to reduce Project-generated vehicle trips and to minimize peak-period traffic demands in the study area. While the mesoscale analysis does not quantify the emission reductions from proposed TDM mitigation measures, their implementation is expected to result in additional improvements to air quality in the study area.

The implementation of the TDM program is expected to improve air quality in the study area by increasing the number of persons in a vehicle, and promoting the use of alternative modes of travel. The Proponent will investigate to develop the following possible TDM measures:

- Provide less parking spaces than what is required under local zoning;
- Construct pedestrian and bicycle facilities;
- Provide public transit facilities to encourage use of alternative transportation; and
- Implement a ridesharing program.

The detailed TSM measures and discussions are presented in Chapter 4, *Transportation*.

Stationary Sources

- Use highly-reflective (high-albedo) roofing materials
- Install high-efficiency HVAC systems
- Eliminate or reduce use of refrigerants in HVAC systems
- Use low emitting materials

Conclusion

The air quality study demonstrates that the Project complies with the Clean Air Act Amendments (CAAA), the State Implementation Plan (SIP), and the Executive Office of Energy and Environmental Affairs (EEA) policy on Greenhouse Gas emissions. The ozone mesoscale analysis demonstrates that the Project will result in an increase of VOC and NOx emissions, as compared to the No-Build Condition.

Consistent with the guidelines of the Massachusetts Department of Environmental Protection (DEP), the Project will incorporate reasonable and feasible mitigation measures to reduce VOC and NOx emissions. These mitigation measures include roadway improvements, traffic signal improvements and a TDM program. The implementation of these mitigation measures will help reduce the VOC and NOx emissions associated with the Project. The GHG emissions analysis demonstrates that the Project meets the EEA draft policy on GHG emissions because it includes mobile and stationary source mitigation measures that will reduced the GHG emissions.

The air quality study demonstrates that the Project conforms to the CAAA, the SIP, and EEA GHG policy because:

- It will implement reasonable and feasible emission reduction mitigation measures;
- No new violation of the NAAQS will be created;
- No increase in the frequency or severity of any existing violations will occur; and
- No delay in attainment of any NAAQS will result.

To: Briony Angus
From: Philip Weinberg
Re: North Adams Plaza Redevelopment-GHG supplementary comments
Date: 3/11/08

The Department commends Lowes' corporate-wide commitment to incorporate LEED sustainable design elements. The report, at 1-3, indicates that those elements are incorporated into "most" of Lowe's new construction. The report does not list all the sustainable elements that went into its GHG mitigation analysis, so the proponent should make clear that it is committing to all of the sustainable elements noted in the report, or identify which ones are not included and provide a justification for their exclusion on this project. Further, it is not possible for any reviewer to verify or evaluate the analysis presented in the CO2 summary analysis presented in Table 5-3 for the direct/indirect stationary sources without a presentation of any of the supporting data. Further details documenting the mitigation assessment should be provided in the subsequent report.

There are several GHG/air quality mitigation measures that you have not discussed which should be examined and adopted in the subsequent filing. These include:

a. Recycling of demolition debris and used new construction materials. At a minimum, the proponent should commit to recycling 75% of the debris generated, as provided in the LEED for New Construction guideline and to avoid non-compliance with regulatory bans on disposal of C&D debris.
b. Diesel retrofits for construction equipment. Diesel emissions from off-road construction equipment can be substantially reduced through retrofits to reduce diesel-related pollutants. As a mitigation measure, the proponent should secure commitments from the contractor and through the sub-contractors to require retrofitted equipment unless it is infeasible to secure. The MassDEP web site has further information at http://www.mass.gov/dep/air/diesel/conretro.doc.
c. Green Power-There is no demonstration that it is technically infeasible or cost prohibitive to install solar power on-site to generate energy for either the main building or the garden center. Alternatively, there is no commitment to purchase power generated by renewable energy sources for any portion of the electricity use on the site. LEED for New Construction/Retail requires a 35%-50% renewable energy commitment, and the proponent should demonstrate why using a green power energy source is infeasible or cost-prohibitive.

The Commonwealth of Massachusetts

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8/18/08 (E)
MC
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August 15, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
SINGLE ENVIRONMENTAL IMPACT REPORT

PROJECT NAME:	North Adams Plaza Redevelopment
PROJECT MUNICIPALITY:	North Adams
PROJECT WATERSHED:	Hudson
EEA NUMBER:	14180
PROJECT PROPONENT:	North Adams Property Development, LLC
DATE NOTICED IN MONITOR:	July 9, 2008

As Secretary of Energy and Environmental Affairs (EEA), I hereby determine that the Single Environmental Impact Report (Single EIR) submitted on this project **does not adequately and properly comply** with the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00). Therefore, the Proponent must submit a Supplemental EIR in accordance with Section 11.08(8)(d)(3) of the MEPA regulations.

While the Single EIR has adequately evaluated project impacts related to traffic, wetlands and stormwater, and identified sufficient mitigation for those impacts, the Proponent has not adequately addressed the requirements of the EEA Greenhouse Gas (GHG) Emissions Policy. The discussion of project-related GHG impacts and mitigation has advanced significantly in the Single EIR from the discussion in the Expanded Environmental Notification Form (EENF), and I commend the Proponent for its commitment to the environment and to mitigating GHG emissions reflected in the Single EIR. However, the discussion of GHG impacts and mitigation in the Single EIR is not supported by the requisite technical analysis and data. I am therefore requiring the preparation of a limited-scope Supplemental EIR, which will provide an opportunity to resolve outstanding details regarding GHG analysis and data prior to allowing the project to proceed to the state permitting process. The limited scope for the Supplemental EIR is outlined below.

In requiring the Supplemental EIR, I am aware that the proposed project has numerous potential benefits. It involves the redevelopment and reuse of a previously developed site with existing infrastructure. It has the potential to enhance the local tax base and to provide employment and retail opportunities for the local and regional area. The requirement for a Supplemental EIR is not intended to be an impediment to achieving the environmental and economic benefits of the project. However, as outlined below, outstanding issues remain to be resolved before MEPA review on the project can be completed.

Project Description

As described in the February 2008 Expanded Environmental Notification Form (EENF) and the Single EIR, the project involves the redevelopment of a vacant strip commercial plaza on an approximately 13.4-acre parcel located on the west side of Route 8 across from the Robert Hardman Industrial Park in North Adams. The site has been underutilized for approximately a decade and vacant since 2006. An approximately 95,712 square foot (sf) structure that formerly housed a cinema and a mix of restaurant and retail uses remains as well as approximately 630 parking spaces. The redevelopment includes demolition of the existing structure and construction of an approximately 126,500 sf Lowe's home improvement store with an associated 28,630 sf garden center and an approximately 3,600 sf separate drive-through bank or other retail facility on an out-parcel in the southeasterly corner of the site. Previously, a home improvement store was proposed on a site north of the proposed site. An EENF for that project was submitted in July 2005 (EEA# 13578). That project is no longer under consideration.

Approximately 620 parking spaces will be provided as part of the project. Access to the site will be provided via two driveways: 1) the existing signalized driveway to the site will be retained and will serve as the primary access and egress point for the site; and 2) a secondary right-in/right-out driveway is proposed approximately 500 feet north of the existing traffic signal. The existing right-in driveway will be closed.

Jurisdiction

The project is undergoing environmental review and requires the preparation of an Environmental Impact Report pursuant to Section 11.03(6)(a)(6) of the MEPA regulations because it requires state permits and it will generate more than 3,000 new average daily trips on roadways providing access to a single location. The project requires a National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the U.S. Environmental Protection Agency (EPA) and a Vehicular Access Permit from the Massachusetts Highway Department (MassHighway). The Proponent has received a Special Permit from the North Adams Planning Board and a permit from the North Adams Zoning Board of Appeals to reduce parking at the site to less than what is required under local zoning. The Proponent received an Amended Order of Conditions (OOC) from the North Adams Conservation Commission in July 2008.

Because the Proponent is not seeking financial assistance from the Commonwealth for the project, MEPA jurisdiction is limited to those aspects of the project that may cause significant Damage to the Environment and that are within the subject matter of required or

potentially required state permits. In this case, jurisdiction extends to transportation, wetlands and stormwater. In addition, because the project requires a Vehicular Access Permit, the project is subject to the MEPA Greenhouse Gas Emissions Policy and Protocol.

Review of the non-GHG Sections of the Single EIR

The overall project has not changed since the submittal of the EENF. The Single EIR provided an updated discussion of project impacts related to stormwater, wetlands and traffic. The Single EIR provided a discussion of the project's consistency with the *Regional Plan for the Berkshires* (Berkshire Regional Planning Commission (BRPC), May 2000), the *North Adams Community Development Plan* (BRPC, June 2004), and with Executive Order 385 – Planning for Growth.

To meet the revised MassDEP Stormwater Management Regulations (February 2008), an extended detention stormwater wetland has been proposed in place of the basic dry detention basin. The constructed stormwater wetland will provide optimal stormwater treatment as well as peak attenuation for runoff from the development. The Proponent received an OOC for the project in May 2008 that was appealed due to concerns regarding stormwater discharge from the west of South State Street onto an abutting property. All parties agreed to a Stay of Appeal, and additional information on stormwater management was provided to the North Adams Conservation Commission. An Amended OOC for the project was issued on July 7, 2008, and subsequently the Appeal was withdrawn.

The project will result in the alteration of approximately 185 sf of Bordering Vegetated Wetlands (BVW). Impacts to BVW will be mitigated by the creation of an approximately 500 sf BVW replication area located between the existing BVW and the proposed detention basin. Details of the BVW replication area, including a planting schedule, construction sequence and a post-construction monitoring plan are included in the SEIR.

The Proponent updated the Traffic Impact and Access Study (TIAS) in the SEIR to respond to comments from MassHighway and the BRPC. The Single EIR has adequately resolved issues related to traffic impacts and mitigation. The Single EIR outlined the proposed Transportation Demand Management (TDM) program that will be implemented by the Proponent.

The Single EIR outlined a plan to minimize and mitigation construction period impacts. The Proponent has committed in the Single EIR to utilizing ultra low-sulfur diesel fuel for construction vehicles. The Proponent will use straw bales as an alternative to hay bales to reduce the potential for the introduction of invasive species.

Mitigation

The Proponent has committed to the following mitigation in the Single EIR:

- Structural and non-structural stormwater Best Management Practices (BMPs) will be implemented to mitigate site stormwater runoff and remove a minimum of 80 percent of total suspended solids (TSS).
- The Proponent will construct access improvements at the main site drive intersection with Route 8, including upgrading existing signal equipment and improving pedestrian access and pedestrian safety. The Proponent will also close the existing unsignalized right-in driveway and construct a new right-in/right-out driveway. The Proponent will implement minor adjustments to the signal timings at various intersections in the project area.
- The Proponent will provide MassHighway, the BRPC and the Town of Adams with a full signal-feasibility study for the intersection of Route 8 with Friend Street and Renfrew Street.
- The Proponent will provide a new pedestrian crossing on the south side of the existing signalized intersection of Route 8 with the site driveway and the Hardman Industrial Park site drive. The crossing will accommodate pedestrians using the BRTA system in either the northbound or the southbound directions.
- The Proponent will construct a new bus bay on the west side of Route 8 in front of the site.
- The Proponent will implement a Transportation Demand Management (TDM) plan to reduce peak employee traffic demand on the roadway system and encourage use of alternative transportation modes by retail customers.
- During construction, erosion and sedimentation control measures will be implemented and the Proponent will prepare a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the NPDES General Permit.
- As outlined in the Construction Management Plan submitted in the EENF, the Proponent will implement measures during construction to minimize temporary impacts related to noise, dust/air quality, and truck traffic.

SCOPE

The Supplemental EIR should contain a copy of this Certificate and a copy of each comment letter received on the Single EIR. Due to the limited scope for the Supplemental EIR, the Proponent should address only those comments that are relevant to the GHG Policy. Remaining comments submitted on the Single EIR can be addressed during permitting.

The Supplemental EIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should be sent to any state agencies from which the Proponent will seek permits or approvals, to the list of "comments received" below, and to City of North Adams officials. A copy of the Supplemental EIR should be made available for public review at the North Adams Public Library.

The EENF contained the Proponent's initial response to the GHG Policy, including an analysis of project-related GHG emissions from mobile and stationary sources, and a discussion of possible emissions-reduction mitigation. The Certificate on the EENF required the Proponent to provide an updated GHG analysis in the Single EIR and encouraged the Proponent to commit to additional GHG mitigation. The Certificate stated that the Proponent's commitment to transportation mitigation outlined in the EENF was sufficient, and directed the Proponent to

identify additional non-transportation measures to serve as mitigation for net emissions for the whole project.

The Single EIR presents a much expanded and improved discussion related to GHG emissions. The Proponent has identified and committed to the following specific mitigation measures to reduce GHG emissions from stationary sources:

- High-efficiency Energy Star compliant packaged heating, ventilation and air-conditioning (HVAC) systems;
- Double Low-E glass windows to minimize heat loss;
- Motion sensors and lighting in the building's office space to reduce energy consumption;
- Additional roof insulation to minimize heat loss;
- White thermoplastic olefin (TPO) membrane roofing to reduce heat island effect on rooftop; and,
- Partial skylights at the garden center to reduce electrical usage.

As outlined in the Single EIR, the Proponent is also committed to the following programs corporate-wide:

- Lowe's Energy Awareness Delivers Savings (LEADS) – The LEADs program is an energy awareness program for employees that seeks to promote measures to reduce GHG emissions and water consumption.
- Sale of Energy Star-qualified products – Lowe's participates in the U.S. EPA's Retail Partnership Program, and offers a variety of Energy Star products at its stores, including fans, dishwashers, lighting units, programmable thermostats, and sealing and insulation products.
- Lowe's Energy Management Program – Lowe's implements energy management systems at each of their stores to reduce energy usage. The Proponent estimates that participation in the Energy Management Program results in an annual reduction of 4.4 tons of carbon dioxide (CO_2).
- Green Power Purchasing Partnership – Lowe's purchases green power generated from renewable resources and allocates two percent of green power purchasing credit to each store. The Proponent estimates that GHG reductions due to the green power purchasing credit are approximately 18 tons per year (tpy) for the North Adams project.
- SmartWay Transport Partnership Program – This program is a partnership between the U.S. EPA and the freight industry to increase energy efficiency while reducing GHG emissions. The Proponent estimates that participation in the SmartWay program results in an annual reduction of 11.2 tons of CO_2.

I commend the Proponent for its commitment to mitigation measures related to energy efficiency and renewable power. As noted above however, this commitment has not been reflected in the technical analysis submitted in the Single EIR. EEA acknowledges that the quantification and modeling required by the GHG Emissions Policy is not intended to result in absolutely accurate projections. The desired outcome is a reasonably accurate quantitative analysis of total project emissions and potential mitigation that will allow the Proponent and reviewers to assess the overall impact of the project as proposed, and the reduction in emissions

if various measures are implemented. The Proponent should resolve the issues outlined below in order to demonstrate that the additional mitigation measures have been adequately evaluated following the guidance in the GHG Emissions Policy & Protocol. I note that the Proponent has recently provided the MEPA Office with additional information in response to several of the issues below; however, this information would benefit from additional public and state agency review, which will be afforded by the Supplemental EIR.

- The Proponent should explain why the amount of GHG emissions for the 2012 Build scenario for stationary sources changed between the EENF (1,122 tpy) and the Single EIR (1,193.5) tpy.
- The Proponent should explain why the amount of GHG emissions for the 2012 Build with Mitigation scenario for stationary sources is the same in the EENF and Single EIR (1,053.2 tpy), despite making additional mitigation commitments in the Single EIR.
- Due to the above, the increased difference between the 2012 Build and the 2012 Build with Mitigation scenarios for stationary sources in the Single EIR (140.3 tpy reduction compared to a 68.7 tpy reduction) does not appear to be due to any additional mitigation or improvements in the modeling, but instead because the 2012 Build scenario in the Single EIR is 71.5 tons greater than the 2012 Build in the EENF. The Proponent should clearly demonstrate that any anticipated reduction in stationary source emissions is due to increased mitigation, and not due to the change in the 2012 Build scenario between the EENF and Single EIR.
- The Single EIR states that a decrease in emissions of 140.3 tpy for stationary sources will result in an 11.8 percent decrease in CO_2 emissions, which represents an increase from the 6.1 percent reduction presented in the EENF. These figures are inconsistent with EEA's analysis of the anticipated reductions, based on the data presented in the EENF and Single EIR. The Proponent should consult with EEA on the methodology for determining percentage reductions.
- The Proponent should clarify whether the GHG analysis and mitigation is directed solely towards the proposed Lowe's building, or whether it incorporates the smaller additional building proposed on the southeast portion of the site. The requirements of the GHG policy apply to the entire project.
- The Proponent did not evaluate the benefits of the proposed TDM measures with regard to GHG emissions in the EENF. The Proponent has evaluated TDM measures using EPA's COMMUTER Version 2.0 model; however it is unclear which TDM measures listed on page 3-3 of the Single EIR were evaluated, and the Single EIR did not contain supporting data for the analysis.

The Proponent has evaluated the installation of a 50-kilowatt (kW) solar photovoltaic (PV) system on the proposed Lowe's building pursuant to the requirement of the GHG Emisions Policy to consider alternative mitigation measures. As outlined in the Single EIR, the payback period for a 50 kW solar system at the proposed project is calculated to be approximately seven years, which, according to the Proponent is longer than rate of return permitted by Lowe's corporate guidelines. The Proponent should address comments from the Department of Environmental Protection (MassDEP) and the Department of Energy Resources (DOER) regarding the analysis of solar PV. The Supplemental EIR should elaborate on the methodology used to determine the payback assessment, and provide additional specific information on how

state and federal rebate and/or tax incentives affected the payback period. Given that the Proponent will likely own the project for far longer than seven years, the anticipated reduction in payback of solar PV due to technological advances, and the increasing cost trend for electricity, it is not clear why a seven-year payback should preclude implementation of PV for this project.

Finally, it is not clear from a review of the Single EIR that the Proponent has maximized opportunities to mitigate emissions through off-site mitigation or measures. As requested in the Certificate on the EENF, I strongly encourage the Proponent to consult with the MEPA Office regarding the potential for off-site mitigation or offsets.

Mitigation

The Proponent should submit an updated discussion of mitigation and an updated Section 61 Finding for MassHighway to reflect any changes proposed in the Supplemental EIR.

August 15, 2008
Date

Ian A. Bowles

Comments received:

7/25/2008	Department of Environmental Protection, Western Regional Office
8/6/2008	Berkshire Regional Planning Commission
8/8/2008	Department of Environmental Protection
8/8/2008	Executive Office of Transportation
8/8/2008	Berkshire Environmental Action Team

IAB/BA/ba

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Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

To: Briony Angus
From: Phil Weinberg
Re: North Adams Plaza Redevelopment
Date: 8/8/08

Set out below is DEP and DOER's comment on the GHG section of the DEIR for the North Adams Development.

GREENHOUSE GAS POLICY

Stationary Source Emissions

The Greenhouse Gas mitigation measures identified by the proponent in the Single EIR expands upon its preliminary analysis presented in the EENF and indicates that the proponent examined means it can reduce its carbon footprint. The discussion of its store's mitigation measures are focused on energy efficiency, which will lower the facility's operating costs and offer a solid return on investment. Of particular note in identifying additional GHG mitigation is Lowe's commitment to secure 2% of the store's total energy consumption through Green Power purchasing. The SEIR was partially responsive to the GHG Policy's protocol that the proponent set out the rationale for declining to adopt more aggressive reduction measures, in this case investment in photovoltaics. As discussed in the DOER comment below, in light of the long term efficiency and operating cost reductions that PV would yield, it is unclear why a generic 7 year payback policy should automatically preclude the adoption of this technology. Massachusetts is a national leader in greenhouse gas reduction initiatives, as recent legislation demonstrates, and Lowes has an opportunity with this project to make leadership statement and take advantage of the variety of gains that early action in a transition period may yield.

There are discrepancies in the stationary source quantification analysis which render its conclusions questionable. For example, the 2012 Build with Mitigation case for stationary sources is the same in the EENF and Single EIR (1,053.2 tpy), despite claiming in the narrative that it has committed to and modeled the impact of more mitigation. Due to the above, the increased difference between the 2012 Build and the 2012 Build with Mitigation for stationary sources in the Single EIR (140.3 tpy reduction compared to a 68.7 tpy reduction) isn't due to any

additional mitigation or improvements in the modeling, but just because the 2012 Build case in the Single EIR is 71.5 tons greater than the 2012 Build in the EENF. The calculation of percentage reductions also is inaccurate. As reasonably accurate measurement is a core function of the policy, these errors warrant correction if a subsequent filing is required. Even with the revised calculations, the net reduction in on-site stationary source related emissions is anemic. But there are venues for Lowes to look off-site for local municipal or regional energy efficiency targets which, with a combination of technical and/or financial assistance, will yield significant $C0_2$ reductions that will be associated with Lowes in general and this development in particular.

The Department also acknowledges the potential for additional future reduction as a result of implementation of the LEADS program. It would be beneficial if the program included the voluntary collection of information from employees who implement energy savings practices outside of work as a result of the in-store educational program as a way to gauge and quantify the potential multiplier effect of this type of initiative. This program appears to combine the benefits of post-construction commissioning to ensure the equipment is operating according to its specifications, but for continuous quality improvement as well. The fact that it is not subject to refined quantification should not exclude it from being considered a valid mitigation measure.

The Department of Energy Resources has also reviewed the Single EIR and acknowledges the Greenhouse Gas mitigation measures identified for stationary sources. The EIR generally addresses the comments previously provided by the Commonwealth and identifies some additional measures beyond those comments. As noted above, a recalculation is required to accurately determine what the net effect of those measures will yield. As the project moves forward, DOER recommends that the project proponent contact the New Construction division of its electric utility provider, National Grid, and its natural gas provider, Berkshire Gas, to take advantage of any potential rebates available for the installation of highly energy efficient equipment.

DOER offers the following specific comments on the mitigation measures identified:

HVAC/Heating systems - The EIR identifies the installation of an Energy Star compliant HVAC system of EER 11.5 and a heating furnace with an 81% efficiency. The project proponent is encouraged to install the most efficient systems possible. Although there is a potential for additional first costs with more efficient systems, more efficient units provide definite economic benefits over the life of the system.

Interior Lighting – The EIR identifies that high efficiency fluorescent lighting will be installed throughout the building interior. This lighting should be Super T8 or T5 fluorescent lighting, which exceeds the baseline code requirement for T8s.

Insulation – The EIR notes that additional insulation (R-value of 18.4) will be installed in the roof to minimize thermal loss. The project proponent is encouraged to install the highest R-value of insulation possible. In general, insulation is very cost effective, and contributes significantly towards a building envelope with the potential to yield the largest energy savings for building operations.

Lowe's Energy Awareness Delivers Savings (LEADS) Program – The LEADS program has impressive potential as summarized in the SFEIR. Providing additional information, such as how it has been implemented and the results from other stores would be provide valuable information, a firmer basis to project its potential benefits at this location, and an opportunity for the agencies to provide constructive comments. For example, it would be useful if the program were able to collect data to compare actual results with anticipated energy reductions from implemented energy efficiency measures. Also, if the different stores receive some type of "report card" on their performance it may produce better results in employee behavior, especially if they are "competing" or compared to other stores.

Solar Photovoltaic (PV) – The project proponent stated that an expected payback for a potential 50 kW solar PV system of 7 years is beyond the guidelines for the Lowe's Companies rate of return. The absence of a robust financial analysis documenting the payback assessment precludes the agencies from constructively critiquing the model's inputs or assumptions, a opportunity that might yield a different outcome. The analysis also looks only at ownership of the units rather than a third party provider of the technology that could covert short term capital costs into an operating expense. Given the anticipated reduction in payback of solar PV in light of technological advances, the availability of financial incentives and increasing cost trend for electricity, the company's traditional payback perspective may be too narrow. While a detailed financial analysis is not required for every mitigation component not adopted, given Lowe's long term ownership of the development, the relatively short pay-back period, and the likelihood that the PV cost structure will improve in the near term, a more substantial justification is warranted where perhaps short-sighted design and construction decisions could be made that create barriers to adopting the technology at a later date. At a minimum the building should be constructed so the roof can support the added weight of a solar PV system and the project proponent should commit to continue to consider the option for solar PV in the future.

The SEIR makes very limited mention of the other retail property on the project site, which it appears Lowe's is developing and plans to lease. Most, if not all of the energy efficiency design and construction measures incorporated in the Lowe's store are applicable to the other retail establishment, and as the developer it would seem that Lowe's could set the design and construction standards for that project as well. The same economic reasons that motivate Lowe's to make the investment in energy efficiency will make the property more marketable and send a consistent message to customers of both stores. There are "green" lease arrangements that would also share the energy savings benefits between the tenant and developer to make the payback equitable. We recommend that the Certificate require Lowe's to incorporate basic energy efficiency mitigation measures for the lighting, insulation and HVAC components in the other buildings on the site.

Mobile Source Emissions

Mesoscale Analysis

The proposed project site, located on Route 8 in North Adams, contains a 155,130 square feet home retail center, retail store, and a drive-thru bank. The proposed development is projected to generate approximately 5,550 new average daily weekday trips (ADT) and 7,350 new Saturday trips.

The EENF mesoscale analysis evaluated the mobile source emissions for the following scenarios: 2007 Existing, 2012 No Build, 2012 Build, and 2012 Build with Improvement conditions. The mesoscale analysis of No Build and Build conditions determined that the proposed project would increase volatile organic compounds (VOCs) and nitrogen oxides (NOx) emissions and required the proponent to identify mitigation measures in the SEIR. The SEIR identified several roadway modifications to improve traffic flow within the project area and Transportation Demand Management (TDM) measures to further reduce project generated emissions through trip reduction. The TDM measures were not quantified, but are recommended due to their potential to reduce trip generation. The mesoscale analysis predicted VOC and NOx emissions using the current US EPA emission model (MOBILE 6.2) and traffic flow conditions for the respective development scenarios.

The results of the analysis estimate that the proposed project 2012 Build condition will increase VOC and NOx emissions by 5.5 kg/day and 9.6 kg/day respectively when compared to the No Build condition. The analysis also estimates that the recommended mitigation results in a reduction of VOC and NOx emissions by 0.2 kg/day and 0.1 kg/day respectively.

Greenhouse Gas

The mesoscale analysis described above is also used to estimate the mobile source emissions of CO2 associated with the additional project related vehicle trips. The analysis results (Table 3.1) estimates the CO2 emissions for the 2012 No Build condition to be 29,796 tpy compared with an estimated 33,856 tpy produced by the 2012 Build condition. The Build with Improvement condition results in an estimated 33,814 tpy or a 41.6 tpy decrease over the Build condition. The total proposed mitigation results in a 1% reduction of the estimated 4,118 tpy increase of mobile source CO2 emissions associated with the project.

The GHG impacts from the development are far more significant from mobile sources than from the stationary power sources. At the same time, mobile sources are less tractable to mitigation measures because the means to achieve substantial reductions often lie outside the direct control of the developer. The areas addressed SEIR lie within the traditional ambit of the developer's control or influence, but in several instances the scope of the mitigation measures could be feasibly expanded.

While this may not have been the proponent's intent, the scope of the Ridesharing program commitment described in the EENF (4-24) is more robust than the more limited commitments made in the SEIR (4-7). At a minimum, the full program described in the EENF should be adopted in the SEIR. Having made a commitment to ridesharing, MassDEP strongly encourages that the proponent also incorporate several relatively low cost rideshare incentives that will increase participation and demonstrate to employees that the company strongly supports the program. These include:

- an emergency ride home program for all project employees who travel by carpools/vanpools.

- a transportation tax benefit program to encourage employees to take transit or vanpools to work. This program provides the added benefit of decreasing taxes for employers and employees.

MassDEP supports the proponent's participation in SmartWay as a means of producing fewer delivery truck trips producing fewer and more efficient site based trucking. However, although measurable CO2 reductions are achieved with SmartWay, MassDEP notes that delivery truck traffic volumes account for almost negligible trips when compared to site generated automobile trips.

The proponent has committed to provide bike racks to promote that form of transportation for employees and customers. Those racks should be located out of the weather. The SEIR also indicates it provides on site amenities to employees that reduce off site trips. If the proponent does not already provide a shower or lockers in the employees' areas, the Department's experience is that having those facilities can very cost effectively increases participation.

An important component of the proponent's TDM measures is increasing access to the Berkshire Regional Transit Authority (BRTA bus) by constructing a bus shelter and related pedestrian access. A corresponding low cost financial incentive would be to offer some subsidy for transit passes to employees who regularly travel by bus. This incentive could part of the larger issue raised by the Berkshire Regional Planning Commission and the Secretary's Certificate to address transit pricing ($1.10 surcharge) across municipal boundaries. The proponent should commit to follow through on discussions with BRTA to revise the pricing once the construction is completed.

Regarding mobile GHG reductions from the other retailers on the site, the proponent limits its commitment to encouraging tenants to provide staggered hours and offer direct deposits. Extending the opportunity for tenant's employees to participate in the unfunded aspects of the Lowe's ridesharing plan could expand opportunities for all involved without additional cost to Lowes. More concretely, as the developer, Lowe's should through its construction agreement and lease with the tenant require the same commitments to reduce diesel emissions and prevent truck idling.

The draft Section 61 Findings are limited to the transportation elements of the GHG reduction measures. That limitation is understandable given the traditional relationship between the permitting agency's jurisdiction and the Findings. However, this leaves the bulk of the mitigation commitments confined within MEPA. Moreover, the nature of these mitigation measures detailed in the SEIR do not lend themselves to implementation through permit conditions integrating Section 61 Findings and post construction compliance inspections. It is crucial, however, to secure the non-traditional benefits intended by the Policy that the commitments be followed through and the C02 reduction benefits they represent be quantified. One potential solution to these limitations is for the Secretary's Certificate to obligate the proponent to submit a post construction statement by the appropriate senior manager of the developer, or its authorized designee, certifying that the GHG reduction commitments presented in the final Environmental Report and as may be supplemented by the Secretary's Certificate have been implemented.

We have reviewed the Greenhouse Gas analysis presented in the EENF and SEIR for the North Adams project and want to provide you with responses to the questions you ask at our meeting last week.

Comment 1: Clarification was requested on why the Stationary Source CO2 emissions for Existing and 2012 No-Build Conditions differed between the EENF and SEIR. (730.9 vs. 686.6 tons per year- see Tables 3-1 and Table 5-3 below.

Response: The reason that the EENF and SEIR CO2 emissions for Existing and 2012 No-Build differ is that the EQUEST model was revised from the EENF to reflect updated weather information. During the time between the submission of the EENF and the SEIR, we became aware of EQUEST ability to customize the weather information for an area. The EENF contained weather for Boston and the SEIR analysis was updated to Stockbridge (which is closer to North Adams). This weather update accounts for the difference in the CO2 emissions for Existing and 2012 No-Build Conditions. It should be noted that this weather update is carried through ALL of the conditions including the Build and Build with improvements.

Comment 2: Clarification was requested on why the Stationary Source CO2 emissions for Build with Improvements Condition were approximately the same for the EENF (1053.3 Tons per year) and the SEIR (1053.2 Tons per year) even though additional mitigation was proposed in the SEIR.

Response: It is only by chance that these numbers are very close. The actual EQUEST results are, in fact, different (see the following bullets). The following bullets present the actual numbers in more detail:

- EENF EQUEST model (2012 Build with BUILDING Mitigation Conditions) CO2 emissions = 1053.3 Tons per year
- SEIR EQUEST model (2012 Build with BUILDING Mitigation Conditions) CO2 emissions = 1076.4 Tons per year (which includes the original mitigation measures as well as the weather update (see comment 1)

As a result of identifying additional GHG mitigation measures, the SEIR building mitigation number (1076.4 Tons per year) was reduced by 23.2 Tons per year for the Green Power Purchase and Lowes Energy Management Programs resulting in the 2012 Build with BUILDING Mitigation Conditions of 1053.2 Tons per year, which by pure coincidence is almost equal to the EENF value. The SEIR demonstrates that the GHG mitigation reductions (140.3 Tons per year) are greater than the reductions (68.7 Tons per year) in the EENF due to the updated GHG analysis and additional mitigation measures.

Comment 3: Clarification was requested on the 11.8% percent of Stationary Source GHG reduction that was presented in the SEIR.

Response: We believe that this percent should represent the amount of the GHG reductions due to all the mitigation measures divided by the amount of the GHG emissions generated by the project. This represents the percent reduction that was realized from the proposed Greenhouse Gas mitigation that was presented in the SEIR. The 11.8% is the percent reduction of GHG emissions from the Full Build conditions (without mitigation) to the Full Build with mitigation. Note that this percent is greater for the SEIR than the EENF due to the additional GHG mitigation measures.

This equates to: (2012 Build) minus (2012 Build with Mitigation) divided by (2012 Build)

$$\frac{(1{,}193.5-1{,}053.2)}{1{,}193.5} = \frac{140.3}{1{,}193.5} = 11.8\%$$

Comment 4: Clarification was requested on the TDM GHG mitigation results.

Response: The mobile source GHG reductions presented in the EENF were based upon the physical benefits of the roadway improvements. The mobile source GHG reductions presented in the SEIR represent the physical benefits, reductions calculated based upon the EPA's COMMUTER model, and emission reductions from the Smartway program. Attached is the results sheet for the COMMUTER model that documents a 1% reduction due to the TDM.

Table 3-1 (From the SEIR)
CO2 Analysis Results*

	2007 Existing Condition	2012 No-Build Condition	2012 Full Build Condition[1]	2012 Difference of Full Build vs. No-Build	2012 Full Build w/ Improvements Condition[2]	2012 Difference of Full Build vs. Full Build with Improvements
Mobile Source Analysis	27,783.9	29,796.0	33,855.5	4,059.5	33,813.9	-41.6
Direct /Indirect Stationary Source	730.9	730.9	1,193.5	440.5	1,053.2	-140.3
Total	28,514.8	30,526.9	35,049.0	4,500.0	34,867.1	-182.0

Notes: *Tons per Year
[1] Full Build Condition = Code Compliant
[2] The proposed improvements are described in detail below.

Table 5-3 (From the Expanded ENF)
CO2 Analysis Results with Mitigation Condition*

GHG Analysis	2007 Existing Condition	2012 No-Build Condition	2012 Build Condition	2012 Build/ No-Build Difference	2012 Build w/ Improvements Condition	2012 Build with Improvements/ Build Difference
Mobile Source Analysis	27,783.9	29,796.0	33,855.5	4,059.5	33,837.7	-17.8
Direct /Indirect Stationary Source	686.8	686.8	1122.0	435.2	1,053.3	-68.7
Total	28,470.7	30,482.8	34,977.5	4,494.7	34,891.0	-86.5

*Tons per Year

COMMUTER MODEL RESULTS

SCENARIO INFORMATION

Description	Lowes North Adams2
Scenario Filename	lowes-nadams2.vme
Emission Factor File	
Performing Agency	VHB
Analyst	Robert Ricchi
Metropolitan Area	North Adams, MA
Area Size	3 - Small (under 750,000)
Analysis Scope	2 - Site or Employer-Based
Analysis Area/Site	shopping center
Total Employment	175

PROGRAMS EVALUATED

X	Site Walk Access Improvements
X	Transit Service Improvements
	Financial Incentives
X	Employer Support Programs
	Alternative Work Schedules

	User-Supplied Final Mode Shares

MODE SHARE IMPACTS

Mode	Baseline	Final	%Change
Drive Alone	78.2%	77.2%	-1.0%
Carpool	12.1%	12.5%	+0.4%
Vanpool	0.5%	0.5%	-0.0%
Transit	4.9%	5.3%	+0.5%
Bicycle	0.4%	0.5%	+0.1%
Pedestrian	3.0%	3.1%	+0.1%
Other	0.8%	0.8%	-0.0%
No Trip	-	0.0%	+0.0%
Total	100.0%	100.0%	-

Shifted from Peak to Off-Peak	0.0%

TRAVEL IMPACTS (relative to affected employment)

Quantity	Peak	Off-Peak	Total
Baseline VMT	2,257	1,419	3,676
Final VMT	2,238	1,407	3,646
VMT Reduction	19	12	30
% VMT Reduction	0.8%	0.8%	0.8%
Baseline Trips	180	113	293
Final Trips	178	112	290
Trip Reduction	2	1	3
% Trip Reduction	1.0%	1.0%	1.0%

North Adams #1/4/80
Single EIR

3 Air Quality

Introduction

This chapter presents the updated air quality study conducted for the Project located in North Adams, Massachusetts as described in Chapter 1, *Project Summary*. The air quality study of the January 2008 Expanded ENF included an analysis of the ozone precursor emissions (mesoscale analysis) as well as the Greenhouse Gas (GHG) mobile and stationary source emissions, including an evaluation of the mitigation measures developed to reduce these emissions.

The Secretary's MEPA Certificate, dated March 14, 2008, requested that the Proponent clarify the GHG mitigation measures, the emission calculations and documentation, and identify potential additional mitigation measures. The purpose of this section is to respond to the Secretary's Certificate and update the Project's GHG emissions analysis and commitment to specific mitigation measures (i.e., sustainable design measures the directly correlate to the reduction of GHG emissions. Chapter 1 provides an overview of all the sustainable elements incorporated into the Project).

Summary of Mesoscale Analysis

The Expanded ENF mesoscale analysis evaluated the change in emissions from Project-related traffic for the 2007 Existing, the 2012 No-Build, and the 2012 Build Conditions, and the 2012 Build with Mitigation Conditions. The mesoscale analysis demonstrates that the proposed Project meets the DEP air quality criteria. The following is a summary of the results. Under the Build Condition, the VOC emissions were estimated to increase by 5.5 kg/day and the NOx emissions by 9.6 kg/day from the No-Build Condition. With the recommended mitigation measures, the volatile organic compounds (VOC) and oxides of nitrogen (NOx) emissions are estimated to be reduced by 0.2 kg/day and 0.1 kg/day, respectively, from the 2012 Build Conditions. The analysis of Project-related impacts indicates that with the implementation of improvements, the additional site-generated traffic associated with the Project will not have an adverse impact on the majority of intersection traffic operations. Additionally, the proposed Transportation Demand Management (TDM) program measures are expected to reduce the VOC and NOx emissions associated

with the Project, therefore, demonstrating compliance with the transportation conformity criteria.

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Summary of Greenhouse Gas Emissions Analysis

The air quality study of the Expanded ENF calculated GHG emissions from mobile and stationary sources. The mobile source emissions were calculated by performing a yearly GHG emissions mesoscale analysis to evaluate the changes in CO2 emissions for the existing and future conditions within the study area. Similar to the mesoscale analysis for ozone, the year 2012 was selected as the future year of analysis because MEPA's policy requires that a project look five years into the future from the current year of analysis. The mobile source analysis traffic (volumes, delays, and speeds) and emission factor data were developed for four conditions, 2007 Existing, the 2012 No Build, the 2012 Build, the 2012 Build with improvements conditions. In addition to mobile sources, direct and indirect CO2 emissions from the Project's proposed building sources were calculated using the computer-based EQUEST model[1]. Direct emissions included those emissions from the facility itself such as boilers, heaters, and internal combustion engines. Indirect emissions included CO2 emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Total CO2 emissions were determined by combining the CO2 results from the mobile source analysis with the CO2 emissions from the proposed direct and indirect building sources.

The updated GHG emissions analysis herein evaluates the change in CO2 emissions from Project-related traffic and proposed building sources (or stationary sources) for the 2007 Existing, the 2012 No-Build, the 2012 Build, and the 2012 Build with Improvements Conditions. Under the 2007 Build Condition, the CO2 emissions were estimated to increase by 4,500.0 tons/year from the 2012 No-Build Condition. However, with the recommended mitigation measures, and improvement measures associated with the proposed building systems, the CO2 emissions are estimated to be reduced by 182.0 tons/year from the 2012 Build Condition. The GHG emissions analysis demonstrates that the Project meets the *MEPA Greenhouse Gas Emissions Policy and Protocol*. The Project will include mobile and stationary source mitigation measures that will result in reduced GHG emissions for the 2012 Build with Improvements Condition.

Greenhouse Gas Emissions Analysis

The Executive Office of Energy and Environmental Affairs (EEA) has recently developed and issued a policy that requires project proponents to identify and

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1 EQUEST (the Quick Energy Simulation Tool), version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA

describe the feasible measures to minimize GHG emissions. The Policy requires that projects undergoing review by the MEPA Office at the EIR level and meeting specific criteria (e.g., generation of 3,000 or more vehicle trips per day) to quantify the Project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying project-related GHG emissions, the Policy also requires proponents to quantify the impact of proposed mitigation in terms of emissions and energy savings. The goal of the Policy is to identify measures to reduce or minimize the GHG emissions. While GHG emissions include several gases, Carbon Dioxide (CO2) was selected for evaluation because it is the most significant component of project-related GHG emissions.

Mobile Source Methodology

The GHG mobile source analysis was conducted following procedures similar to the ozone mesoscale analysis. The mobile source analysis estimated the area wide CO2 emissions from vehicle traffic for a time period of one year. The change in CO2 emissions from traffic were based on the average yearly traffic volumes, roadway lengths and vehicle emissions factors for existing and new trips for weekday and weekend conditions. The GHG analysis also calculated the changes in CO2 emissions due to the roadway mitigation measures and TDM program using the EPA's COMMUTER[2] model Version 2. Mobile source GHG emissions are based upon the traffic volumes, the distance traveled and the GHG emission rate (in grams per vehicle mile traveled). The COMMUTER model evaluates the study area and the proposed Project to identify measures that would reduce or eliminate vehicle trips and GHG emissions. These measures include:

- Transit fare decreases or other incentives that reduce the cost of using transit;
- Transit service improvements (faster or more frequent service);
- Ridesharing programs, in which employers support carpooling and/or vanpooling through on-site programs, financial incentives, or preferential parking;
- Other actions, such as increased parking charges or cash-out programs, that change the time and/or cost of traveling by any particular mode;
- Non-motorized (e.g., bicycle and pedestrian) commuting programs;
- Alternative work schedules, including flex-time, compressed work weeks, and staggered work hours; and
- Telecommuting.

[2] COMMUTER, version 2.0 release from EPA (U.S. Environmental Protection Agency)

Mobile Source Emission Rates

Currently MOBILE6.2 has a simple estimate of CO2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts specific conditions. A detailed presentation of the MOBILE6.2 input and output data are presented in Appendix D.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mobile source analysis for CO2 emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The traffic data used in the air quality study are presented in Appendix D. The detailed traffic analysis is presented in Chapter 4, *Transportation* of the January 2008 Expanded ENF.

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Stationary Source Methodology

The Project would generate GHG emissions thru the use of electricity and fossil fuels. The stationary source analysis calculated project-related CO2 emissions from these building sources using the computer-based EQUEST model. These building sources included boilers, heaters and internal combustion engines. While the proposed Project is in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. The stationary source analysis calculated GHG emissions for two conditions, the 2012 Build, the 2012 Build with Improvements Conditions. The 2012 Build Condition represents the stationary source emissions that would occur if the proposed Project were to be built using typical construction materials and rooftop equipment. The 2012 Build with Improvements Condition represents the Project-related emissions based upon the use of improved building materials and rooftop equipment.

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Existing Air Quality (GHG)

EPA has not set NAAQS for GHGs; however, they do encourage strategies to reduce emissions and save fuel. The calculation of 2007 Existing Condition emissions provides a base for which future years can be evaluated.

Existing Mobile Source Emissions

The mobile source analysis calculated the 2007 Existing Condition CO2 emissions from the major roadways in the study area. These emissions, estimated to be 27,783.9 tons/year, establish a baseline to which future emissions can be compared. Table 3-1 below presents the existing CO2 analysis results for existing conditions.

Existing Stationary Source Analysis

The GHG analysis calculated the 2007 Existing Condition CO2 emissions for direct and indirect emissions from the existing stationary sources. Under the 2007 Existing Condition, the CO2 emissions were estimated to be 730.9 tons per year, establishing a baseline to which future emission can be compared (Table 3-1).

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Project-Related Impacts

Future Project-related emission calculations are based upon changes in traffic and emission factor data as well as the proposed Project's building sources. The traffic data include traffic volumes, vehicle-miles-of-travel, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The Project's building sources included direct emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following section reports the findings of the mobile source and stationary source analyses for the Project.

Future Mobile Source Emissions (GHG)

The mobile source analysis estimated the future study area CO2 emissions due to the changes in traffic and emission data. Under the 2012 No-Build Condition, CO2 emissions were estimated to be 29,796.0 tons per year (Table 3-1). Under the 2012 Build Condition, the CO2 emissions were estimated to be 33,855.5 tons per year (Table 3-1). Finally, under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 33,813.9 tons per year (Table 3-1). This results in a decrease of 41.6 tons per year in CO2 emissions as compared to the 2012 Build Condition. This reduction is due to the signal timing improvements of the study area roadways.

Future Stationary Source Emissions (GHG)

The stationary source analysis calculated 2012 Build and 2012 Build with Improvements Conditions CO2 emissions for direct and indirect emissions from stationary sources. Direct emissions included those from stationary sources such as

boilers, heaters and internal combustion engines. Indirect emissions included those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems.

Under the 2012 Build Condition, the CO2 emissions were estimated to be 1,193.5 tons per year (Table 3-1). Under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 1,053.2 tons per year (Table 3-1). This results in a decrease of 140.3 tons per year or 11.8 percent in CO2 emissions as compared to the 2012 Build Condition. (Reductions are because of the building mitigation measures discussed in the 'Proposed Project Improvements' section below.)

Table 3-1 below presents CO2 emissions from mobile and direct and indirect stationary sources under all conditions.

Table 3-1
CO2 Analysis Results*

	2007 Existing Condition	2012 No-Build Condition	2012 Full Build Condition[1]	2012 Difference of Full Build vs. No-Build	2012 Full Build w/ Improvements Condition[2]	2012 Difference of Full Build vs. Full Build with Improvements
Mobile Source Analysis	27,783.9	29,796.0	33,855.5	4,059.5	33,813.9	-41.6
Direct /Indirect Stationary Source	730.9	730.9	1,193.5	440.5	1,053.2	-140.3
Total	28,514.8	30,526.9	35,049.0	4,500.0	34,867.1	-182.0

Notes: *Tons per Year
[1] Full Build Condition = Code Compliant
[2] The proposed improvements are described in detail below.

The Secretary's MEPA Certificate on the Expanded ENF requested that the Project evaluate and include additional GHG mitigation measures. The Proponent has provided a list and a discussion of additional GHG mitigation measures (presented in sections 'Proposed Project Improvements' and 'Additional Project Improvements' below). The results in Table 3-1 above reflect this update. The addition of TDM and the SmartWay Transport Partnership for delivery trucks has increased the reduction in mobile source GHG emissions from an estimated 0.05 percent from the Expanded ENF to 0.12 percent in the updated analysis. The addition of the combination of the Energy Star Partnership, Green Power Purchasing Program, and Lowe's Greenhouse Gas Awareness Program has increased the reduction in stationary source GHG emissions from an estimated 6.1 percent in the Expanded ENF to 11.8 percent in this updated analysis.

Proposed Project Improvements

The Proponent has developed both physical and operational mitigation energy efficient measures to be included in the Project. The following presents those mitigation measures evaluated in the GHG analysis/model.

Mobile Sources

As presented in the Expanded ENF and in Chapter 4, *Mitigation and Benefits*, the Proponent will implement roadway improvements, including modifications to signal phasing and timing plan to increase capacities and reduce delays of the intersection. Additionally, a TDM program will be implemented as part of the Project in an effort to reduce Project-generated vehicle trips and to minimize peak-period traffic demands in the study area. The implementation of the TDM program is expected to improve air quality in the study area by increasing the number of persons in a vehicle, and promoting the use of alternative modes of travel. The Proponent has committed to the following TDM measures:

- Facilitate bicycle and pedestrian travel by providing bicycle racks, sidewalks and signalized pedestrian crosswalks;
- Provide improved access from the Project to transit, specifically to the Berkshire Regional Transit Authority (BRTA) bus services to encourage use of alternative transportation;
- Encourage tenants to provide staggered work hours;
- Encourage tenants to offer direct deposit to their employees;
- Provide preferential carpool and vanpool parking within the parking lots as a convenience to participants and to promote ridesharing; and
- Provide on-site services such as on-site break rooms with refrigerators, ATMs/banking services, etc. to reduce the need for employees to leave the center.

The detailed TDM measures and discussions are presented in Chapter 4, *Mitigation and Benefits*.

The Proponent will implement an additional, non-traditional TDM measure - the SmartWay Transport Partnership for delivery trucks, which aims to reduce trips and provide for more fuel efficient trucking operations. Refer to the 'Additional Project Improvements' section below for further details.

Stationary Sources

The Proponent will also implement specific building design and operation measures in an effort to reduce GHG emissions. The following are the mitigation measures

(and their correlating EQUEST modeling parameters for reference where applicable) that will be included in the Project:

- High-efficiency Energy Star-compliant packaged HVAC systems (EER 11.5)
- Double Low-E glass windows to minimize heat loss
- Motion sensors and lighting in the office space in the building to reduce energy consumption (Approximately 5 percent reduction of office lighting)
- Additional insulation will be added to the roof to minimize heat loss (R-value of 18.4)
- White colored thermoplastic olefin (TPO) membrane roofing to reduce heat island effect on rooftop
- Partial skylights at the garden center to reduce electrical usage
- Purchase Green Power (accounting for approximately 2 percent of total energy consumption)

Additional Project Improvements

The Proponent will implement additional energy consumption/GHG-reducing programs that also reduce mobile and stationary sources (some GHG emissions reductions are estimates only as they cannot be modeled as part of EQUEST). The following is a list and description of these measures:

- Lowe's SmartWay Transport Partnership Program
- Green Power Purchasing Program
- Lowe's Energy Management Program
- Energy Star Partnership
- Lowe's Energy Awareness Delivers Savings (LEADS)

Lowe's Energy Consumption/Greenhouse Gas Related Programs

In effort to reduce greenhouse gas emissions, Lowe's has also introduced several GHG awareness programs design to reduce energy usage.

Lowe's SmartWay Transport Partnership Program

Lowe's currently implements a program to reduce energy usage of their trucking operations through the SmartWay Transport Partnership with the U.S. Environmental Protection Agency (EPA), which is an innovative collaboration

between EPA and the freight industry to increase energy efficiency while significantly reducing greenhouse gases and air pollution. There are three primary components of this program:

- creating partnerships,
- reducing all unnecessary engine idling, and
- increasing the efficiency and use of rail and intermodal operations.

A preliminary estimate of the mobile source GHG emission reductions due to this program activity is 11.2 tons per year.

Green Power Purchasing Program

Lowe's purchases green power that is generated from renewable resources such as solar, wind, geothermal, biomass and biogas, as well as low-impact hydropower. Lowe's allocates two percent of green power purchasing credit to each store. A preliminary estimate of the stationary source GHG emission reductions due to the use of Green Power is 18.0 tons per year.

Lowe's Energy Management Program

Lowe's currently implements and energy management system to reduce energy usage at each of their stores. This program includes:

- Operating the sales floor lights using a computer program coordinated to their operating hours
- Setting display lights to shut off 15 minutes after store closing
- Use of photo sensors and store operating hours to control Garden Center lights turning them on only when needed
- Use of photo sensors and store operating hours to control store signs, parking lot lights, and security lights.

A preliminary estimate of the stationary source GHG emission reductions due to this program activity is 4.4 tons per year.

Energy Star Partnership

Lowe's has been recognized by the EPA and the Department of Energy for its efforts to protect for the environment. Since 2001, Lowe's have been raising awareness of energy efficient products and projects for homeowners by promoting new products such as the use of compact fluorescent light bulbs and new energy efficient technologies. Lowe's is qualified for the EPA Retail Partnership Program and was named the "Energy Star Retail Partner of the Year" by the US EPA in 2005 for the third consecutive year. A variety of Energy Star products are available at Lowe's, these products ranges from fans, dishwashers, lighting units, programmable thermostats to sealing and insulation products.

Lowe's Energy Awareness Delivers Savings (LEADS)

Lowe's has introduced an energy awareness program to all their employees in effort to reduce greenhouse gas emissions and water waste. Under the energy awareness program, Lowe's will distribute a checklist to every store which includes items of energy consuming opportunities, which will then be reported and translated into energy reduction results. Participating stores will be provided with LEADS energy savings documents, including a checklist, educational materials, factoids and associated reports. Each participating store will determine the electrical and water maintenance issues and report any energy anomalies on-site. A complete energy and water consumption analysis will be performed and baseline consumptions and trends of each store will be recorded to monitor the progress of the program success.

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Alternative Project Improvements

MEPA's GHG Policy calls for providing data for an alternative that result in greater GHG reductions than the preferred alternative. As demonstrated above, Lowe's is committed to reducing electrical usage at the Project. Lowe's is also currently testing Photo-voltaic (PV) demonstration projects in California and Hawaii, and is gathering information on energy performance and operating costs. Solar insulation is more plentiful in those states than in New England, and the use of PV cells will be more efficient. In the near future, Lowe's will have specific life cost data to evaluate whether PV systems are feasible for store design at other locations in the country.

The facility the size of the proposed Project could use a 50 kW solar PV system. In Massachusetts, a 50 kW solar PV installation will generate approximately 5,180 kWh per month, which equates to approximately 34.4 tons per year in GHG emissions reductions. The installed cost of the system is $7 to $9 per rated Watt, which gives a cost range of $350,000 to $450,000. Despite the state rebates such as the Massachusetts Commonwealth Solar Program and the state and federal tax incentives, the payback period on a solar PV system of this size is about seven years. This payback period is longer than the guidelines for the Lowe's Companies rate of return, which makes a solar PV system impracticable for the Project at this time.

The GHG emissions reductions for the Project calculated using EQUEST, which focuses on mobile sources and direct and indirect stationary sources. While the Project does include energy reduction programs, the promotion of products to reduce energy use, and efficient store operation; additional solar, wind, and geothermal measures were determined to not be feasible for because of one or more of the following reasons:

- Inappropriate fit for the Project location;
- The technology is not advanced for the building type; and

- The alternatives are cost-prohibitive for a project of this scale, due to the projected rate of return.

Conclusion

The air quality study demonstrates that the Project complies with the Clean Air Act Amendments (CAAA), the State Implementation Plan (SIP), and the Executive Office of Energy and Environmental Affairs (EEA) policy on Greenhouse Gas emissions. The ozone mesoscale analysis demonstrates that the Project will result in an increase of VOC and NOx emissions, as compared to the No-Build Condition.

Consistent with the guidelines of the Massachusetts Department of Environmental Protection (DEP), the Project will incorporate reasonable and feasible mitigation measures to reduce VOC and NOx emissions. These mitigation measures include roadway improvements, traffic signal improvements and a TDM program. The implementation of these mitigation measures will help reduce the VOC and NOx emissions associated with the Project. The GHG emissions analysis demonstrates that the Project meets the EEA draft policy on GHG emissions because it includes mobile and stationary source mitigation measures that will reduce the GHG emissions from levels expected from a project without mitigation.

The air quality study demonstrates that the Project conforms to the CAAA, the SIP, and EEA GHG policy because:

- It will implement reasonable and feasible emission reduction mitigation measures;
- No new violation of the NAAQS will be created;
- No increase in the frequency or severity of any existing violations will occur; and
- No delay in attainment of any NAAQS will result.

will also be provided across the southerly and easterly legs of the Route 8/Site Driveway intersection. The crossing will accommodate pedestrians using the BRTA system in either the northbound or southbound directions.

Air Quality

The following measures are proposed in order to reduce air quality impacts related to both mobile and stationary sources.

Mobile Sources

As discussed above in the 'Transportation' section, the Proponent will implement signal improvements to the roadways to reduce delays and queing, as part of the Project in order to minimize peak-period traffic demands in the study area. The mesoscale analysis calculated the changes in VOC and NOx emissions due to the roadway mitigation. The results of the mesoscale analysis demonstrate that the roadway improvements will meet the transportation conformity criteria by reducing both VOC and NOx emissions. The Proponent will also implement a TDM program as part of the Project in order to reduce Project-generated vehicle trips and to minimize peak-period traffic demands in the study area. While the mesoscale analysis does not quantify the emission reductions from proposed TDM mitigation measures, their implementation is expected to result in additional improvements to air quality in the study area.

Also discussed above, the Proponent will implement a number of TDM measures will be provided by the Proponent to further reduce peak employee traffic demand on the roadway system and encourage alternative transportation modes for serving the on-site retail customers. The detailed TDM measures and discussions were presented in Chapter 4, *Transportation* of the Expanded ENF.

The GHG policy encourages project proponents to identify and quantify measures that would reduce or minimize GHG emissions from mobile sources and direct and indirect stationary sources (discussed below). As discussed above, the Proponent has developed physical and operational mitigation measures to be included in the Project.

Stationary Sources

In compliance with the GHG Policy, the Proponent is committed to implementing the following specific building improvements related to energy efficiency:

- High-efficiency Energy Star-compliant packaged HVAC systems;

- Double Low-E glass windows to minimize heat loss;
- Motion sensors and lighting in the office space in the building to reduce energy consumption (approximately 5 percent reduction of office lighting);
- Additional insulation will be added to the roof to minimize heat loss (R-value of 18.4);
- White colored thermoplastic olefin (TPO) membrane roofing to reduce heat island effect on rooftop;
- Partial skylights at the garden center to reduce electrical usage; and
- Purchase Green Power (accounting for approximately 2 percent of total energy consumption).

In addition to site/building-specific measures, the Proponent is committed to reducing GHG emissions corporate-wide by implementing the following programs:

- Lowe's Energy Awareness Delivers Savings (LEADS);
- Energy Star-qualified products;
- Green Power Purchasing Partnership; and
- Smart Way Transport Partnership.

Refer to Chapter 4, *Air Quality – Greenhouse Gas Emissions Analysis* for the GHG emissions modeling approach and results (reductions in GHG emissions due to improvements).

Construction Management

The potential temporary impacts due to construction activities are typically related to noise, dust/air quality, soil erosion and sediment control, and truck traffic. As presented in Chapter 6, *Construction Period Impacts* of the Expanded ENF, these impacts will be minimized through a Construction Management Plan. Generally, measures to reduce construction period impacts include controlling erosion and sedimentation, controlling dust, machinery air emissions, and noise, properly managing construction-related truck traffic on Route 8.

Chapter 6, *Construction Period Impacts* of the Expanded ENF included discussion on construction debris and recycling. All construction debris will be handled, managed, and disposed of in accordance with applicable regulations. A licensed waste management contractor will be retained to transport all debris to an approved landfill/disposal facility or reclamation facility. It is anticipated that a majority of the existing steel and concrete will be recycled and that all paving removal will be trucked to an appropriate facility for recycling and reuse.

Mobile Source Results – CO2 Emissions

North Adams Plaza Redevelopment - North Adams, MA

Pollutant	Annual Total CO_2 Emissions Inventory in Tons per Year 2007 Existing Condition	2012 No-Build Alternative	2012 Build Alternative	2012 Build Alternative With Mitigation
Carbon Dioxide	27,783.9	29,796.0	33,855.5	33,825.1
Difference - Existing		2,012.1	6,071.6	6,041.2
Difference - No-Build			4,059.5	4,029.1

North Adams Plaza Redevelopment - North Adams, MA

Annual Weekend CO_2 Emissions Inventory in Tons per Year

Pollutant	2007 Existing Condition	2012 No-Build Alternative	2012 Build Alternative	2012 Build Alternative With Mitigation
Carbon Dioxide	6,600.8	7,072.4	8,785.0	8,768.9
Difference - Existing		471.6	2,184.2	2,168.1
Difference - No-Build			1,712.6	1,696.5

North Adams Plaza Redevelopment - North Adams, MA

Annual Weekday CO_2 Emissions Inventory in Tons per Year

Pollutant	2007 Existing Condition	2012 No-Build Alternative	2012 Build Alternative	2012 Build Alternative With Mitigation
Carbon Dioxide	21,183.1	22,723.6	25,070.4	25,056.2
Difference - Existing		1,540.5	3,887.3	3,873.1
Difference - No-Build			2,346.8	2,332.6

Stationary Source Results – CO2 Emissions

Conversion Factors

Multiply	By	To Obtain	
Mwh	1107	lbs	(For Electricity)
Mbtu	117.08	lbs	(For Gas)
lbs	0.0005	tons	

CO2 Conversion Factors

Electricity **1107** lb CO2/Mwh ISO-New England Marginal Emissions Report
Gas **117.08** lb CO2/Mbtu The Energy Information Administration Documentation for Emissi 136 lb CO2/Mbtu

Coverage	City	Analysis Year	Building Location
MA	Boston	2007	North Adams, MA

	File Name	Building Type	Building Area	No. of Building	Total Elec. (Mwh)	CO2 from electricity (lbs)	CO2 from electricity s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	CO2 from gas s (tons)	TOTAL CO2 (tons)
Existing 2007	NorthAdams_ShoppingCenter_07Exist	Retail	95,712	1	1,062.20	1,175,855.40	587.93	2,441.90	285,897.65	142.95	**730.88**
						0.00	0.00		0.00	0.00	**0.00**
						0.00	0.00		0.00	0.00	**0.00**
											730.88

Total CO2 Emission Results (Stationary and Mobile Sources)

Existing Conditions (2006) CO2 from Building/Energy			Build Conditions (2011) CO2 from Building/Energy		Net Increase from No Build to Build CO2 from Stationary Source	
Shopping Center	730.88	tons	Bank	29.1 tons	462.6 tons	
			Lowes	1164.4 tons		
sum	730.9	tons	sum	1193.5 tons	Net Increase from No Build to Build CO2 from Mobile Source 4059.5 tons	Total Yearly CO2 Emission Increase= 4522.1 tons / 4.5 Mega_tons

Improved Build Conditions (2011) CO2 from Building/Energy		Net Increase from No Build to Build CO2 from Stationary Source	
Bank	29.1 tons	345.5	
Lowes	1047.3 tons		
sum	1076.4 tons	Net Increase from No Build to Improved Build CO2 from Mobile Source 4041.8 tons	Total Yearly CO2 Emission Increase= 4387.3 tons / 4.4 Mega_tons

CO2 Conversion Factors

Electricity **1107** lb CO2/Mwh ISO-New Elgnad Marginal Emissions Report
Gas **117.08** lb CO2/Mbtu The Energy Information Administration Documentation for Emissi 136 lb CO2/Mbtu

Coverage	City	Analysis Year	Building Location
MA	Boston	2012	North Adams, MA

	File Name	Building Type	Building Area	No. of Building
Build Conditions 2012	NorthAdams_Bank_2012Build	Uinknown, Custom or Mixed Use	3,600	1
	NorthAdams_Lowes_2012Build	Retail-Warehouse Sales	155,129	1
			158,729	

Total Elec. (Mwh)	CO2 from electricity (lbs)	CO2 from electricity s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	CO2 from gas s (tons)	TOTAL CO2 (tons)
38.61	42,741.27	21.37	132.38	15,499.05	7.75	**29.12**
1,767.30	1,956,401.10	978.20	3,180.80	372,408.06	186.20	**1,164.40**
						1,193.52

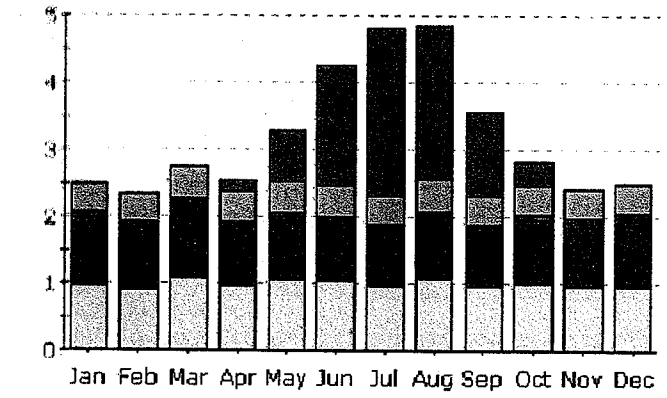
	File Name	Building Type	Building Area	No. of Building
Build Conditions w. Improvements 2012	NorthAdams_Bank_2012Build	Uinknown, Custom or Mixed Use	3,600	1
	NorthAdams_Lowes_2012Build	Retail-Warehouse Sales	155,129	1
			158,729	

Total Elec. (Mwh)	CO2 from electricity (lbs)	CO2 from electricity s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	CO2 from gas s (tons)	TOTAL CO2 (tons)
38.61	42,741.27	21.37	132.41	15,502.56	7.75	**29.12**
1,683.90	1,864,077.30	932.04	1,968.50	230,471.98	115.24	**1,047.27**
						1,076.40

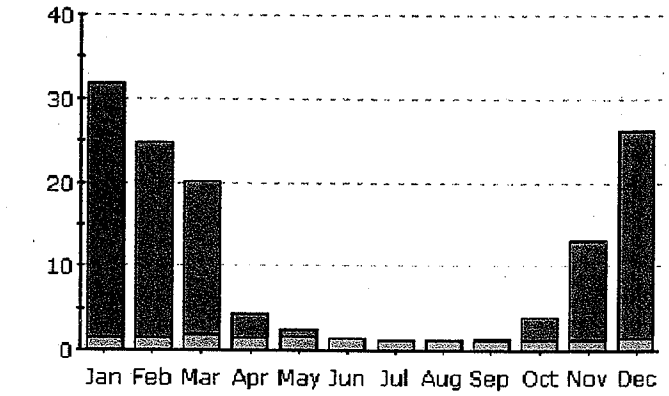
North Adams Plaza Redevelopment - Greenhouse Gas Analysis E-Quest Results
2012 Build with Improvements - Bank

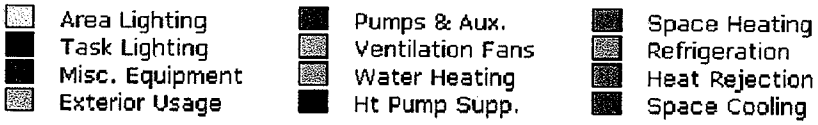
Project/Run: North Adams_Bank_2012Build_m - Baseline Design Run Date/Time: 06/27/08 @ 14:00

Electric Consumption (kWh)



Gas Consumption (Btu)





Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.16	0.78	1.80	2.52	2.28	1.25	0.36	-	-	9.15
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.43	0.41	0.50	0.43	0.48	0.48	0.43	0.50	0.43	0.45	0.43	0.43	5.40
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.88	0.82	0.95	0.87	0.93	0.92	0.88	0.95	0.87	0.90	0.87	0.88	10.72
Task Lights	0.03	0.03	0.04	0.03	0.04	0.04	0.03	0.04	0.03	0.04	0.03	0.03	0.44
Area Lights	0.95	0.90	1.08	0.95	1.04	1.04	0.95	1.08	0.95	1.00	0.95	0.95	11.85
Total	2.49	2.33	2.75	2.53	3.29	4.27	4.82	4.86	3.55	2.83	2.42	2.48	38.61

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	30.34	23.43	18.32	2.81	0.83	0.00	-	0.00	0.31	2.61	11.84	24.93	115.42
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.53	1.50	1.80	1.54	1.55	1.42	1.20	1.31	1.15	1.26	1.31	1.43	16.99
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	31.87	24.92	20.12	4.34	2.38	1.43	1.20	1.31	1.46	3.87	13.15	26.35	132.41

E-Quest Parameters (Lowe's)

Parameters	2012 Build (Code Compliant)	2012 Build with Improvements
Building Type	Retail	Retail
Area		
Building Area	155,129 square feet	155,129 square feet
Building Orientation	Northeast	Southeast
Cooling and Heating		
Cooling	DX Coils (EER = 8.5)	DX Coils (EER = 11.5)
Heating	Furnace (Efficiency = 0.78)	Furnace (Efficiency = 0.81)
Construction		
Roof surfaces	Metal Frame (>24in, o.c.)	No Exterior Exposure (Adiabatic)
Ground Floor		
Exposure	Earth Contact	Earth Contact
Construction	6 inch concrete	4 in concrete
Exterior Windows		
Glass Category	Double Clear/Tint	Double Low-E
Occupied Loads by Activity Area		
Office lighting (w/sq ft)	1.30	1.24

Lowe's Greenhouse Gas Awareness Program

Stationary

Greenhouse Gas Reduction Program	Reduction in CO2 Emissions (in tons/yr)
Green Power Purchase Power	18.64
Lowe's Energy Management Program	4.57
Total Reduction in CO2 Emissions (in tons/yr)	**23.21**

Mobile

Greenhouse Gas Reduction Program	Total Reduction in CO2 Emissions (in tons/yr)
Smartway Program	11.22
Total Reduction in CO2 Emissions (in tons/yr)	**11.22**

Other

Greenhouse Gas Reduction Program	Total Reduction in CO2 Emissions (in tons/yr)
PV Cells	34.41
Total Reduction in CO2 Emissions (in tons/yr)	**34.41**

Lowe's Greenhouse Gas Awareness Program

Green Power Purchase Power	
Total Electric Consumption (Mwh/yr)	1,683.9
Total Electric Consumption (tons/yr)	932.0
Percent Reduction	2%
Total CO2 Emission Reduction in tons/yr	18.64
Total CO2 Emission after Reduction (tons/yr)	913.4

Lowe's Greenhouse Gas Awareness Program

Energy Management Program	
Total CO2 Emission after Green Power Purchase Program (tons/yr)	913.4
Percent Reduction	0.5%
Total CO2 Emission Reduction in tons/yr	4.57
Total CO2 Emission after Reduction (tons/yr)	908.8

Lowe's Greenhouse Gas Awareness Program

Trucking Program	
Number of Trucks	730
Distance Travelled (miles/year)	250
Emission Factor (g/mile at 65mph)	557.53
Total CO2 Emissions (kg/yr)	101,749
Total CO2 Emissions in tons/yr	**112.2**
Percent Reduction	10%
Total CO2 Reduction (tons/yr)	**11.22**
Total CO2 Emissions after Reduction (tons/yr)	**100.94**

Lowe's Greenhouse Gas Awareness Program

PV Cells	Kwh/month
Electric Consumption (kwh/month)	5,180
Electric Consumption (tons/yr)	34.4

The Commonwealth of Massachusetts

Executive Office of Energy and Environmental Affairs
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Boston, MA 02114

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11/3/08 B

October 31, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT

PROJECT NAME:	North Adams Plaza Redevelopment
PROJECT MUNICIPALITY:	North Adams
PROJECT WATERSHED:	Hudson
EEA NUMBER:	14180
PROJECT PROPONENT:	North Adams Property Development, LLC
DATE NOTICED IN MONITOR:	September 24, 2008

As Secretary of Energy and Environmental Affairs (EEA), I hereby determine that the Supplemental Environmental Impact Report (EIR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

This project will redevelop an underutilized site thereby minimizing many of the environmental impacts associated with new development. The project has the potential to enhance the local tax base and to provide employment and retail opportunities for the local and regional area. In addition, the proponent has demonstrated its willingness to provide significant environmental mitigation measures, including mitigation of Greenhouse Gas (GHG) emissions.

Project Description

As described in the February 2008 Expanded Environmental Notification Form (EENF), the Single EIR and the Supplemental EIR, the project involves the redevelopment of a vacant strip commercial plaza on an approximately 13.4-acre parcel located on the west side of Route 8 across from the Robert Hardman Industrial Park in North Adams. The site has been underutilized

for approximately a decade and vacant since 2006. An approximately 95,712 square foot (sf) structure that formerly housed a cinema and a mix of restaurant and retail uses remains as well as approximately 630 parking spaces. The redevelopment includes demolition of the existing structure and construction of an approximately 126,500 sf Lowe's home improvement store with an associated 28,630 sf garden center and an approximately 3,600 sf separate drive-through bank or other retail facility on an out-parcel in the southeasterly corner of the site. Previously, a home improvement store was proposed on a site north of the proposed site. An EENF for that project was submitted in July 2005 (EEA# 13578). That project is no longer under consideration.

Approximately 620 parking spaces will be provided as part of the project. Access to the site will be provided via two driveways: 1) the existing signalized driveway to the site will be retained and will serve as the primary access and egress point for the site; and 2) a secondary right-in/right-out driveway is proposed approximately 500 feet north of the existing traffic signal. The existing right-in driveway will be closed.

Jurisdiction

The project is undergoing environmental review and requires the preparation of an Environmental Impact Report pursuant to Section 11.03(6)(a)(6) of the MEPA regulations because it requires state permits and it will generate more than 3,000 new average daily trips on roadways providing access to a single location. The project requires a National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the U.S. Environmental Protection Agency (EPA) and a Vehicular Access Permit from the Massachusetts Highway Department (MassHighway). The Proponent has received a Special Permit from the North Adams Planning Board and a permit from the North Adams Zoning Board of Appeals to reduce parking at the site to less than what is required under local zoning. The Proponent received an Amended Order of Conditions (OOC) from the North Adams Conservation Commission in July 2008.

Because the Proponent is not seeking financial assistance from the Commonwealth for the project, MEPA jurisdiction is limited to those aspects of the project that may cause Damage to the Environment as defined in the MEPA regulations and that are within the subject matter of required or potentially required state permits. In this case, jurisdiction extends to transportation, wetlands and stormwater. In addition, because the project requires a Vehicular Access Permit, the project is subject to the MEPA Greenhouse Gas Emissions Policy and Protocol (GHG Policy).

Review of the Supplemental EIR

The Supplemental EIR was required to provide a reasonably accurate quantitative analysis of total project emissions and potential mitigation that will allow the proponent and reviewers to assess the overall impact of the project as proposed, and the reduction in emissions if various measures are implemented. The Scope identified issues that should be resolved in the

Supplemental EIR to clarify the analysis provided in the Single EIR and to demonstrate that mitigation measures were adequately evaluated following the guidance in the GHG Policy.

The Supplemental EIR, and additional materials submitted on October 1, 2008 during the public comment period, provide a revised GHG analysis, explain discrepancies in the previous analysis and provide additional analysis of the feasibility of installing a solar photovoltaic (PV) system.

The Supplemental EIR clearly demonstrates that the difference between the 2012 Build and the 2012 Build with Mitigation scenarios for stationary sources as presented in the Single EIR (140.3 tpy reduction compared to a 68.7 tpy reduction) is associated with quantification of mitigation measures and not due to the change in the 2012 Build scenario between the EENF and Single EIR. The 2012 Build scenario for stationary sources increased from the EENF (1,122 tpy) and the Single EIR (1,193.5 tpy) due to changes in the model's weather inputs to customize weather patterns for the region. Additional materials, dated October 1, 2008, submitted during the public comment period provide the results from the EPA's COMMUTER Version 2.0 model for reductions of vehicle miles of travel (VMT) and trip reduction based on the proposed TDM measures.

The Supplemental EIR clearly identifies how the proponent has calculated percentage reductions. The percentage reductions are based on the total reductions from project improvements (i.e. 2012 Build – 2012 Build with Mitigation) divided by the total project emissions (2012 Build). Based on this calculation, the project will reduce transportation related GHG emissions by .2 percent and stationary sources by 11.8 percent.

The Supplemental EIR indicates that the GHG analysis was conducted for the entire project, including the 3,600 sf outparcel. However, mitigation measures are only proposed for the Lowe's building. The Supplemental EIR indicates that it will encourage the outparcel tenant to adopt GHG mitigation measures.

The proponent has provided an expanded discussion and analysis of the 50-kilowatt (kW) solar PV system on the proposed Lowe's building pursuant to the requirement of the GHG Policy to consider alternative mitigation measures. The Supplemental EIR indicates that the payback period for a 50 kW solar system at the proposed project would be approximately seven years and would provide an 8.6 percent rate of return. The Supplemental EIR indicates that the PV system is not feasible based on the following:

- the technology is not cost effective for the proposed building type and location;
- the alternative is cost-prohibitive for a project of this scale, due to the projected rate of return; and
- the unpredictability associated with government incentives (in particular the Federal Investment Tax Credit).

The Supplemental EIR indicates that the building could support a potential grid of then cell PVs if such a project were determined to be financially feasible in the future.

Comments from the Department of Environmental Protection (MassDEP) and the Department of Energy Resources (DOER) indicate that the proponent has responded adequately to its comments on the Single EIR. MassDEP and DOER indicate that a power purchase agreement with a third party provider could have a significant impact on the payback period of the solar PV system; however, this option was not analyzed as part of the Supplemental EIR. These comments indicate that detailed information on third party arrangements is available through the Mass Renewable Energy Trust (MRET) at the Massachusetts Technology Collaborative (MTC). In addition, these comments note that, since the filing of the Supplemental EIR, the Federal Investment Tax Credit was renewed as part of HR 1424, "Emergency Economic Stabilization Act of 2008," which addresses another of the proponent's concerns regarding the feasibility of such a system.

MassDEP and DOER urge the proponent to consider a third party arrangement for installation of a solar PV system. In the event that the proponent does not reconsider addition of a solar PV system, they recommend that the building be designed and constructed so as not to preclude future installation of a solar PV system. This would include locating and consolidating the HVAC and other roof-based systems on the north facing side of the roof and providing adequate structural support to accommodate the additional load associated with a PV system (5 – 10 lbs/sq-ft).

Mitigation

The Supplemental EIR indicates that the proponent is committed to the following specific mitigation measures to reduce GHG emissions from stationary sources:

- High-efficiency Energy Star compliant packaged heating, ventilation and air-conditioning (HVAC) systems (EER 11.5);
- Double Low-E glass windows to minimize heat loss;
- Motion sensors and lighting in the building's office space to reduce energy consumption;
- Additional roof insulation to minimize heat loss;
- White thermoplastic olefin (TPO) membrane roofing to reduce heat island effect on rooftop; and,
- Partial skylights at the garden center to reduce electrical usage.

Mitigation measures to reduce GHG emissions from mobile sources were identified in the Expanded ENF and Single EIR. The Supplemental EIR identifies one additional measure:

- The proponent will coordinate with the Berkshire Regional Transit Authority (BRTA) to address the pricing structure of the transit service to the site by encouraging the BRTA to eliminate the additional charge associated with crossing the Adams/North Adams town line.

In addition, the Proponent is committed to the following programs corporate-wide:

- Lowe's Energy Management Program – Lowe's implements energy management systems at each of their stores to reduce energy usage. The Proponent estimates that participation in the Energy Management Program results in an annual reduction of 4.4 tpy of carbon dioxide (CO_2).
- Green Power Purchasing Partnership – Lowe's purchases green power generated from renewable resources and allocates two percent of green power purchasing credit to each store. The Proponent estimates that GHG reductions due to the green power purchasing credit are approximately 18 tpy of CO_2 for the North Adams project.
- SmartWay Transport Partnership Program – This program is a partnership between the U.S. EPA and the freight industry to increase energy efficiency while reducing GHG emissions. The Proponent estimates that participation in the SmartWay program results in a reduction of 11.2 tpy of CO_2.
- Lowe's Energy Awareness Delivers Savings (LEADS) – The LEADs program is an energy awareness program for employees that seeks to promote measures to reduce GHG emissions and water consumption.
- Sale of Energy Star-qualified products – Lowe's participates in the U.S. EPA's Retail Partnership Program, and offers a variety of Energy Star products at its stores, including fans, dishwashers, lighting units, programmable thermostats, and sealing and insulation products.

Upon completion of construction, the proponent should provide a certification to the MEPA Office signed by an appropriate professional (e.g., engineer, architect, general contractor) indicating that the all of the mitigation measures referenced in the Section on Mitigation and Section 61 Findings in the Single EIR and the Supplemental EIR, or equivalent measures that collectively will reduce stationary source GHG emissions by 11.8 percent and mobile GHG emissions by .2 percent, have been incorporated into the project. The certification should be supported by as-built plans. For those measures that are operational in nature (i.e. TDM, recycling) the proponent should provide an updated plan identifying the measures, the schedule for implementation and how progress towards achieving the measures will be obtained. I request that MassHighway incorporate this self-certification requirement into its Section 61 Findings for this project. In accordance with Section 11.12 (5) (e) of the MEPA regulations, final Section 61 Findings must be forwarded by each permitting agency to the MEPA Office, which will publish a Notice of Availability in the Environmental Monitor.

In addition to the above noted measures, I urge the proponent to reconsider installation of a solar PV system in light of the likely continued rise in the electricity prices, the continued reduction in the cost of PV, opportunities for third party PV arrays with power purchase agreements, the recent extension of federal tax credits for solar PV systems and new opportunities for utility ownership of solar installations. A revised analysis could result in an improved projected payback period as suggested in the MassDEP and DOER comment letter. I note that the recently passed Climate Protection and Green Economy Act, M.G.L.c. 21N, mandates economy-wide reduction targets for GHG emissions in Massachusetts of between 10 and 25 percent by 2020. These mandates will be in place by 2011. I encourage the proponent to consider the potential advantages of early GHG reduction under the new law. I also encourage the Proponent to construct the facility with consideration for the added weight of PV systems so that a future installation is not precluded.

Finally, I encourage the proponent to work closely with the tenant of the outparcel to mitigate GHG emissions associated with this building. This could take the form of providing technical information on energy efficiency so that the tenant can benefit from the analysis of the energy savings and GHG reductions that have been identified for the Lowe's buildings, employees, and customers.

Conclusion

With this Certificate, I have found that the project has adequately met the requirements of the MEPA statute and the GHG Policy. However, as a national retailer with a stated commitment to environmental sustainability, energy efficiency and conservation at all of its locations, Lowe's is uniquely situated to go beyond the minimum requirements of today to demonstrate leadership in the emerging areas of renewable energy generation and greenhouse gas emissions reductions. As noted above, once fully implemented, the Climate Protection and Green Economy Act will require measures to reduce greenhouse gas reductions across the economy. In the interim period, Lowe's has an opportunity to take voluntary measures to curb its greenhouse gas emissions, reduce its own energy and operating costs, and lead the way toward the cleaner energy of the future. I encourage the proponent to seriously consider the opportunities available to make significant progress towards its own stated goals of energy use and emissions reduction through the use of new technology. The Executive Office of Energy and Environmental Affairs and the Massachusetts Department of Energy Resources are available to assist the proponent in evaluation and development of alternatives for future Lowe's stores in the Commonwealth.

Based on my review of the Supplemental EIR, review of comment letters and consultation with state agencies, I hereby find that the Supplemental EIR adequately and properly complies with MEPA and its implementing regulations. No further MEPA review is required. The project may proceed to permitting.

October 31, 2008
Date

Ian A. Bowles

Comments received:

10/24/08	Department of Environmental Protection (MassDEP) and Department of Energy Resources (DOER)
10/24/08	Executive Office of Transportation
10/28/08	Berkshire Regional Planning Commission
10/6/08	Julia Reidy

IAB/CDB/cdb

Buckley, Deirdre (EEA)

From: Johnson, Holly (EEA) [Holly.S.Johnson@state.ma.us]
Sent: Friday, October 24, 2008 3:27 PM
To: Buckley, Deirdre (EEA)
Subject: FW: North Adams GHG
Attachments: DEPDOERcmtonSuppEIRNoAdams10-24-8.doc

This is for you I think.

From: Weinberg, Philip (DEP)
Sent: Friday, October 24, 2008 3:26 PM
To: Johnson, Holly (EEA); Lusardi, Meg (ENE)
Subject: North Adams GHG

Holly and Meg,

Attached is the DOER/DEP comments on Lowe's No. Adams' GHG response in the Supplemental EIR. Hope this works for you.

To: Holly Johnson
From: MassDEP and DOER
Re: Supplemental EIR-14180 Lowe's North Adams-GHG Comments
Date: 10/24/08

The proponent has to a substantial extent responded to the agencies' comments on the Single EIR. In its analysis of a solar PV system for the project, the proponent notes the importance of the continuance of the Federal Investment Tax Credit. This program was renewed as part of HR 1424, "Emergency Economic Stabilization Act of 2008", and therefore supports the proponent's analysis which includes the credit. The analysis also assumed a REC revenue of $0.04/kWh for a term of 4 Years. More appropriate assumptions would be a REC revenue of $0.025/kwh for a term of 15 years, which could positively affect the payback term.

Although the proponent finds the payback period of 6-7 years as calculated unacceptable, per its pro forma the return on equity was calculated to be greater than 8%. DOER and DEP recommend that power purchase agreements with 3rd party owners be examined as a means to make solar PV a near term cost effective addition. Detailed information on such arrangements is available through the Mass Renewable Energy Trust at the Massachusetts Technology Collaborative. At a minimum, with the cost of solar PV projected to only decrease in the future, the building should be designed and constructed to be solar-ready, with the HVAC and other roof-based systems located and consolidated on the north facing side and the roof strong enough to support the additional load of 5 – 10 lbs/sq-ft to facilitate future installation of a PV system.

The Secretary's Certificate on the SEIR noted that the GHG Policy applies to the entire project, but the Supplemental continues to avoid making any commitments to the non-Lowes buildings based on the rationale that the build out of that portion is not Lowe's responsibility. The proponent's development model should not dictate compliance with GHG policy. But in the absence of an ability to make firm design commitments, at a minimum, the Department recommends that Lowe's provide energy efficiency technical information and support to the developer of that project segment so that it can benefit from the analysis of the energy savings and GHG reductions Lowe's has indentified for its buildings, employees, and customers.

BERKSHIRE REGIONAL PLANNING COMMISSION
1 FENN STREET, SUITE 201, PITTSFIELD, MASSACHUSETTS 01201
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www.berkshireplanning.org

October 28, 2008

Secretary Ian Bowles
EEA, Attn: MEPA Office
Deidre Buckley, EEA No. 14180
251 Causeway Street, Suite 900
Boston MA 02114

RE: **North Adams Plaza Redevelopment Supplemental EIR**
EEA #14180

Dear Secretary Bowles:

The Berkshire Regional Planning Commission (BRPC) is in receipt of the Supplemental Environmental Impact Report (Supplemental EIR) for the proposed North Adams Plaza Redevelopment. The Supplemental EIR is a limited-scope EIR to resolve outstanding issues regarding the EEA Greenhouse Gas (GHG) Emissions Policy. Please take into consideration the following comments regarding the limited-scope Supplemental EIR.

The Supplemental EIR states that the Proponent has reached out to the Berkshire Regional Transit Authority (BRTA) to modify the pricing structure of the bus fare. The Project Site is located just north of the Adams/North Adams Town line and BRTA fares are levied when crossing a Town line. With a fare increase enacted on Labor Day, the BRTA fare increased from $1.10 to $1.25. BRPC previously raised concerns that the additional fare may be a deterrent to utilizing alternative transportation and may result in safety issues. BRPC has raised the concern that people may choose to get off of the bus before crossing the town line and walk to the Project Site where sidewalks are not available. BRPC has been told by the BRTA that the fare will be waived at the Adams/North Adams Town line. The Proponent should continue to work with the BRTA to address both safety concerns and increase the possibility of a reduction in GHG emissions.

BRPC recommends that the Transportation Demand Management (TDM) provide incentives or rewards for those that utilize alternative transportation modes. Since there is a direct correlation between the Proponent and the tenants/employers, the TDM can be the means by which compensation is offered as an incentive or reward to those who carpool, vanpool, or otherwise avail themselves of alternative transportation. At a minimum, the Proponent should consider

within the TDM a quantitative form of measurement as to its effectiveness including the following:

- the number of carpool and vanpool parking spaces;
- the minimum occupancy;
- the dollar value offered to those who avail themselves of alternative transportation; and
- the amount of a subsidy for BRTA bus passes that will be available.

In addition, the TDM measures proposed include providing on-site services such as on-site break rooms with refrigerators, ATMs/banking services, etc. to reduce the need for employees to leave the center. It is unclear whether the ATMs/banking services referenced in the TDM are the same as those offered through the outparcel and whether the ATM will be offered as a drive thru. While ATMs/banking services provided on-site may reduce the need for employees to leave the center it is unclear whether they would result in reduced vehicle trips and a corresponding reduction in GHG emissions if they are offered through the outparcel and especially if the ATM will be offered as a drive thru.

According to the EPA, diesel pollution is a serious air quality issue across the country and running a vehicle's engine while it is stopped (known as idling) wastes fuel and creates air pollution and noise. A typical idling truck burns nearly a gallon of fuel per hour. Massachusetts has anti-idling rules that are included in the State Implementation Plan approved by EPA outlining how national air quality standards will be met. Regulations in the state implementation plan are enforceable by the state and by EPA. The Massachusetts rule prohibits vehicle idling over five minutes (with exceptions for periods of traffic, repairs, or operation of loading or refrigeration equipment). No idling signs, such as those used by the MTA which state "Attention Truck Drivers: State Regulation Truck Idling Time Limited to: 5 Minutes Maximum" should be installed throughout the site in appropriate locations in relation to delivery vehicles and drive thrus.

It is the opinion of BRPC that the Supplemental EIR adequately and properly complies with the Massachusetts Environmental Policy Act. These comments were endorsed by the Berkshire Regional Planning Commission's Clearinghouse Review Committee at their meeting on October 16, 2008. If we can be of further assistance in this matter, please feel free to call.

Sincerely,

Nathaniel W. Karns, AICP
Executive Director

2

Greenhouse Gas Emissions Analysis

Introduction

This chapter presents the updated air quality study conducted for the Project located in North Adams, Massachusetts as described in Chapter 1, *Project Summary*. The air quality study presented in both the January 2008 Expanded ENF and June 2008 Single EIR included an analysis of the ozone precursor emissions (mesoscale analysis) as well as the Greenhouse Gas (GHG) mobile and stationary source emissions and included an evaluation of the Project improvements aimed at reducing emissions.

The Executive Office of Energy and Environmental Affairs (EEA) has recently developed and issued a policy that requires project proponents to identify and describe the feasible measures to minimize GHG emissions. The *MEPA Greenhouse Gas Emissions Policy and Protocol* requires that projects undergoing review by the MEPA Office at the EIR level and meeting specific criteria (e.g., generation of 3,000 or more vehicle trips per day) to quantify the Project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying project-related GHG emissions, the Policy also requires proponents to quantify the impact of proposed improvements in terms of emissions and energy savings. The goal of the Policy is to identify measures to reduce or minimize the GHG emissions. While GHG emissions include several gases, Carbon Dioxide (CO2) was selected for evaluation because it is the most significant component of project-related GHG emissions. EPA has not set NAAQS for GHGs; however, they do encourage strategies to reduce emissions and save fuel.

The Secretary's MEPA Certificate on the Single EIR, dated August 15, 2008, requested that the Proponent respond to comments related specifically to the GHG analysis, including clarify the GHG emission calculations, supporting documentation and proposed improvements as well as expand on the discussions of proposed alternative improvements and off-site/off-setting measures. Based on consultations with the MEPA Office, the purpose of this section is to address the Secretary's Certificate through a limited scope of updating the Project's GHG emissions analysis.

Summary of Mesoscale Analysis

The Expanded ENF mesoscale analysis evaluated the change in emissions from Project-related traffic for the 2007 Existing, 2012 No-Build, and 2012 Build, and 2012 Build with Mitigation conditions. The mesoscale analysis demonstrates that the Project meets the DEP air quality criteria. Under the Build Condition, the VOC emissions were estimated to increase by 5.5 kg/day and the NOx emissions by 9.6 kg/day from the No-Build Condition. With the recommended mitigation measures, the volatile organic compounds (VOC) and oxides of nitrogen (NOx) emissions are estimated to be reduced by 0.2 kg/day and 0.1 kg/day, respectively, from the 2012 Build Conditions.

The analysis of Project-related impacts indicates that with the implementation of improvements, the additional site-generated traffic associated with the Project will not have an adverse impact on the majority of intersection traffic operations. Additionally, the proposed TDM measures are expected to reduce the VOC and NOx emissions associated with the Project, therefore, demonstrating compliance with the transportation conformity criteria.

Summary of Greenhouse Gas Emissions Analysis

In compliance with the *MEPA Greenhouse Gas Emissions Policy and Protocol*, the air quality analysis of both the Expanded ENF and Single EIR calculated GHG emissions from mobile and stationary sources for the Project (both the proposed Lowe's store and the out parcel, as presented in Figure 1.3 for a proposed conditions site plan). While GHG emissions include several gases, Carbon Dioxide (CO2) was selected for evaluation because it is the most significant component of development project-related GHG emissions.

The mobile source emissions were calculated by performing an annual GHG emissions mesoscale analysis to evaluate the changes in CO2 emissions for the existing and future conditions within the study area. Similar to the mesoscale analysis for ozone (summarized above), the year 2012 was selected as the future year of analysis because MEPA's policy requires that a project look five years into the future from the current year of analysis. The mobile source analysis traffic (volumes, delays, and speeds) and emission factor data were developed for four conditions: (i) 2007 Existing, (ii) 2012 No Build, (iii) 2012 Build, and (iv) 2012 Build with Improvements.

In addition to mobile sources, direct and indirect CO2 emissions from the Project's proposed building sources were calculated using the computer-based EQUEST

model[1]. Direct emissions included those emissions from the Project itself such as boilers, heaters, and internal combustion engines. Indirect emissions included CO2 emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems.

Total CO2 emissions were determined by combining the CO2 results from the mobile source analysis with the CO2 results from the proposed direct and indirect building source analysis.

Mobile Source CO2 Emissions Results

Refer to Table 2-1 below for a summary of the mobile source CO2 emissions analysis results. Currently, 2007 Existing Condition traffic emits 27,783.9 tons per year of CO2. Under the 2012 No-Build Condition, CO2 emissions increase to 29,796.0 tons per year compared to the 2007 Existing Condition due to projected growth of the area (not including the Project). Under the 2012 Build Condition, the Project-related traffic is projected to increase CO2 emissions by 4,059.5 tons per year for a total of 33,855.5 tons per year compared to the 2012 No-Build Condition. However, under the 2012 Build with Improvements Condition, the proposed physical roadway improvements and TDM mitigation measures are projected to reduce CO2 emissions by 52.8 tons per year, resulting in a total of 33,802.7 tons per year. This represents an approximately 0.2 percent reduction of the 33,855.5 tons per year (2012 Build Condition). The mobile source CO2 emissions percent reduction is calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{Reductions Due to Project Improvements}}{\textit{2012 Build Condition}}$$

The percent reduction in mobile source emissions due to Project-related transportation improvements is: 52.8/33,855.5 = 0.0015 x 100 = 0.15% or 0.2% (Table 2-1).

Stationary Source CO2 Emissions Results

Refer to Table 2-2 below for a summary of the stationary source CO2 emissions analysis results. Currently, existing buildings emit 730.9 tons per year of CO2[2]. The 2012 Build Condition (which meets minimum building code requirements) is projected to generate 1,193.5 tons per year of CO2 emissions. Because the Project is eliminating the existing building emissions of 730.9 tons per year of CO2, the actual total 2012 Project Emissions is 440.5 tons per year. Under the 2012 Build with Improvements Condition, the CO2 emissions were estimated to be reduced by 140.3 tons per year for a total of 1,053.2 tons per year compared to the 2012 Build Condition due to building and operational improvements, such as high efficient HVAC systems and motion sensors for lighting. The 140.3 tons per year represents

[1] EQUEST (the Quick Energy Simulation Tool), Version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA

[2] While the existing strip mall is currently vacant, it was assumed that systems such as lighting and heating would continue to be operational for security purposes and to avoid freezing pipes.

an approximately 12 percent reduction over the 2012 Build Condition. The stationary source CO2 emissions percent reduction is calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{Reductions Due to Project Improvements}}{\textit{2012 Build Conditions}}$$

The percent reduction in stationary source emissions (direct and indirect) due to Project improvements is: 140.3/1,193.5 = 0.118 x 100 = 11.8% or 12% (Table 2-2).

Updated Greenhouse Gas Emissions Analysis

As mentioned above, the Secretary's MEPA Certificate on the Single EIR, dated August 15, 2008, requested that the Proponent respond to comments related specifically to the GHG analysis, including clarifying the GHG emission calculations, supporting documentation and proposed improvements as well as expanding on the discussions of alternative project improvements and off-site/off-setting measures. The following section provides an updated GHG emissions analysis in response to the Secretary's Certificate and GHG-related comments received on the Single EIR.

Mobile Source Methodology

The GHG mobile source analysis was conducted following procedures similar to the ozone mesoscale analysis (summarized above). The mobile source analysis estimated the area wide CO2 emissions from vehicle traffic for a time period of one year. The change in CO2 emissions from traffic were based on the average yearly traffic volumes, roadway lengths and vehicle emissions factors for existing and new trips for weekday and weekend conditions. The GHG analysis also calculated the changes in CO2 emissions due to the proposed roadway mitigation measures and TDM measures using the EPA's COMMUTER[3] model Version 2. Mobile source GHG emissions are based upon the traffic volumes, the distance traveled and the GHG emission rate (in grams per vehicle mile traveled). The COMMUTER model evaluates the study area and the Project to identify measures that would reduce or eliminate vehicle trips and, therefore, GHG emissions.

Mobile Source Emission Rates

Currently MOBILE6.2 has a simple estimate of CO2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect. The

[3] COMMUTER, version 2.0 release from EPA (U.S. Environmental Protection Agency)

emission rates calculated in this air quality study are adjusted to reflect Massachusetts specific conditions. A detailed presentation of the MOBILE6.2 input and output data are presented in Appendix C.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mobile source analysis for CO2 emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The traffic data used in the air quality study are presented in Appendix C. The detailed traffic analysis is presented in Chapter 4, *Transportation* of the Expanded ENF.

Stationary Source Methodology

The stationary source analysis calculated Project-related CO2 emissions from building sources (electricity and/or fossil fuels) using the computer-based EQUEST model. These building sources included boilers, heaters and internal combustion engines. Because the Project is in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. To estimate GHG-related impacts, the stationary source analysis compares GHG emissions for two build conditions: (i) 2012 Build; and (ii) 2012 Build with Improvements. The 2012 Build Condition represents the stationary source emissions that would result if the Project were to be built using typical/allowable construction materials and electrical and heating/cooling equipment as prescribed by the Massachusetts Building Code (meeting minimum requirements)[4]. The 2012 Build with Improvements Condition represents the Project-related emissions resulting from the use of improved building materials, electrical systems and/or heating/cooling equipment.

Existing CO2 Emissions

The calculation of 2007 Existing Condition emissions provides a base for which future years can be evaluated.

Existing Mobile Source CO2 Emissions

The mobile source analysis calculated the 2007 Existing Condition CO2 emissions from the major roadways in the study area. These emissions, estimated to be

[4] Massachusetts Building Code 780 CMR, 6th Edition (2006).

27,783.9 tons/year, establish a baseline to which future emissions can be compared. Table 2-1 below presents the existing mobile source CO2 analysis results for the 2007 Existing Conditions.

Existing Stationary Source CO2 Emissions

The GHG analysis calculated the 2007 Existing Condition CO2 emissions for direct and indirect emissions from the existing stationary sources. Under the 2007 Existing Condition, the CO2 emissions were estimated to be 730.9 tons per year, establishing a baseline to which future emission can be compared (Table 2-2). While the existing strip mall is currently vacant, it was assumed that systems such as lighting and heating would continue to be operational for security purposes and, possibly, to avoid freezing pipes. (**Note*: This baseline changed from the Expanded ENF of 686.8 tons per year because the EQUEST model was revised to customize the weather information for the area (Boston, Amherst or Stockbridge) – a capability not previously known. The Expanded ENF contained weather information for Boston and the Single EIR analysis was updated to Stockbridge, which is closer to North Adams than Boston and, therefore, it can be assumed has similar weather conditions to North Adams compared to Boston. It should be noted that this weather update was carried through all of the conditions for the stationary source analysis, including the 2012 Build and 2012 Build with Improvements. This weather adjustment is unique to EQUEST and only applies to the stationary source analysis. The mobile source analysis is not affected by this issue.)

■

Future CO2 Emissions

Future Project-related emission calculations are based upon changes in traffic and emission factor data as well as the Project's building sources. The traffic data include traffic volumes, vehicle-miles-of-travel, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The Project's building sources included direct emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following section reports the findings of the mobile source and stationary source (direct and indirect) analyses for the Project.

Future Mobile Source CO2 Emissions

The mobile source analysis estimated the future study area CO2 emissions due to the changes in traffic and emission data. Under the 2012 No-Build Condition, CO2 emissions were estimated to be 29,796.0 tons per year (Table 2-1). The 2012 No-Build Condition CO2 emissions are greater than the 2007 Existing Condition CO2 emissions (27,783.9 tons per year) because the projected increase in traffic volumes in

2012 as compared to the existing traffic volumes due to growth within the study area (without the Project).

Under the 2012 Build Condition, the mobile source CO2 emissions were estimated to be 33,855.5 tons per year (Table 2-1). Under the 2012 Build Condition with Improvements, the mobile source CO2 emissions were estimated to be 33, 802.7 tons per year (Table 2-1). This results in a decrease of 52.8 tons per year in mobile source CO2 emissions as compared to the 2012 Build Condition. This reduction is due to the proposed signal timing improvements of the study area roadways, TDM measures and operational measures (Lowe's SmartWay trucking program, described below). This represents an approximately 0.2 percent reduction of the 33,855.5 tons per year (2012 Build Condition). The mobile source CO2 emissions percent reduction is calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{Reductions Due to Project Improvements}}{\textit{2012 Build Condition}}$$

Therefore, the percent reduction in mobile source emissions due to Project-related improvements is: 52.8/33,855.5 = 0.0015 x 100 = 0.15% or 0.2% (Table 2-1). Specific details of these proposed improvements are discussed below in the 'Mobile Source-Related Improvements' section below. The percent reduction for mobile sources is low because of the type (home improvement retail store) and location (fairly rural area) of the Project — both of which are not conducive to major mobile source improvements. Office-type developments in more urban settings are ideal in achieving major mobile source reductions. Table 2-1 below presents CO2 emissions from mobile sources under all conditions.

Table 2-1
Mobile Source CO2 Emissions (tons per year)

2007 Existing Condition	2012 No-Build Condition	2012 Build Condition	2012 Project Emissions	2012 Reductions Due to Project Improvements	2012 Build w/ Improvements Condition[1]	Percent Reduction of Project Improvements to Project Emissions
27,783.9	29,796.0	33,855.5	+4,059.5	-52.8	33,802.7	-0.2%

1 The proposed improvements are described in 'Proposed Project Improvements' section below. Mobile source improvements include roadway/traffic improvements, TDM measures and the Lowe's corporate SmartWay Transport Partnership Program.

In response to the Secretary's Certificate on the Expanded ENF, the updated analysis provided in the Single EIR quantified specific TDM measures (outlined below), which resulted in an additional reduction of 23.8 tons per year compared to the original projection of 17.8 tons per year for a total of 41.6 tons per year (Table 3-1 of the Single EIR). The Single EIR also presented and quantified the Lowe's corporate SmartWay Transport Partnership Program for delivery trucks (described further below), which would result in an additional reduction in mobile source CO2 emissions of 11.2 tons per year. Therefore, as represented in Table 2-1 above, a total

reduction of 52.8 tons per year of mobile source CO2 emissions would result under the 2012 Build with Improvements Condition.

Future Stationary Source CO2 Emissions

The Project would generate GHG emissions thru the use of electricity and fossil fuels. The air quality analysis calculated the direct and indirect stationary source CO2 emissions for the 2012 No-Build, the 2012 Build, and 2012 Build with Improvements conditions. Direct emissions includes those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions includes those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems.

Under the 2012 No-Build Condition, the stationary source CO2 emissions were estimated to be 730.9 tons per year (Table 2-2), which accounts for a small level of electricity use at the vacant existing strip mall[5]. This is the same amount of stationary source CO2 emissions as the 2007 Existing Condition because it is assumed that there would be no change in the on-site conditions.

Under the 2012 Build Condition, the CO2 emissions were estimated to be 1,193.5 tons per year (Table 2-2). This estimate increased slightly from the Expanded ENF (1,122 tons per year) due to the change in the weather conditions in the model throughout all analysis conditions (as discussed in the 'Existing Stationary Source CO2 Emissions' section above). Under the 2012 Build Condition with Improvements, the stationary source CO2 emissions were estimated to be 1,053.2 tons per year, which results in a decrease of 140.3 tons per year compared to the 2012 Build Condition (Table 2-2). This reduction in stationary source emissions is due to the proposed building and operational improvements (discussed in the 'Proposed Project Improvements' section below) and represents an approximately 12 percent reduction of the 1,193.5 tons per year 2012 Build Condition. The stationary source CO2 emissions percent reduction was calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{Reductions Due to Project Improvements}}{\textit{2012 Build Condition}}$$

Therefore, the percent reduction in stationary source emissions due to Project improvements is: 140.3/1,193.5 = 0.118 x 100 = 11.8% or 12% (Table 2-2).

Table 2-2 below presents CO2 emissions from direct and indirect stationary sources under all conditions.

[5] This baseline changed from the Expanded ENF of 686.8 tons per year because the EQUEST model was revised to customize the weather information for the area (Boston, Amherst or Stockbridge) – a capability not previously known. The Expanded ENF contained weather information for Boston and the Single EIR analysis was updated to Stockbridge, which is closer to North Adams than Boston and, therefore, it can be assumed has similar weather conditions to North Adams compared to Boston.

Table 2-2
Stationary Source CO2 Emissions (tons per year)

2007 Existing Condition	2012 No-Build Condition	2012 Build Condition[1]	2012 Project Emissions	2012 Reductions Due to Project Improvements	2012 Build w/ Improvements Condition[2]	Percent Reduction of Project Improvements to Project Emissions
730.9	730.9	1,193.5	+440.5	-140.3	1,053.2	-12%

Notes:
[1] The 2012 Build Condition is assumed to meet the minimum requirements of the MA Building Code.
[2] The proposed improvements are described in 'Proposed Project Improvements' section below. Improvements include building design efficiencies as well as other GHG-related corporate-wide programs.

As mentioned above, the Single EIR stationary source emissions analysis included updated weather conditions information (Stockbridge from Boston). Therefore, as a result of revising the weather conditions in the model and identifying and quantifying additional GHG-related mitigation measures as part of the Single EIR, the 2012 Build with Improvements changed from 1,053.3 tons per year in the Expanded ENF to 1,076.4 tons per year in the Single EIR. The 1,076.4 tons per year of stationary source emissions was then reduced further by the estimated 23.2 tons per year for operational measures (the Green Power Purchasing Program and Lowes Energy Management Program, which are discussed further below) resulting in a total of 1,053.2 tons per year (Table 3-1 of the Single EIR). The Single EIR demonstrated that the GHG total mitigation reductions of 140.3 tons per year (which includes the above-mentioned additional operational measures) increased from the reductions presented in the Expanded ENF (68.7 tons per year) due to the updated GHG analysis and additional improvements all of which result in a 12 percent reduction.

■

Proposed Project Improvements

The Proponent has developed both physical and operational mitigation energy efficient measures to be included in the proposed Lowe's store and to be encouraged at the smaller 3,600 square feet outparcel (where noted). It is important to note that the Proponent does not control the out parcel, which will be developed/fit-out by a separate entity. The below-mentioned improvements evaluated in the GHG analysis/model are proposed for the larger of the two proposed structures making them most effective in reducing GHG emission and, therefore, meeting the intent of the *MEPA Greenhouse Gas Emissions Policy and Protocol*[6]. In summary, the overall Project-related GHG emissions reductions (mobile and stationary sources) total 193.1 tons per year (Tables 2-1 and 2-2).

▼

[6] It is important to note that not all Lowe's stores are created equal in their ability to incorporate GHG improvements and/or additional sustainable elements due to location, financing structure, and/or projected sales volume.

Mobile Source-Related Improvements

As presented in Chapter 3, *Mitigation and Benefits*, the Proponent will implement roadway improvements, including modifications to signal phasing and timing plan to increase capacities and reduce delays of the intersection. Additionally, a TDM program will be implemented as part of the Project in an effort to reduce Project-generated vehicle trips and to minimize peak-period traffic demands in the study area. The implementation of the TDM program is expected to improve air quality in the study area by increasing the number of persons in a vehicle, and promoting the use of alternative modes of travel. The Proponent has committed to the following TDM measures:

- Facilitate bicycle and pedestrian travel by providing bicycle racks and lockers, sidewalks and signalized pedestrian crosswalks;
- Provide improved access from the Project to transit, specifically to the Berkshire Regional Transit Authority (BRTA) bus services to encourage use of alternative transportation (**Note*: As discussed below under 'Other Project Improvements/Off-Site Improvements', this commitment has been expanded since the Single EIR to include coordination with the BRTA regarding the bus fare pricing structure);
- Provide for staggered work hours (*will encourage the outparcel tenant);
- Offer direct deposit of paychecks to their employees[6] (*will encourage the outparcel tenant);
- Provide preferential carpool and vanpool parking within the employee parking areas as a convenience to participants to promote ridesharing (described further below) (*will encourage the outparcel tenant);
- Promote alternative transportation (biking, transit and/or walking) to/from the Project (*will encourage the outparcel tenant); and
- Provide on-site services such as on-site break rooms with refrigerators and lockers, ATMs/banking services, etc. to reduce the need for employees to leave the center.

Additionally, the Proponent will implement a non-traditional TDM measure as part of the Project: the SmartWay Transport Partnership for delivery trucks. This program aims to reduce trips and provide for more fuel efficient trucking operations. Refer to the 'Additional Project Improvements' section below for further details.

In response to comments received from the Berkshire Regional Planning Commission, the Proponent has reached out to the BRTA to modify the pricing structure of the bus fare. Currently, the rider pays an additional $1.10 when crossing over the Adams/North Adams town line, which lies just south of the Project Site. In

[6] Almost 90% of Lowe's employees corporate-wide currently utilize the direct deposit option.

recent conversations the BRTA has agreed to entertain doing away with this additional fee when stopping at the Project's proposed bus stop once all permits are secured and the Project is moving forward. This effort, on behalf of the Proponent, is beneficial not only because of the reduced fare for future customers and riders, but for the potential additional reductions in the Project-related mobile source CO2 emissions through further encouragement of alternative transportation to the Site and in the region.

The proposed on-site Rideshare Program is aimed at offering flexible operation for employees based on individual needs. The Proponent is committed to promoting ridesharing via car pool programs for employees. The Proponent will provide information regarding carpooling and its benefits that will be distributed to on-site employees, and interested carpooler names will be posted in common employee areas. The Proponent will work to consistently promote and encourage the complete rideshare program to all employees, including ride-matching, accommodating work shifts, incentives, and preferential parking. Preferential parking spaces for employees that carpool will be designated as those spaces within employee parking areas located convenient to the building entrance. Also, the Proponent will evaluate further any transportation tax benefit program offered by the state (i.e., decreased taxes for employers and employees) to further encourage employees to take transit or vanpools to work.

Temporary Construction-Related Mobile Sources

As discussed in the preceding MEPA documents for the Project and in Chapter 3, *Mitigation and Benefits* of this Supplemental EIR, in an effort to reduce GHG emissions from temporary construction activities, the Proponent will contractually require the construction contractors to adhere to all applicable regulations regarding control of construction vehicle emissions. This will include, but not be limited to, maintenance of all motor vehicles, machinery, and equipment associated with construction activities and proper fitting of equipment with mufflers or other regulatory-required emissions control devices. Also, the prohibition of excessive idling of construction equipment engines will be implemented, as required by DEP regulation 310 CMR 7.11. Additionally, construction specifications will require that all diesel equipment used on-site will be fitted with after-engine emission controls such as oxidation catalysts or diesel particulate filters. Additionally, the Proponent will contractually require the construction contractors to utilize ultra-low sulfur diesel fuel for all off-road construction vehicles as an additional measure to reduce air emissions from construction activities. The Proponent will post idling restriction signs on the premises to remind drivers, patrons and delivery personnel of the state's idling regulation.

A preliminary estimate of the stationary source CO2 emissions reduction due to the implementation of this program at the Project is 4.6 tons per year.

Energy Star Partnership (Stationary Source)

Lowe's has been recognized by the EPA and the Department of Energy for its efforts to protect for the environment. Since 2001, Lowe's have been raising awareness of energy efficient products and renovation or improvement projects for its customers (most of which are homeowners) by promoting the use of new energy efficient products such as compact fluorescent light bulbs. Lowe's educates through their 'Partner Websites' and in their retail stores[10]. Lowe's has qualified for the EPA Retail Partnership Program, was named the "Energy Star Retail Partner of the Year" by the US EPA in 2003, 2004 and 2005 and has won the "Energy Star Award for Excellence in Retail Commitment" for six consecutive years. A variety of Energy Star products are available at Lowe's, these products ranges from fans, dishwashers, lighting units, programmable thermostats to sealing and insulation products.

Lowe's Energy Awareness Delivers Savings (LEADS) (Stationary Source)

In February 2008, Lowe's introduced an energy awareness program (Lowe's Energy Awareness Delivers Savings, or LEADS) to all of their employees in effort to reduce greenhouse gas emissions and water waste. The LEADS Program is an informational program to increase energy and water awareness of Lowe's store managers, management team and sales associates. The objective is to increase energy and water utilization efficiency by encouraging employees to embrace "Best Practices." By improving operational efficiency (such as refraining from leaving overhead doors open for extended periods of time) can significantly reduce energy and water consumption and associated costs saving Lowe's millions in heating and cooling expenses.

Under the energy awareness program, Lowe's benchmarks all stores regarding their energy and water usage. Energy usage is weather and calendar normalized and stores' current performances are compared to their historical performances as well as other stores. Participating stores are provided with LEADS energy savings documents, including a checklist (including items of energy consuming opportunities, which are translated into energy reduction results), educational materials, factoids, and associated reports. Each participating store will determine the electrical and water maintenance issues and report any energy anomalies on-site. A complete energy and water consumption analysis will be performed and baseline consumptions and trends of each store will be recorded and compared against the benchmarks to monitor the progress of the program's success.

[10] Lowe's "Efficient Home" program promotes the use of Energy Star products and educates homeowners on ways to reduce demands on energy and water.
http://lowes.com/lowes/lkn?action=pg&p=/MiddlePageFiles/middleEnergyCenter.html

From March 2008 through June 2008, Lowe's as a corporation has documented an energy savings of 3.4 percent, which equals a reduction of approximately 180 billion BTUs. This is reduction is consistent with the benchmark, which was set at 2 percent energy reduction in FY 2008. A revised benchmark of 5 percent in energy reduction has been set for FY 2009. The water use tracking is still undergoing some development modifications and is not available at this time. A specific target for water is being formulated for FY 2009.

■

Alternative Project Improvements

MEPA's GHG Policy calls for providing data for an alternative that result in greater GHG reductions than the preferred alternative, or the Project. As demonstrated above, Lowe's is committed to reducing electrical usage at the Project where practical and feasible. Lowe's is also currently testing Photo-voltaic (PV) demonstration projects in California and Hawaii, and is gathering information on energy performance and operating costs. Solar resource is more plentiful in those states than in New England, and the use of PV cells will be more efficient. In the near future, Lowe's will have specific life cost data to evaluate whether PV systems are feasible for store design at other locations in the country.

For the purposes of this alternative analysis, a facility of the proposed size could utilize a 50 kW solar PV system. In Massachusetts a 50 kW solar PV installation is projected to generate approximately 5,180 kWh per month[11], which equates to approximately 34.4 tons per year in GHG emissions reductions.

The estimated installed cost of the system is $7 to $9 per rated Watt, which gives a cost range of $350,000 to $450,000 for each system. The payback period for the proposed 50kW PV installation was calculated using the Massachusetts Technology Collaborative "Non-Residential Rebate and Savings Estimator," a financial payback calculator provided through the Commonwealth Solar Initiative[12]. Examples of the payback calculator inputs/assumptions include:

- Size of installation;
- Estimated cost of the system;
- Available rebates scenarios;
- Net capacity/system efficiency;
- Projected long-term annual operations and maintenance cost;
- Estimated electricity revenue; and

▼

[11] *A Guide to Solar Electricity for Massachusetts Businesses*, Massachusetts Technology Collaborative: Renewable Energy Trust, February 2008.

[12] *Non-Residential PV Pro-Forma* calculator used can be found at: http://masstech.org/cleanenergy/cando/howto.htm#ret

- Inflation rate.

Despite the potential state rebates, such as the Massachusetts Commonwealth Solar Program, or the state and federal tax incentives, the payback period on the proposed solar PV system is estimated to be approximately seven years, at best. Based on market research, almost 90 percent of strong prospects would consider a payback of 4 years, but acceptance begins to drop rapidly once paybacks reach 5 years[13].
A more pressing issue regarding the payback period is the Federal Investment Tax Credit for solar projects, which is currently scheduled to expire on December 31, 2008 if Congress does not renew it.[14,15] The current tax credit is a significant 30 percent of the installed cost of the system; however, it would drop to 10 percent if it is not renewed, which would increase the payback period on the proposed system to 18 to 20 years. Where a typical life span of a PV panel is 25 years, a potential 18 to 20 year payback is not financially sound given the fact that the system will have to be replaced a few years after it finally achieves its payback. Refer to Appendix C for supporting documentation on the estimated payback for the PV system.

While GHG emissions could be reduced for the Project, the PV system was determined to not be feasible or cost-effective at this time because of one or more of the following reasons:

- The technology is not cost-effective for the proposed building type and location;
- From a business standpoint, the alternative is cost-prohibitive for a project of this scale, due to the projected rate of return; and
- Due to the unpredictability associated with the government incentives (in particular, the Federal Investment Tax Credit).

The PV system is not currently part of the Lowe's store design. If financially feasible in the future, however, the roof structure as designed would support a potential grid of thin cell PVs.

Conclusion

The air quality study demonstrates that the Project complies with the Clean Air Act Amendments (CAAA), the State Implementation Plan (SIP), and the Executive Office of Energy and Environmental Affairs (EEA) policy on Greenhouse Gas emissions. The ozone mesoscale analysis demonstrates that the Project will result in an increase of VOC and NOx emissions, as compared to the No-Build Condition.

Consistent with the guidelines of the Massachusetts Department of Environmental Protection (DEP), the Project will incorporate reasonable and feasible mitigation measures to reduce VOC and NOx emissions. These mitigation measures include

[13] *Assessment of California CHP Market and Policy Options for Increased Penetration*, Final Report, July, 2005 Cosponsors Public Interest Energy Research Program (PIER) and California Energy Commission
[14] Congress has failed to pass the Federal Investment Tax Credit for solar (S. 3335) eight times so far.
[15] Any project that is not installed and operative by December 31, 2008 will not be eligible to receive the tax credit.

roadway improvements, traffic signal improvements and a TDM program. The implementation of these mitigation measures will help reduce the VOC and NOx emissions associated with the Project. The GHG emissions analysis demonstrates that the Project meets the EEA draft policy on GHG emissions because it includes mobile and stationary source mitigation measures that will reduce the GHG emissions from levels expected from a project without mitigation.

The air quality study demonstrates that the Project conforms to the CAAA, the SIP, and EEA GHG policy because:

- It will implement reasonable and feasible emission reduction mitigation measures;
- No new violation of the NAAQS will be created;
- No increase in the frequency or severity of any existing violations will occur; and
- No delay in attainment of any NAAQS will result.

Transportation Demand Management (TDM) Plan

In addition to efforts aimed at increasing the roadway system capacity, existing and anticipated deficits can also be improved through reductions in the magnitude of peak hour vehicle demand. Transportation Demand Management (TDM) strategies are the supporting measures that encourage the use of alternatives to driving alone resulting in fewer vehicle trips on the roadway system during the peak periods.

The proposed TDM Plan for the Project includes items such as public transit, pedestrian and bicycle facilities (described further below) and carpooling incentives – all of which will aim to encourage alternative transportation modes for the on-site retail employees and customers to further reduce peak traffic demand on the roadway system and reduce air pollution. Refer to the draft Section 61 Finding (Appendix D) for a comprehensive list of the proposed TDM measures.

Pedestrian and Bicycle Facilities and Public Transit

The Project will utilize an urban streetscape design theme and provide improved accessibility via new pedestrian walkways and crossings.

Bicycling to the development may be attractive to some employees and local customers. To facilitate both employee and customer bicycle access to the Project, secure bicycle storage racks can be provided near the front doors of the retail store and lockers will be provide for employee use.

The Proponent will coordinate with the BRTA on the installation of a sheltered bus stop on the west side of Route 8, which will improve access to the site via BRTA Route 1. A bus bay will also be provided in order to improve the safety of the bus occupants as the buses pick-up and discharge passengers. The southbound stop would be located on the south side of the signalized intersection in front of the proposed bank, and is expected to accommodate one bus. Providing a bus shelter and pedestrian accommodations is expected to encourage the use of BRTA buses by those employed at the Site, as well as employees of the Robert Hardman Industrial Park on the east side of Route 8. Lastly, pedestrian crosswalks and wheelchair ramps will also be provided across the southerly and easterly legs of the Route 8/Site Driveway intersection. The crossing will accommodate pedestrians using the BRTA system in either the northbound or southbound directions.

Air Quality

The following measures are proposed in order to reduce air quality impacts related to both mobile and stationary sources.

Mobile Sources

As discussed above in the 'Transportation' section, the Proponent will implement signal improvements to the roadways to reduce delays and queing, as part of the Project in order to minimize peak-period traffic demands in the study area. The mesoscale analysis calculated the changes in VOC and NOx emissions due to the roadway mitigation. The results of the mesoscale analysis demonstrate that the roadway improvements will meet the transportation conformity criteria by reducing both VOC and NOx emissions. The Proponent will also implement a TDM program as part of the Project in order to reduce Project-generated vehicle trips and to minimize peak-period traffic demands in the study area. While the mesoscale analysis does not quantify the emission reductions from proposed TDM mitigation measures, their implementation is expected to result in additional improvements to air quality in the study area.

The *MEPA Greenhouse Gas Emissions Policy and Protocol* encourages project proponents to identify and quantify measures that would reduce or minimize GHG emissions from mobile sources and direct and indirect stationary sources (discussed below). As discussed above, as part of the Project, the Proponent has committed to physical and operational transportation mitigation measures as well as a number of TDM measures to reduce peak customer and employee traffic demand on the roadway system by encouraging alternative transportation – all of which reduce Project-related mobile source GHG emissions. The TDM measures are presented as part of the updated GHG analysis in Chapter 2, *Greenhouse Gas Emissions Analysis* of this Supplemental EIR as well as in the draft Section 61 Finding (Appendix D).

Stationary Sources

In compliance with the GHG Policy, the Proponent is committed to implementing the following building-specific improvements related to energy efficiency:

- High-efficiency Energy Star-compliant HVAC systems;
- Motion sensors and lighting in the office space in the building to reduce energy consumption (approximately 5 percent reduction of office lighting);
- White colored thermoplastic olefin (TPO) membrane roofing to reduce heat island effect on rooftop;
- Partial skylights at the garden center to reduce electrical usage; and

In addition to site and building-specific measures, the Proponent is committed to reducing GHG emissions from operations corporate-wide (at other Lowe's stores in Massachusetts and across the nation) by implementing the following programs:

- Smart Way Transport Partnership;

- Green Power Purchasing Partnership;
- Energy Demand Management;
- Energy Star-qualified products; and
- Lowe's Energy Awareness Delivers Savings (LEADS).

Refer to Chapter 2, *Greenhouse Gas Emissions Analysis* of this Supplemental EIR for the GHG emissions modeling approach and results (reductions in GHG emissions due to improvements).

Construction Management

The potential temporary impacts due to construction activities are typically related to noise, dust/air quality, soil erosion and sediment control, and truck traffic. As presented in Chapter 6, *Construction Period Impacts* of the Expanded ENF, these impacts will be minimized through a Construction Management Plan. Generally, measures to reduce construction period impacts include controlling erosion and sedimentation, controlling dust, machinery air emissions, and noise, properly managing construction-related truck traffic on Route 8.

Chapter 6, *Construction Period Impacts* of the Expanded ENF included discussion on construction debris and recycling. All construction debris will be handled, managed, and disposed of in accordance with applicable regulations. A licensed waste management contractor will be retained to transport all debris to an approved landfill/disposal facility or reclamation facility. It is anticipated that a majority of the existing steel and concrete will be recycled and that all paving removal will be trucked to an appropriate facility for recycling and reuse.

Also discussed in Chapter 6 of the Expanded ENF, the Proponent will contractually require the construction contractors to adhere to all applicable regulations regarding control of construction vehicle emissions. This will include, but not be limited to, maintenance of all motor vehicles, machinery, and equipment associated with construction activities and proper fitting of equipment with mufflers or other regulatory-required emissions control devices. Construction specifications will require that all diesel equipment used on-site will be fitted with after-engine emission controls such as oxidation catalysts or diesel particulate filters. Also, the prohibition of excessive idling of construction equipment engines (over 5 minutes), will be implemented, as required by DEP regulation 310 CMR 7.11. The Proponent will post idling restriction signs on the premises to remind drivers, patrons and delivery personnel of the state's idling regulation. Additionally, the Proponent will contractually require the construction contractors to utilize ultra-low sulfur diesel fuel for all off-road construction vehicles as an additional measure to reduce air emissions from construction activities.

Mobile Source Results – CO2 Emissions

North Adams Plaza Redevelopment - North Adams, MA

Pollutant	Annual Total CO_2 Emissions Inventory in Tons per Year 2007 Existing Condition	2012 No-Build Alternative	2012 Build Alternative	2012 Build Alternative With Mitigation
Carbon Dioxide	27,783.9	29,796.0	33,855.5	33,825.1
Difference - Existing		2,012.1	6,071.6	6,041.2
Difference - No-Build			4,059.5	4,029.1

North Adams Plaza Redevelopment - North Adams, MA

Annual Weekend CO_2 Emissions Inventory in Tons per Year

Pollutant	2007 Existing Condition	2012 No-Build Alternative	2012 Build Alternative	2012 Build Alternative With Mitigation
Carbon Dioxide	6,600.8	7,072.4	8,785.0	8,768.9
Difference - Existing		471.6	2,184.2	2,168.1
Difference - No-Build			1,712.6	1,696.5

North Adams Plaza Redevelopment - North Adams, MA

Annual Weekday CO_2 Emissions Inventory in Tons per Year

Pollutant	2007 Existing Condition	2012 No-Build Alternative	2012 Build Alternative	2012 Build Alternative With Mitigation
Carbon Dioxide	21,183.1	22,723.6	25,070.4	25,056.2
Difference - Existing		1,540.5	3,887.3	3,873.1
Difference - No-Build			2,346.8	2,332.6

Stationary Source Results – CO2 Emissions

Conversion Factors

Multiply	By	To Obtain	
Mwh	1107	lbs	(For Electricity)
Mbtu	117.08	lbs	(For Gas)
lbs	0.0005	tons	

CO2 Conversion Factors

Electricity	**1107** lb CO2/Mwh	ISO-New Elgnad Marginal Emissions Report	
Gas	**117.08** lb CO2/Mbtu	The Energy Information Administration Documentation for Emissi	136 lb CO2/Mbtu

Coverage	City	Analysis Year	Building Location
MA	Boston	2012	North Adams, MA

	File Name	Building Type	Building Area	No. of Building
Build Conditions 2012	NorthAdams_Bank_2012Build	Uinknown, Custom or Mixed Use	3,600	1
	NorthAdams_Lowes_2012Build	Retail-Warehouse Sales	155,129	1
			158,729	

Total Elec. (Mwh)	CO2 from electricity (lbs)	s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	s (tons)	TOTAL CO2 (tons)
38.61	42,741.27	21.37	132.38	15,499.05	7.75	**29.12**
1,767.30	1,956,401.10	978.20	3,180.80	372,408.06	186.20	**1,164.40**
						1,193.52

	File Name	Building Type	Building Area	No. of Building
Build Conditions w. Improvements 2012	NorthAdams_Bank_2012Build	Uinknown, Custom or Mixed Use	3,600	1
	NorthAdams_Lowes_2012Build	Retail-Warehouse Sales	155,129	1
			158,729	

Total Elec. (Mwh)	CO2 from electricity (lbs)	s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	s (tons)	TOTAL CO2 (tons)
38.61	42,741.27	21.37	132.41	15,502.56	7.75	**29.12**
1,683.90	1,864,077.30	932.04	1,968.50	230,471.98	115.24	**1,047.27**
						1,076.40

Total CO2 Emission Results (Stationary and Mobile Sources)

Existing Conditions (2006)		Build Conditions (2011)		Net Increase from No Build to Build	
CO2 from Building/Energy		CO2 from Building/Energy		CO2 from Stationary Source	
Shopping Center	730.88 tons	Bank	29.1 tons	462.6 tons	
		Lowes	1164.4 tons		
				Net Increase from No Build to Build	
				CO2 from Mobile Source	Total Yearly CO2 Emission Increase=
sum	**730.9** tons	**sum**	**1193.5 tons**	4059.5 tons	4522.1 tons
					4.5 Mega_tons

		Improved Build Conditions (2011)		Net Increase from No Build to Build	
		CO2 from Building/Energy		CO2 from Stationary Source	
		Bank	29.1 tons	345.5	
		Lowes	1047.3 tons		
				Net Increase from No Build to Improved Build	
				CO2 from Mobile Source	Total Yearly CO2 Emission Increase=
		sum	**1076.4** tons	4041.8 tons	4387.3 tons
					4.4 Mega_tons

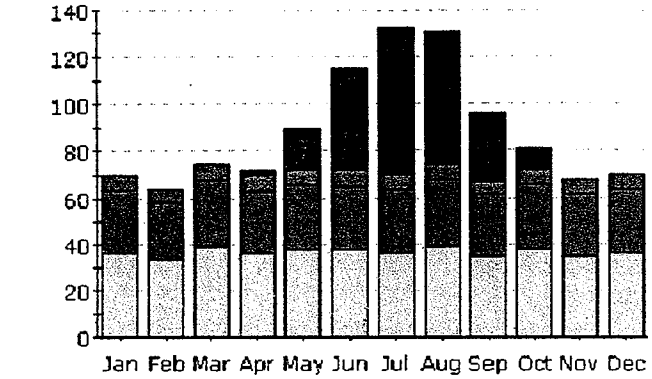
E-Quest Parameters (North Adams Plaza Redevelopment)

Parameters	2012 Build (Code Compliant)	2012 Build with Improvements
Building Location	Stockbridge	Stockbridge
Building Type	Retail	Retail
Area		
Building Area	155,129 square feet	155,129 square feet
Building Orientation	Northeast	Southeast
Cooling and Heating		
Cooling	DX Coils (EER = 8.5)	DX Coils (EER = 11.5)
Heating	Furnace (Efficiency = 0.78)	Furnace (Efficiency = 0.81)
Construction		
Roof surfaces	Metal Frame (>24in, o.c.)	No Exterior Exposure (Adiabatic)
Ground Floor		
Exposure	Earth Contact	Earth Contact
Construction	6 inch concrete	4 in concrete
Exterior Windows		
Glass Category	Double Clear/Tint	Double Low-E
Occupied Loads by Activity Area		
Office lighting (w/sq ft)	1.30	1.24

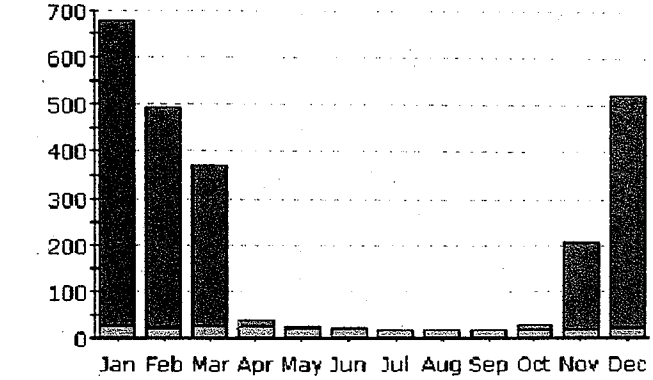
North Adams Plaza Redevelopment - Greenhouse Gas Analysis E-Quest Results
2007 Existing Condition - Shopping Center

Project/Run: North Adams_Shopping Center_07Exist - Baseline Design | Run Date/Time: 06/27/08 @ 13:35

Electric Consumption (kWh)



Gas Consumption (Btu)



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	2.7	17.7	43.4	62.2	56.5	28.8	8.7	0.6	-	220.6
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	6.5	6.0	7.0	6.5	6.7	6.7	6.5	7.0	6.2	6.7	6.2	6.5	78.4
Pumps & Aux.	0.2	0.2	0.2	0.1	0.0	0.0	-	0.0	0.0	0.1	0.1	0.2	1.1
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	26.9	24.6	28.2	26.6	27.5	27.2	26.9	28.2	25.9	27.5	25.9	26.9	322.3
Task Lights	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.6
Area Lights	36.2	33.2	38.8	36.1	37.5	37.4	36.2	38.8	34.7	37.5	34.7	36.2	437.3
Total	69.9	64.1	74.4	72.1	89.7	114.9	132.0	130.7	95.8	80.8	67.8	69.9	1,062.2

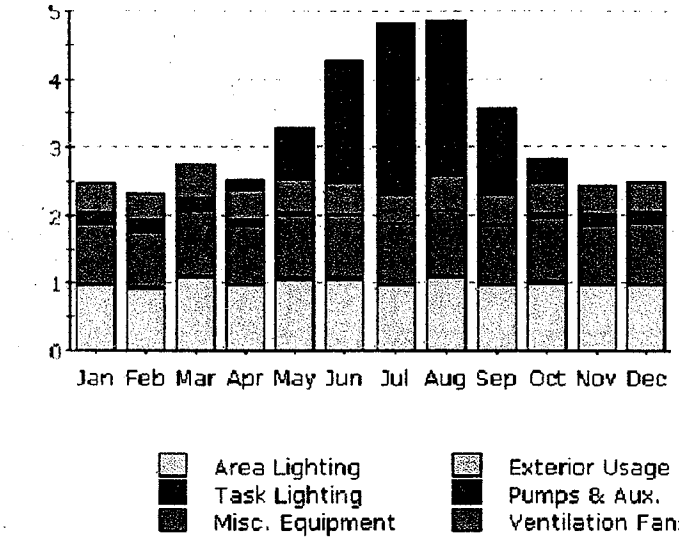
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	653.7	472.5	342.8	16.2	0.4	-	-	0.0	0.0	10.6	188.1	502.1	2,186.4
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	23.5	22.4	26.2	23.8	22.9	21.0	18.8	19.2	17.1	19.3	19.4	21.9	255.5
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	677.2	494.9	369.0	40.0	23.3	21.0	18.8	19.2	17.1	29.9	207.5	524.1	2,441.9

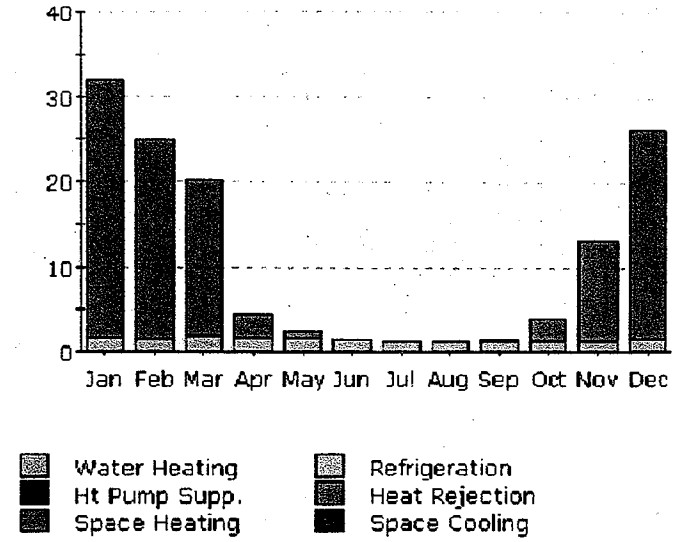
North Adams Plaza Redevelopment - Greenhouse Gas E-Quest Results
2012 Build Condition (Code Compliant) - Bank

Project/Run: North Adams_Bank_2012Build - Baseline Design | Run Date/Time: 06/27/08 @ 14:14

Electric Consumption (kWh)



Gas Consumption (Btu)



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.16	0.78	1.80	2.52	2.28	1.25	0.36	-	-	9.15
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.43	0.41	0.50	0.43	0.48	0.48	0.43	0.50	0.43	0.45	0.43	0.43	5.40
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.88	0.82	0.95	0.87	0.93	0.92	0.88	0.95	0.87	0.90	0.87	0.88	10.72
Task Lights	0.03	0.03	0.04	0.03	0.04	0.04	0.03	0.04	0.03	0.04	0.03	0.03	0.44
Area Lights	0.95	0.90	1.08	0.95	1.04	1.04	0.95	1.08	0.95	1.00	0.95	0.95	11.85
Total	2.49	2.33	2.75	2.53	3.29	4.27	4.82	4.86	3.55	2.83	2.42	2.48	38.61

Gas Consumption (Btu x000,000)

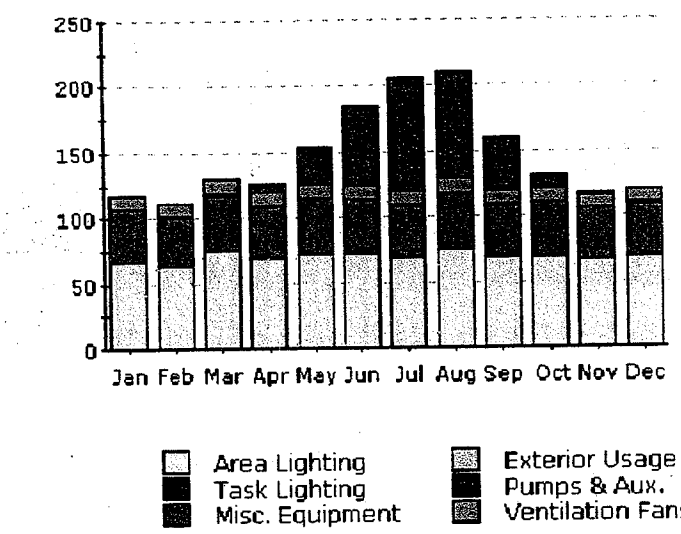
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	30.33	23.43	18.30	2.81	0.83	0.00	-	0.00	0.31	2.61	11.84	24.93	115.39
HP Supp	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.53	1.50	1.80	1.54	1.55	1.42	1.20	1.31	1.15	1.26	1.31	1.43	16.99
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	31.86	24.92	20.10	4.34	2.38	1.43	1.20	1.31	1.46	3.87	13.15	26.35	132.38

North Adams Plaza Redevelopment - Greenhouse Gas Analysis E-Quest Results
2012 Build Condition (Code Compliant) - Lowe's

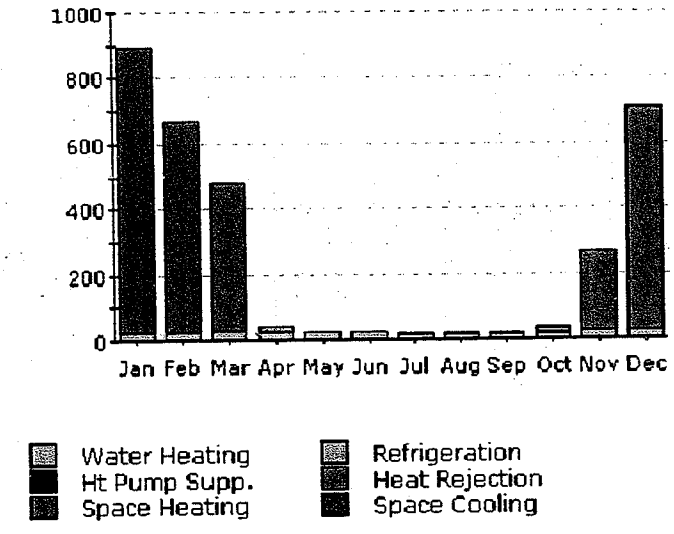
Project/Run: North Adams_Lowes_2012Build - Baseline Design

Run Date/Time: 06/27/08 @ 11:34

Electric Consumption (kWh)



Gas Consumption (Btu)



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	5.6	28.2	60.6	86.0	80.5	40.0	10.5	0.8	-	312.2
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.4	9.9	11.7	10.7	11.3	11.3	10.7	11.7	10.7	10.8	10.4	10.7	130.5
Pumps & Aux.	0.2	0.2	0.2	0.1	0.0	0.0	-	0.0	0.0	0.1	0.1	0.2	1.1
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	39.9	37.2	42.7	40.0	41.7	41.2	40.6	42.7	40.0	40.8	39.3	40.6	486.4
Task Lights	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.5
Area Lights	66.6	63.6	74.9	68.6	72.1	72.0	68.7	74.9	68.6	69.4	66.5	68.7	834.7
Total	117.3	111.0	129.7	125.2	153.6	185.3	206.2	210.1	159.5	131.8	117.3	120.4	1,767.3

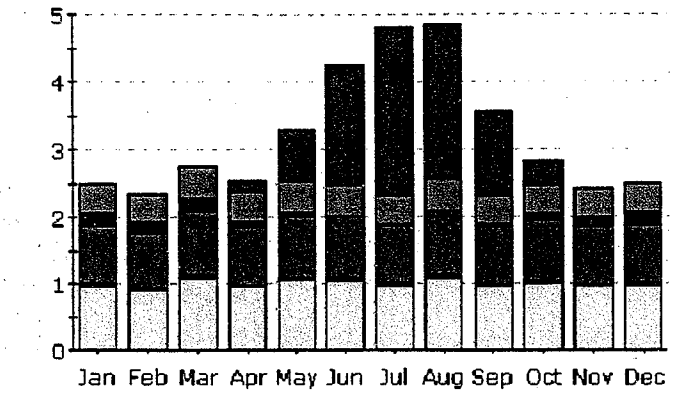
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	867.4	643.3	453.3	13.8	0.7	-	-	-	0.1	12.8	248.1	681.4	2,921.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	23.1	22.8	26.7	24.2	23.3	21.4	19.2	19.6	18.2	19.1	19.8	22.4	259.8
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	890.5	666.1	480.1	38.0	24.0	21.4	19.2	19.6	18.2	31.9	268.0	703.8	3,180.8

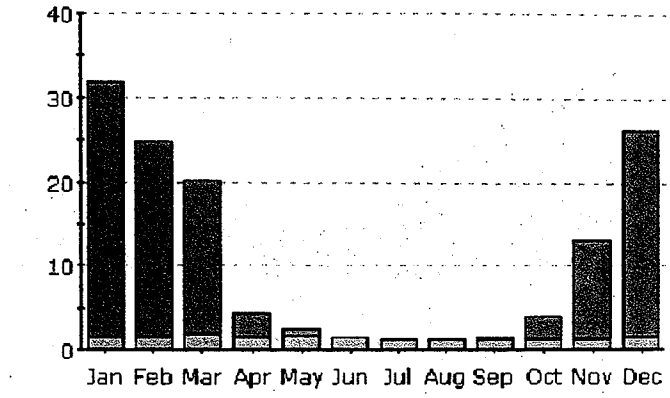
North Adams Plaza Redevelopment - Greenhouse Gas Analysis E-Quest Results
2012 Build with Improvements - Bank

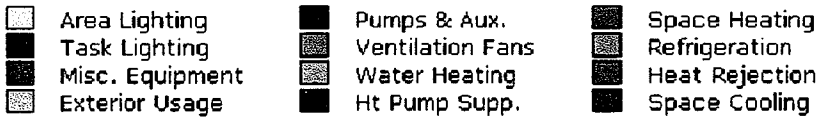
Project/Run: North Adams_Bank_2012Build_m - Baseline Design | Run Date/Time: 06/27/08 @ 14:00

Electric Consumption (kWh)



Gas Consumption (Btu)





Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.16	0.78	1.80	2.52	2.28	1.25	0.36	-	-	9.15
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.43	0.41	0.50	0.43	0.48	0.48	0.43	0.50	0.43	0.45	0.43	0.43	5.40
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.88	0.82	0.95	0.87	0.93	0.92	0.88	0.95	0.87	0.90	0.87	0.88	10.72
Task Lights	0.03	0.03	0.04	0.03	0.04	0.04	0.03	0.04	0.03	0.04	0.03	0.03	0.44
Area Lights	0.95	0.90	1.08	0.95	1.04	1.04	0.95	1.08	0.95	1.00	0.95	0.95	11.85
Total	2.49	2.33	2.75	2.53	3.29	4.27	4.82	4.86	3.55	2.83	2.42	2.48	38.61

Gas Consumption (Btu x000,000)

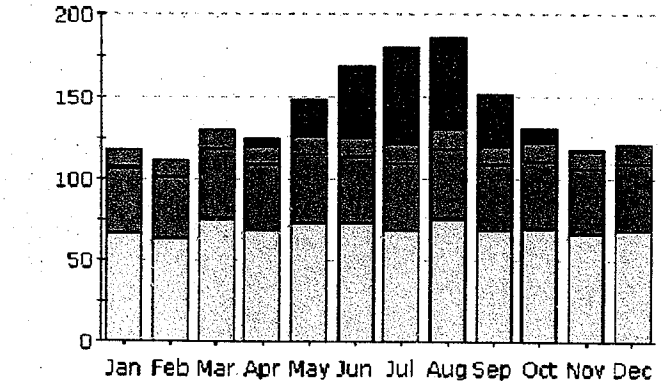
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	30.34	23.43	18.32	2.81	0.83	0.00	-	0.00	0.31	2.61	11.84	24.93	115.42
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.53	1.50	1.80	1.54	1.55	1.42	1.20	1.31	1.15	1.26	1.31	1.43	16.99
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	31.87	24.92	20.12	4.34	2.38	1.43	1.20	1.31	1.46	3.87	13.15	26.35	132.41

North Adams Plaza Redevelopment - Greenhouse Gas Analysis E-Quest Results
2012 Build with Improvements - Lowe's

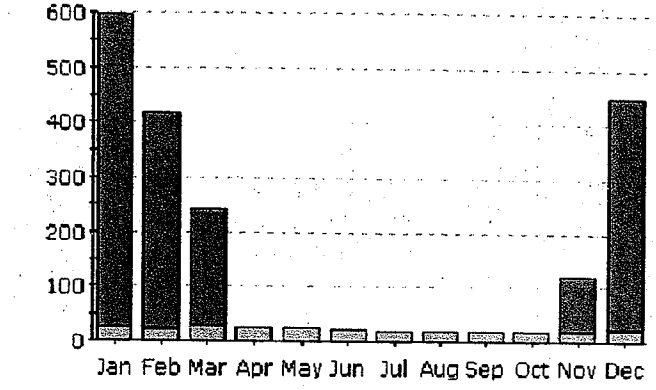
Project/Run: North Adams_Lowes_2012Build_m - Baseline Design

Run Date/Time: 06/27/08 @ 11:02

Electric Consumption (kWh)



Gas Consumption (Btu)



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	5.0	22.2	43.8	59.1	56.5	31.3	9.6	0.7	-	228.3
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	10.5	10.1	11.9	10.9	11.4	11.4	10.9	11.9	10.9	11.0	10.5	10.9	132.1
Pumps & Aux.	0.2	0.2	0.2	0.1	0.0	0.0	-	0.0	0.0	0.1	0.1	0.2	1.1
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	39.9	37.2	42.7	40.0	41.7	41.2	40.6	42.7	40.0	40.8	39.3	40.6	486.4
Task Lights	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.5
Area Lights	66.5	63.5	74.8	68.5	72.0	71.9	68.6	74.8	68.5	69.3	66.4	68.6	833.5
Total	117.3	111.0	129.8	124.6	147.7	168.6	179.3	186.1	150.8	130.9	117.3	120.4	1,683.9

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	572.7	392.4	215.5	0.0	-	-	-	-	-	0.2	101.1	427.3	1,709.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	23.0	22.7	26.6	24.1	23.3	21.4	19.2	19.6	18.1	19.0	19.8	22.3	259.2
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	595.8	415.2	242.1	24.2	23.3	21.4	19.2	19.6	18.1	19.2	120.8	449.6	1,968.5

Additional Project Improvements

Lowe's Greenhouse Gas Awareness Program

Stationary

Greenhouse Gas Reduction Program	Reduction in CO2 Emissions (in tons/yr)
Green Power Purchase Power	18.64
Lowe's Energy Management Program	4.57
Total Reduction in CO2 Emissions (in tons/yr)	**23.21**

Mobile

Greenhouse Gas Reduction Program	Total Reduction in CO2 Emissions (in tons/yr)
Smartway Program	11.22
Total Reduction in CO2 Emissions (in tons/yr)	**11.22**

Other

Greenhouse Gas Reduction Program	Total Reduction in CO2 Emissions (in tons/yr)
PV Cells	34.41
Total Reduction in CO2 Emissions (in tons/yr)	**34.41**

Lowe's Greenhouse Gas Awareness Program

Green Power Purchase Power	
Total Electric Consumption (Mwh/yr)	1,683.9
Total Electric Consumption (tons/yr)	932.0
Percent Reduction	2%
Total CO2 Emission Reduction in tons/yr	18.64
Total CO2 Emission after Reduction (tons/yr)	913.4

Lowe's Greenhouse Gas Awareness Program

Energy Management Program	
Total CO2 Emission after Green Power Purchase Program (tons/yr)	913.4
Percent Reduction	0.5%
Total CO2 Emission Reduction in tons/yr	4.57
Total CO2 Emission after Reduction (tons/yr)	908.8

Lowe's Greenhouse Gas Awareness Program

Trucking Program	
Number of Trucks	730
Distance Travelled (miles/year)	250
Emission Factor (g/mile at 65mph)	557.53
Total CO2 Emissions (kg/yr)	101,749
Total CO2 Emissions in tons/yr	**112.2**
Percent Reduction	10%
Total CO2 Reduction (tons/yr)	**11.22**
Total CO2 Emissions after Reduction (tons/yr)	**100.94**

Lowe's recognized for green solutions

The Environmental Protection Agency and the Department of Energy recognized Lowe's for its efforts to protect the environment.

The agencies recently honored Lowe's with the 2008 ENERGY STAR® Award for Excellence in Retail Commitment. The award is given to the retailer successfully promotir and delivering ENERGY STAR®-qualified products and projects, saving consumers mon and reducing greenhouse gas emissions. This is the sixth consecutive year Lowe's earned ENERGY STAR® award. More than 9,000 organizations participate in the program.

As an ENERGY STAR® partner since 2001, Lowe's is raising awareness of energy-efficient products and projects for homeowners in a number of ways, including promoting the use of compact fluorescent light bulbs and new energy-efficient technologies.

Lowe's was also recently recognized as one of the top Fortune 500 companies to surpas the EPA's Green Power Partnership goals in purchasing green power. Lowe's ranked 16th among Fortune 500 companies in the purchase of green power and seventh among all retailers. In 2007, Lowe's increased its green purchasing power to 86 million kilowatt hou up from 7.9 million in 2006.

Green power is generated from renewable resources such as solar, wind, geothermal, biomass and biogas, as well as low-impact hydropower.

Also in 2007, EPA's SmartWay Transport Partnership awarded Lowe's its first Environmental Excellence award for our leadership in conserving energy and lowering greenhouse gas emissions from our transportation and freight delivery system. With 85 percent of our shipments going by SmartWay Transport Partners, our transportation tea is well on its way to meet our 2010 goal of 90 percent total shipments.

LEADS
Lowe's Energy Awareness Delivers Savings

What is LEADS?
LEADS is the newly developed Lowe's energy awareness program designed to foster & facilitate good practices regarding energy & water consumption. The objectives of LEADS are to reduce energy consumption and conserve natural resources with the primary goal of reducing our operational costs. All Lowe's employees will have the opportunity to help control energy & water consumption and expense. Energy and maintenance standards have been developed for Lowe's stores to effect a reduction in energy & water consumption. Each store will be given a checklist that includes items of energy consuming opportunities, which are then focused into a reporting mechanism to deliver energy reduction results.

LEADS provides practical management guidelines for stores to help control consumption in areas such as interior lighting systems, HVAC systems, parking lot and security lighting, irrigation and domestic water systems, all without negatively impacting quality.

Why is LEADS Important?
By being "energy aware" and proactively responding to operational anomalies, we all can help save Lowe's millions of dollars each year. LEADS supports Lowe's belief that a quality designed and implemented energy and water savings program will provide a 2% - $10 million savings goal along with a positive environmental benefit.

The program recognizes the value added contributions of participating stores in better managing its operations. More importantly, a participating store has a positive affect to its profit and loss statement and is a good neighbor to its local customers and the world in reducing green house gas emissions and helping sustain community water supplies.

Who is the LEADS contact at the Store?
The liaison at the participating stores is the Administrative Manager (ADM). The ADM has been selected because of their understanding of the store's finances & budget and is aware of the general layout, energy and water using equipment and locations along with areas of concerns.

Where Will LEADS be conducted?
LEADS will involve participating stores and Lowe's Energy Management Department. The participating store will be provided LEADS energy savings documents, including a checklist, educational materials, Factoids, and associated reports. The ADMs and designated store personnel will determine electrical and water (natural gas if appropriate) maintenance issues and to look for energy anomalies on-site during normal business hours. A night audit / Dark Store Audit may be used to determine if additional energy conservation issues exist as required at the team's discretion.

At the Lowe's Energy Management Department, a complete energy & water consumption analysis will be performed, including establishing baseline consumption and trending of stores consumption over the past year. This analysis will be provided to the participating stores on an on-going basis to monitor progress of program success.

LEADS is a great way to get everyone at Lowe's involved with reducing energy and water waste. With the growing strain on our environment we need to do our part in reducing greenhouse gas emissions and water waste. Many areas of the country are in the midst of droughts. If Lowe's can do its part to help the environment it is a win-win for everyone.

Lowe's Greenhouse Gas Awareness Program

PV Cells	Kwh/month
Electric Consumption (kwh/month)	5,180
Electric Consumption (tons/yr)	34.4

DRAFT 5.0 Non-Residential Solar Photovoltaic Project Simple Financial Model (02/07/08)
DATA ENTRY AND FINANCIAL SUMMARY

Key

Entry Cells	
Cells Draw Data from Another Worksheet	
Calculation Cells (Not for Entry)	

Select Taxable or Non-Taxable Entity

Project and Customer Cost Assumptions

Solar Photovoltaic System Size	50,000	Watts (DC STC)
Total System Cost/Watt	$ 7.50	$/Watt (DC STC)
Total System Cost	$ 375,000	

MTC Rebate Assumptions

MTC Scenario A: Non-Taxable Rebate	$ 3.125	$/Watt (DC STC)
Scenario A Rebate	$ 156,250	
MTC Scenario B: Taxable Rebate	$ 3.125	$/Watt (DC STC)
Scenario B Rebate	$ 156,250	

Project Performance and Savings/ Cost Assumptions

Annual Net Capacity Factor	14.1%	kW (DC STC) to kWh AC
Annual Production Degradation	0.5%	%
Project Life	25	Years
Electricity Revenue (Avoided Costs)	$ 0.035	$/kWh
Electricity Revenue (Avoided Costs) Annual Adjustor	3.0%	%
Renewable Energy Certificate (REC) Revenue	$ 0.015	$/kWh
REC Revenue Annual Adjustor	0.0%	%
REC Revenue Term	15	Years (must be equal to or less than project life)
Annual Operations and Maintenance Cost	$ 750	$/Year
Annual Operations and Maintenance Adjustor	3.0%	%
Future Inverter Replacement Cost	$ 0.75	$/Watt (DC STC)
Inverter Life, Replace Every X Years	15	Year (must be equal to or less than project life)

Scenario Definitions

Scenario A: Non-Taxable Rebate - Assumes that the state rebate is non-taxable, but is subtracted from the cost basis for purposes of determining tax credits and accelerated depreciation.

Scenario B: Taxable Rebate - Assumes that the state rebate is taxable, but is not subtracted from the cost basis for purposes of determining tax credits and accelerated depreciation.

Both Scenarios assume that the project owner can use both federal and state tax benefits

Tax Assumptions

Federal Tax Rate	35%					
State Tax Rate	6%					
Effective Tax Rate	41%					
Federal Tax Credit	30%					
State Tax Deduction	100%					
5 Year Accelerated Depreciation Schedule (MACRS)	20.00%	32.00%	19.20%	11.52%	11.52%	5.76%

Financing Assumptions

% Financed w/ Cash	100%	
% Financed w/ Loan	0%	
Loan Interest Rate	8.0%	
Loan Period	10	Years (must be equal to or less than project life)
Scenario A Net Cost	$ 218,750	
Scenario A Loan	$ -	
Scenario B Net Cost	$ 218,750	
Scenario B Loan	$ -	
Customer Discount Rate	8.0%	

Solar Project Financial Analysis Summary	
Scenario A Net Present Value	$ (29,321)
Scenario A Simple Payback (100% Cash Only)	Year 12
Scenario A Internal Return on Equity	8.5%
Scenario A Cash on Cash Return on Equity	8.5%
Scenario B Net Present Value	$ 5,191
Scenario B Simple Payback (100% Cash Only)	Year 9
Scenario B Internal Return on Equity	8.6%
Scenario B Cash on Cash Return on Equity	8.5%

Interested in learning more about the financial implications of the purchase and installation of solar energy equipment are urged to consult their own tax and financial experts. The information contained in the Unofficial Cash Flow Model may not be relied on by anyone for any purposes. Furthermore, the information contained in this model does not necessarily reflect the views of the Massachusetts Technology Collaborative or the Commonwealth of Massachusetts, and reference to any specific method does not constitute an implied or expressed recommendation or endorsement of it. Neither the Massachusetts Technology Collaborative nor the Commonwealth of Massachusetts make any warranties or representations, expressed or implied, as to the usefulness, completeness, or accuracy of any processes, methods or other information contained, described, disclosed, or referred to in this model. Finally, neither the Massachusetts Technology Collaborative nor the Commonwealth of Massachusetts makes any representation that the use of any product, apparatus, process, method, or other information will not infringe privately owned property rights and assumes no liability of any kind or nature for any loss, injury, or damage directly or indirectly resulting from, or occurring in connection with, the use of information contained, described, disclosed, or referred to in this Unofficial Cash Flow Model.

DRAFT 5.0 Non-Residential Solar Photovoltaic Project Simple Financial Model (02/07/08)
DATA ENTRY AND FINANCIAL SUMMARY

Key

Entry Cells	
Cells Draw Data from Another Worksheet	
Calculation Cells (Not for Entry)	

Select Taxable or Non-Taxable Entity

Project and Customer Cost Assumptions

Solar Photovoltaic System Size	50,000	Watts (DC STC)
Total System Cost/Watt	$ 7.50	$/Watt (DC STC)
Total System Cost	$ 375,000	

MTC Rebate Assumptions

MTC Scenario A: Non-Taxable Rebate	$ 3.125	$/Watt (DC STC)
Scenario A Rebate	$ 156,250	
MTC Scenario B: Taxable Rebate	$ 3.125	$/Watt (DC STC)
Scenario B Rebate	$ 156,250	

Project Performance and Savings/ Cost Assumptions

Annual Net Capacity Factor	12.0%	kW (DC STC) to kWh AC
Annual Production Degradation	0.5%	%
Project Life	25	Years
Electricity Revenue (Avoided Costs)	$ 0.15	$/kWh
Electricity Revenue (Avoided Costs) Annual Adjustor	3.0%	%
Renewable Energy Certificate (REC) Revenue	$ 0.04	$/kWh
REC Revenue Annual Adjustor	0.0%	%
REC Revenue Term	5	Years (must be equal to or less than project life)
Annual Operations and Maintenance Cost	$ 250	$/Year
Annual Operations and Maintenance Adjustor	3.0%	%
Future Inverter Replacement Cost	$ 0.75	$/Watt (DC STC)
Inverter Life, Replace Every X Years	15	Year (must be equal to or less than project life)

Scenario Definitions

Scenario A: Non-Taxable Rebate - Assumes that the state rebate is non-taxable, but is subtracted from the cost basis for purposes of determining tax credits and accelerated depreciation.

Scenario B: Taxable Rebate - Assumes that the state rebate is taxable, but is not subtracted from the cost basis for purposes of determining tax credits and accelerated depreciation.

Both Scenarios assume that the project owner can use both federal and state tax benefits

Tax Assumptions

Federal Tax Rate	35%
State Tax Rate	6%
Effective Tax Rate	41%
Federal Tax Credit	30%
State Tax Deduction	100%
5 Year Accelerated Depreciation Schedule (MACRS)	20.00% 32.00% 19.20% 11.52% 11.52% 5.76%

Financing Assumptions

% Financed w/ Cash	100%	
% Financed w/ Loan	0%	
Loan Interest Rate	8%	
Loan Period	20	Years (must be equal to or less than project life)
Scenario A Net Cost	$ 218,750	
Scenario A Loan	$ -	
Scenario B Net Cost	$ 218,750	
Scenario B Loan	$ -	
Customer Discount Rate	8%	

Solar Project Financial Analysis Summary	
Scenario A: Net Present Value	$ (26,321)
Scenario A: Simple Payback (100% Cash only)	Year 12
Scenario A: Estimated Return on Equity	6.3%
Scenario A: Guess Return on Equity	8.0%
Scenario B: Net Present Value	$ 5,159
Scenario B: Simple Payback (100% Cash only)	Year 6
Scenario B: Estimated Return on Equity	8.6%
Scenario B: Guess Return on Equity	8.0%

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DRAFT 5.0 Non-Residential Solar Photovoltaic Project Simple Financial Model (02/07/08)
PRO FORMA AND PRODUCTION

Project Output	Start-Up 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Annual Generation (kWh)		61,320	61,013	60,708	60,405	60,103	59,802	59,503	59,206	58,910	58,615	58,322	58,030	57,740	57,452	57,164	56,879	56,594	56,311	56,030	55,749
Scenario A: Non-Taxable Rebate; Pro Forma Project Economics																					
INCOME STATEMENT																					
Electricity Revenue (Avoided Cost)		$ 9,198	$ 9,427	$ 9,661	$ 9,901	$ 10,147	$ 10,399	$ 10,657	$ 10,922	$ 11,194	$ 11,472	$ 11,757	$ 12,049	$ 12,349	$ 12,655	$ 12,970	$ 13,292	$ 13,623	$ 13,961	$ 14,308	$ 14,664
REC Revenue		$ 1,533	$ 1,525	$ 1,518	$ 1,510	$ 1,503	$ 1,495	$ 1,488	$ 1,480	$ 1,473	$ 1,465	$ 1,458	$ 1,451	$ 1,444	$ 1,436	$ 1,429	$ -	$ -	$ -	$ -	$ -
Total Revenue (Avoided Costs)		$ 10,731	$ 10,952	$ 11,179	$ 11,411	$ 11,649	$ 11,894	$ 12,145	$ 12,402	$ 12,666	$ 12,937	$ 13,215	$ 13,500	$ 13,792	$ 14,092	$ 14,399	$ 13,292	$ 13,623	$ 13,961	$ 14,308	$ 14,664
Operations & Maintenance Costs		$ (250)	$ (258)	$ (265)	$ (273)	$ (281)	$ (290)	$ (299)	$ (307)	$ (317)	$ (326)	$ (336)	$ (346)	$ (356)	$ (367)	$ (378)	$ (389)	$ (401)	$ (413)	$ (426)	$ (438)
Inverter Replacement Cost		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (37,500)	$ -	$ -	$ -	$ -	$ -
Total Operating Expenses		$ (250)	$ (258)	$ (265)	$ (273)	$ (281)	$ (290)	$ (299)	$ (307)	$ (317)	$ (326)	$ (336)	$ (346)	$ (356)	$ (367)	$ (37,878)	$ (389)	$ (401)	$ (413)	$ (426)	$ (438)
EBITDA		$ 10,481	$ 10,694	$ 10,913	$ 11,138	$ 11,368	$ 11,604	$ 11,847	$ 12,095	$ 12,350	$ 12,611	$ 12,879	$ 13,154	$ 13,436	$ 13,725	$ (23,479)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Federal Depreciation Expense		$ (37,188)	$ (59,500)	$ (35,700)	$ (21,420)	$ (21,420)	$ (10,710)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
EBIT		$ (26,707)	$ (48,806)	$ (24,787)	$ (10,282)	$ (10,052)	$ 894	$ 11,847	$ 12,095	$ 12,350	$ 12,611	$ 12,879	$ 13,154	$ 13,436	$ 13,725	$ (23,479)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Interest Expense		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
EBT		$ (26,707)	$ (48,806)	$ (24,787)	$ (10,282)	$ (10,052)	$ 894	$ 11,847	$ 12,095	$ 12,350	$ 12,611	$ 12,879	$ 13,154	$ 13,436	$ 13,725	$ (23,479)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Federal taxes saved/(paid)		$ 9,677	$ 17,419	$ 9,019	$ 3,950	$ 3,876	$ 53	$ (3,773)	$ (3,852)	$ (3,933)	$ (4,017)	$ (4,102)	$ (4,190)	$ (4,279)	$ (4,371)	$ 8,218	$ (4,110)	$ (4,211)	$ (4,315)	$ (4,422)	$ (4,531)
State taxes saved/(paid) [can not deduct federal depreciation expense]		$ (943)	$ (962)	$ (982)	$ (1,002)	$ (1,023)	$ (1,044)	$ (1,066)	$ (1,089)	$ (1,111)	$ (1,135)	$ (1,159)	$ (1,184)	$ (1,209)	$ (1,235)	$ 2,113	$ (1,161)	$ (1,190)	$ (1,219)	$ (1,249)	$ (1,280)
Net Income		$ (17,972)	$ (32,349)	$ (16,750)	$ (7,335)	$ (7,199)	$ (98)	$ 7,007	$ 7,154	$ 7,305	$ 7,459	$ 7,618	$ 7,781	$ 7,947	$ 8,118	$ (13,148)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
CASH FLOW STATEMENT																					
Cash From Operations																					
Net Income		$ (17,972)	$ (32,349)	$ (16,750)	$ (7,335)	$ (7,199)	$ (98)	$ 7,007	$ 7,154	$ 7,305	$ 7,459	$ 7,618	$ 7,781	$ 7,947	$ 8,118	$ (13,148)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Federal Depreciation Expense		$ 37,188	$ 59,500	$ 35,700	$ 21,420	$ 21,420	$ 10,710	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash Flow From Operations		$ 19,215	$ 27,151	$ 18,950	$ 14,085	$ 14,221	$ 10,612	$ 7,007	$ 7,154	$ 7,305	$ 7,459	$ 7,618	$ 7,781	$ 7,947	$ 8,118	$ (13,148)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Cash From Investing																					
Installed PV Cost	$ (218,750)																				
One Time State Solar Investment Tax Deduction (Actual Cash Value)		$ 12,797																			
One Time Federal Solar Investment Tax Credit		$ 65,625																			
Cash Flow From Investing	$ (218,750)	$ 78,422	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash From Financing																					
Loan Disbursement	$ -																				
Loan Repayment (Principle)		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash Flow From Financing	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Cash Flow	$ (218,750)	$ 97,637	$ 27,151	$ 18,950	$ 14,085	$ 14,221	$ 10,612	$ 7,007	$ 7,154	$ 7,305	$ 7,459	$ 7,618	$ 7,781	$ 7,947	$ 8,118	$ (13,148)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Cumulative Cash Flow	$ (218,750)	$ (121,113)	$ (93,962)	$ (75,012)	$ (60,927)	$ (46,706)	$ (36,093)	$ (29,086)	$ (21,932)	$ (14,627)	$ (7,167)	$ 450	$ 8,231	$ 16,178	$ 24,296	$ 11,148	$ 18,780	$ 26,600	$ 34,614	$ 42,825	$ 51,240
Scenario B: Taxable Rebate; Pro Forma Project Economics																					
INCOME STATEMENT																					
Electricity Revenue (Avoided Cost)		$ 9,198	$ 9,427	$ 9,661	$ 9,901	$ 10,147	$ 10,399	$ 10,657	$ 10,922	$ 11,194	$ 11,472	$ 11,757	$ 12,049	$ 12,349	$ 12,655	$ 12,970	$ 13,292	$ 13,623	$ 13,961	$ 14,308	$ 14,664
REC Revenue		$ 1,533	$ 1,525	$ 1,518	$ 1,510	$ 1,503	$ 1,495	$ 1,488	$ 1,480	$ 1,473	$ 1,465	$ 1,458	$ 1,451	$ 1,444	$ 1,436	$ 1,429	$ -	$ -	$ -	$ -	$ -
Total Revenue (Avoided Costs)		$ 10,731	$ 10,952	$ 11,179	$ 11,411	$ 11,649	$ 11,894	$ 12,145	$ 12,402	$ 12,666	$ 12,937	$ 13,215	$ 13,500	$ 13,792	$ 14,092	$ 14,399	$ 13,292	$ 13,623	$ 13,961	$ 14,308	$ 14,664
Operations & Maintenance Costs		$ (250)	$ (258)	$ (265)	$ (273)	$ (281)	$ (290)	$ (299)	$ (307)	$ (317)	$ (326)	$ (336)	$ (346)	$ (356)	$ (367)	$ (378)	$ (389)	$ (401)	$ (413)	$ (426)	$ (438)
Inverter Replacement Cost		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (37,500)	$ -	$ -	$ -	$ -	$ -
Total Operating Expenses		$ (250)	$ (258)	$ (265)	$ (273)	$ (281)	$ (290)	$ (299)	$ (307)	$ (317)	$ (326)	$ (336)	$ (346)	$ (356)	$ (367)	$ (37,878)	$ (389)	$ (401)	$ (413)	$ (426)	$ (438)
EBITDA		$ 10,481	$ 10,694	$ 10,913	$ 11,138	$ 11,368	$ 11,604	$ 11,847	$ 12,095	$ 12,350	$ 12,611	$ 12,879	$ 13,154	$ 13,436	$ 13,725	$ (23,479)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Federal Depreciation Expense		$ (63,750)	$ (102,000)	$ (61,200)	$ (36,720)	$ (36,720)	$ (18,360)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
EBIT		$ (53,269)	$ (91,306)	$ (50,287)	$ (25,582)	$ (25,352)	$ (6,756)	$ 11,847	$ 12,095	$ 12,350	$ 12,611	$ 12,879	$ 13,154	$ 13,436	$ 13,725	$ (23,479)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Interest Expense		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
EBT		$ (53,269)	$ (91,306)	$ (50,287)	$ (25,582)	$ (25,352)	$ (6,756)	$ 11,847	$ 12,095	$ 12,350	$ 12,611	$ 12,879	$ 13,154	$ 13,436	$ 13,725	$ (23,479)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Federal taxes saved/(paid)		$ 18,974	$ 32,294	$ 17,944	$ 9,305	$ 9,231	$ 2,730	$ (3,773)	$ (3,852)	$ (3,933)	$ (4,017)	$ (4,102)	$ (4,190)	$ (4,279)	$ (4,371)	$ 8,218	$ (4,110)	$ (4,211)	$ (4,315)	$ (4,422)	$ (4,531)
State taxes saved/(paid) [can not deduct federal depreciation expense]		$ (943)	$ (962)	$ (982)	$ (1,002)	$ (1,023)	$ (1,044)	$ (1,066)	$ (1,089)	$ (1,111)	$ (1,135)	$ (1,159)	$ (1,184)	$ (1,209)	$ (1,235)	$ 2,113	$ (1,161)	$ (1,190)	$ (1,219)	$ (1,249)	$ (1,280)
Federal and State Tax on MTC Capital Cost Rebate		$ (63,828)																			
Net Income		$ (99,066)	$ (59,974)	$ (33,325)	$ (17,280)	$ (17,144)	$ (5,070)	$ 7,007	$ 7,154	$ 7,305	$ 7,459	$ 7,618	$ 7,781	$ 7,947	$ 8,118	$ (13,148)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
CASH FLOW STATEMENT																					
Cash From Operations																					
Net Income		$ (99,066)	$ (59,974)	$ (33,325)	$ (17,280)	$ (17,144)	$ (5,070)	$ 7,007	$ 7,154	$ 7,305	$ 7,459	$ 7,618	$ 7,781	$ 7,947	$ 8,118	$ (13,148)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Federal Depreciation Expense		$ 63,750	$ 102,000	$ 61,200	$ 36,720	$ 36,720	$ 18,360	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash Flow From Operations		$ (35,316)	$ 42,026	$ 27,875	$ 19,440	$ 19,576	$ 13,290	$ 7,007	$ 7,154	$ 7,305	$ 7,459	$ 7,618	$ 7,781	$ 7,947	$ 8,118	$ (13,148)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Cash From Investing																					
Installed PV Cost	$ (218,750)																				
One Time State Solar Investment Tax Deduction (Actual Cash Value)		$ 21,938																			
One Time Federal Solar Investment Tax Credit		$ 112,500																			
Cash Flow From Investing	$ (218,750)	$ 134,438	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash From Financing																					
Loan Disbursement	$ -																				
Loan Repayment (Principle)		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash Flow From Financing	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Net Cash Flow	$ (218,750)	$ 99,121	$ 42,026	$ 27,875	$ 19,440	$ 19,576	$ 13,290	$ 7,007	$ 7,154	$ 7,305	$ 7,459	$ 7,618	$ 7,781	$ 7,947	$ 8,118	$ (13,148)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Cumulative Cash Flow	$ (218,750)	$ (119,629)	$ (77,603)	$ (49,728)	$ (30,288)	$ (10,711)	$ 2,579	$ 9,586	$ 16,740	$ 24,045	$ 31,504	$ 39,122	$ 46,903	$ 54,850	$ 62,968	$ 49,820	$ 57,452	$ 65,272	$ 73,286	$ 81,497	$ 89,911

DRAFT 5.0 Non-Residential Solar Photovoltaic Project Simple Financial Model (02/07/08)
DEBT SCHEDULES

Scenario A Loan: Debt Schedule	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Debt Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Principle	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interest	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Ending Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Scenario B Loan: Debt Schedule	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Debt Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Principle	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interest	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Ending Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

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Buckley, Deirdre (EEA)

From: DeVoe, Lauren [LDeVoe@vhb.com]
Sent: Wednesday, October 01, 2008 11:48 AM
To: Buckley, Deirdre (EEA)
Cc: Wholley, Tom
Subject: FW: North Adams TDM Backup
Attachments: Commuter Model North Adams.pdf

Hello Deirdre,
Attached is the COMMUTER model back-up for the GHG reductions related to TDM measures to supplement Appendix C. I will plan to distribute this to the full Supp. EIR Distribution List today.

Once Tom Wholley, our air quality specialist, is back in the office we will give you a call to answer your other questions, per your voicemail.

Thank you,
Lauren

From: Richards, Heidi
Sent: Wednesday, October 01, 2008 11:42 AM
To: DeVoe, Lauren
Subject: North Adams TDM Backup

Hi Lauren-

Attached is the .pdf of the Commuter Model Results that was run for North Adams for the TDM GHG Reduction Estimate. I apologize for not seeing that it wasn't in there.

-Heidi U. Richards, P.E.

Project Manager/Transportation Engineer
Transportation Planning and Operations Group

VHB/Vanasse Hangen Brustlin, Inc.
101 Walnut Street
Watertown, MA 02471
617.924.1770

COMMUTER MODEL RESULTS

SCENARIO INFORMATION

Description	Lowes North Adams2
Scenario Filename	lowes-nadams2.vme
Emission Factor File	
Performing Agency	VHB
Analyst	Robert Ricchi
Metropolitan Area	North Adams, MA
Area Size	3 - Small (under 750,000)
Analysis Scope	2 - Site or Employer-Based
Analysis Area/Site	shopping center
Total Employment	175

PROGRAMS EVALUATED

X	Site Walk Access Improvements
X	Transit Service Improvements
	Financial Incentives
X	Employer Support Programs
	Alternative Work Schedules
	User-Supplied Final Mode Shares

MODE SHARE IMPACTS

Mode	Baseline	Final	%Change
Drive Alone	78.2%	77.2%	-1.0%
Carpool	12.1%	12.5%	+0.4%
Vanpool	0.5%	0.5%	-0.0%
Transit	4.9%	5.3%	+0.5%
Bicycle	0.4%	0.5%	+0.1%
Pedestrian	3.0%	3.1%	+0.1%
Other	0.8%	0.8%	-0.0%
No Trip	-	0.0%	+0.0%
Total	100.0%	100.0%	-

Shifted from Peak to Off-Peak	0.0%

TRAVEL IMPACTS (relative to affected employment)

Quantity	Peak	Off-Peak	Total
Baseline VMT	2,257	1,419	3,676
Final VMT	2,238	1,407	3,646
VMT Reduction	19	12	30
% VMT Reduction	0.8%	0.8%	0.8%
Baseline Trips	180	113	293
Final Trips	178	112	290
Trip Reduction	2	1	3
% Trip Reduction	1.0%	1.0%	1.0%

No agency comments on GHG

The Commonwealth of Ma
Executive Office of Energy and Envi
100 Cambridge Street, Sui
Boston, MA 02114

Deval L. Patrick
GOVERNOR

Timothy P. Murray
LIEUTENANT GOVERNOR

Ian A. Bowles
SECRETARY

Fax: (617) 626-1181
http://www.mass.gov/envir

May 9, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Bulfinch Triangle Project
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 14194
PROJECT PROPONENT	: Hines Raymond LLC
DATE NOTICED IN MONITOR	: March 12, 2008

Pursuant to the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and Section 11.11 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Expanded Environmental Notification Form (EENF) for this project and hereby determine that it requires the preparation of a Single Environmental Impact Report (EIR).

Project Description

As described in the EENF, the project consists of the design and construction of a 488,000 gross square foot (sf) mixed-use development on a 1.46 acre parcel in the Bulfinch Triangle. It will include a 57,000 sf supermarket, 6,000 sf of ground floor retail uses, approximately 295,000 sf of either commercial office space or research and development (R&D) space and a 200-space parking garage (on two floors). The site includes parcel 2A, 2B and 2C. Parcel 2A and 2C are owned by the Massachusetts Turnpike Authority (MTA). Parcel 2B is owned by the Massachusetts Bay Transportation Authority (MBTA).

The site is bounded by Canal Street (including the existing Terra Cotta Building), Valenti Way, Beverly Street, North Washington Street and New Chardon Street. It is located on landlocked tidelands approximately 940 feet from Boston Inner Harbor on the landward side of Commercial Street in a mixed use area that includes entertainment, retail and residential uses. It is located within the City of Boston Groundwater Conservation Overlay District. Parcel 2C is

located within the boundaries of the Bulfinch Triangle Historic District which is listed in the National and State Registers of Historic Places. Parcel 2A and 2B are located adjacent to the Bulfinch Triangle Historic District and the Causeway/North Washington Street Historic District which meets the criteria of eligibility for listing in the National Register of Historic Places. Parcel 2B and 2C are located adjacent to the Canal Street building (also referred to as the Terra Cotta building) which is a contributing resource in the Bulfinch Triangle Historic District. The site contains a MBTA Transformer Vault and MBTA Vent Building and is located over MBTA tunnels and MTA tunnels. Access to the MBTA Green/Orange Line Superstation is located across Valenti Street and access to the MBTA Haymarket Station, including bus service, is located across New Chardon Street. Also, it is located in close proximity to the commuter rail at North Station. The proponent will lease the site from the MBTA and the MTA through separate 99-year ground leases.

Permitting/Jurisdiction

The project is undergoing MEPA review and subject to preparation of mandatory Environmental Impact Report (EIR) pursuant to Section 11.03 (6)(a)(6) because it requires a state permit and will generate 3,000 or more new average daily vehicle trips (adt). The project requires a ground lease from the MTA and a ground lease for land and air rights from the MBTA. The project requires review by the Massachusetts Historical Commission (MHC). The project may require a Sewer Connection Permit from the Department of Environmental Protection (MassDEP) and a Sewer Use Discharge Permit from the Massachusetts Water Resources Authority (MWRA).

The project requires surplus approval, approval of non-highway use of Right-of-Way (ROW) and Section 106 review by the US Department of Transportation's (DOT) Federal Highway Administration (FHWA). Also, it requires a National Pollution Discharge Elimination System (NPDES) Construction General Permit from the US Environmental Protection Agency (EPA).

The project is subject to Article 80 Large Project Review by the Boston Redevelopment Authority (BRA) which has been coordinated with the MEPA review. It requires review by the Boston Civic Design Commission (BCDC), development of a Transportation Access Plan Agreement (TAPA) and Construction Management Plan (CMP) for review by the Boston Transportation Department (BTD), Site Plan Approval and Utility Connection Permits by the Boston Water and Sewer Commission (BWSC), review by the Boston Public Improvements Commission (PIC), Curb Cut Permits and Street Occupancy Permits from the Boston Public Works Department (PWD), review by the Boston Air Pollution Control Commission (BAPCC), a permit to operate a parking garage and fuel storage license from the Boston Committee on Licenses, a Building Permit from the Boston Inspectional Services Department and review by the Boston Landmarks Commission (BLC). In addition, it requires zoning relief from the Boston Redevelopment Authority.[1]

[1]The project requires zoning relief for height and accessory office parking. It requires confirmation that the supermarket is an allowed use. In the event that the project does include R&D uses, the project will require additional zoning relief because R&D is not considered an allowed use.

Because the proponent is seeking a land transfer, in the form of a ground lease, MEPA jurisdiction extends to those aspects of the project within the area subject to the land transfer that are likely, directly or indirectly, to cause Damage to the Environment. Pursuant to 301 CMR 11.01(2)(a)(3), MEPA subject matter jurisdiction is functionally equivalent to full scope jurisdiction.

Potential Environmental Impacts

Potential environmental impacts are associated with the generation of approximately 9,342 average daily vehicle trips (adt) based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, use of 88,000 gallons per day (gpd) of water and generation of 77,000 gpd of wastewater. The project's re-development of an existing disturbed site and its location in close proximity to transit will serve to minimize overall impacts. The ENF indicates that measures to avoid, minimize and mitigate environmental impacts will include the incorporation of sustainable design elements in the building, provision of public open space (including an interpretive display regarding the history of the Middlesex Canal), development of a Transportation Demand Management (TDM) program to minimize traffic trips, assistance in implementing the City of Boston Crossroads Initiative and support for a comprehensive traffic study of the Bulfinch Triangle neighborhood.

Waiver Request

As noted above, this project exceeds a threshold for filing a mandatory EIR. The proponent has submitted an EENF with a request that I grant a Waiver of the requirement to prepare an EIR. The EENF has been subject to an extended comment period consistent with Section 11.05 (7) of the MEPA regulations. The MEPA regulations at 301 CMR 11.11(1) state that I may waive any provision or requirement in 301 CMR 11.00 not specifically required by MEPA and may impose appropriate and relevant conditions or restrictions, provided that I find that strict compliance with the provision or requirement would:

(a) result in an undue hardship for the Proponent, unless based on delay in compliance by the Proponent; and
(b) not serve to avoid or minimize Damage to the Environment.

In the case of a waiver of a mandatory EIR review threshold, the MEPA regulations at 301 CMR 11.11(3) state that, I shall at a minimum base the finding required in accordance with 301 CMR 11.11(1)(b) stated above on a determination that:

(a) the project is likely to cause no Damage to the Environment; and
(b) ample and unconstrained infrastructure facilities and services exist to support the project, when subject matter jurisdiction is broad in scope, or those aspects of the project within subject matter jurisdiction, when jurisdiction is limited to the subject matter of state agency permits.

Single EIR Request

The EENF included a request that I allow the proponent to fulfill its EIR obligations under MEPA with a Single EIR, rather than the usual process of a Draft and Final EIR in the event the waiver is not granted. As noted above, an EENF was submitted in conjunction with these requests and received an extended comment period pursuant to Section 11.05 (7) of the MEPA regulations. Section 11.06(8) of the MEPA regulations indicate that a Single EIR may be allowed provided that the EENF:

> (a) describes and analyzes all aspects of the Project and all feasible alternatives, regardless of any jurisdictional or other limitation that may apply to the Scope;
>
> (b) provides a detailed baseline in relation to which potential environmental impacts and mitigation measures can be assessed; and
>
> (c) demonstrates that the planning and design for the Project use all feasible means to avoid potential environmental impacts.

Review of the EENF

The EENF and supplemental materials provided by the proponent (in a letter dated May 2, 2008) provide project plans, a detailed project description, describe baseline environmental conditions (including a traffic analysis and air quality study), identify the potential environmental impacts of the project and potential measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts. The EENF includes information regarding the project's consistency with municipal and regional land use plans, with the Commonwealth's Sustainable Development Principles and with efforts to minimize greenhouse gases associated with the project design and long-term operation.

The EENF and comments from Bulfinch Triangle Community Advisory Committee (BTCAC) and the Downtown North Association (DNA) identify the extensive amount of land use, urban design and transportation studies conducted within the Bulfinch Triangle over the past decade. The North Area Planning Initiative and the Bulfinch Triangle Design and Development Guidelines emerged from these studies and articulate a comprehensive vision for urban design and development. These comments indicate that the project has involved substantive and continuing community participation, through the BTCAC. Several comment letters identify the community benefits associated with the inclusion of a grocery store, the siting of which has been an established goal of the City of Boston and the community.

Pursuant to *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168), the EENF submitted on this project addresses the project's impacts on the public's right to access, use and enjoy tidelands that are protected by chapter 91, and addresses the project's impacts on groundwater levels. The EENF also addresses aspects of the project that are subject to the required Public Benefit Review. It notes that the project consists of redevelopment of an existing vacant parcel in an area of the City targeted for growth and revitalization. It identifies site improvements including the creation of a small open space, a reduction in impervious surfaces and provision of pedestrian access around the site including

wide sidewalks, lighting and street furniture. The project design is intended to improve access to Causeway Street and the waterfront by providing a welcoming streetscape at the entryway to the Bulfinch Triangle fostered by wide, tree-planted sidewalks with ground level retail space attracting passerby attention and activity. In addition, it will enhance the pedestrian environment by creating continuous streetwalls along Valenti Way, Beverly Street, North Washington and New Chardon Street. The open space is programmed to educate the public about the rich history of the Middlesex Canal. It will be landscaped and include murals and interpretive displays. Pursuant to Article 32, Section 6 of the Boston Zoning Code, the proponent will certify that the project will not negatively impact groundwater levels on the site or on adjacent lots. Also, it indicates that the proponent may provide limited recharge prior to discharge to the Canal Street stormwater system. The Groundwater Trust did not provide any comments or otherwise identify concerns with the project's impact on groundwater.

As the EENF indicates, the MHC, as State Historic Preservation Officer (SHPO), in consultation with the Boston Landmarks Commission (BLC), must review and approve the design of development parcels in compliance with the Central Artery Memorandum of Agreement (MOA), pursuant to Section 106 of the National Historic Preservation Act (36 CFR 800). As required by the MOA, Joint Development Guidelines were developed by MassHighway (formerly the Massachusetts Department of Public Works), MHC and BLC that address height limits, design issues, massing, materials, siting and setback requirements. The purpose of the MOA and the Joint Development Guidelines were to insure that direct impacts to historic resources and potential environmental impacts associated with the development of parcels created by the CA/T Project (EEA #4325/8721) would be avoided, minimized and mitigated consistent with federal and state requirements. Under the terms of the Section 106 MOA, the MHC, in consultation with the BLC, must review and approve the new design of any new construction on any of the air rights parcels to ensure they are consistent with the established guidelines.

Comments from MHC indicate that the project exceeds the height limits identified in the Joint Development Guidelines, indicate that the project will have an adverse effect on the Bulfinch Triangle and Causeway/North Washington Street historic districts through the introduction of visual elements that are out of character with and alter the setting of these historic districts and request that an EIR be required to further explore how the project's impacts can be minimized. These comments also note that the proposed height of 146 feet exceeds the design guidelines which establish a minimum height of 60 and a maximum height of 100 feet. Comments from the City of Boston, which include comments from BLC, identify similar concerns with the proposed height and massing and, in particular, the project's impact on Canal Street and Valenti Way. In addition, MHC comments indicate that the MBTA failed to consult with MHC earlier in the disposition process as required by MG.L. Chapter 9, Section 26-27C.

As noted previously, the project will generate approximately 9,342 adt based on the ITE Trip Generation Manual. When this estimate is adjusted to reflect BTD mode shares, traffic generation is estimated at 2,942 adt. As noted previously, the EENF includes a traffic study and identifies, in general, measures to minimize impacts associated with this traffic. The EENF did not identify funding levels associated with various mitigation measures; however, the supplemental information indicates that the proponent anticipates providing $75,000 for neighborhood improvements, $12,000 for streetscape improvements, $50,000 for the Bulfinch

Triangle Traffic Study and approximately $1 per square foot of office and retail space for the Crossroads Initiative.

The project will generate either 33,000 gpd of wastewater (based on office use) or 77,000 gpd (based on R&D use) depending on the final uses identified for the building. Comments from the Massachusetts Water Resources Authority (MWRA), MassDEP and the Boston Water and Sewer Commission (BWSC) indicate that the proponent should assess the impact of this project on the Bulfinch Triangle Sewer Separation project and indicate that the proponent should participate in efforts to remove extraneous clean water (Infiltration/Inflow (I/I)) from the sewer system on a 4:1 basis for a maximum of 308,000 gpd.

This project is not subject to the EEA Greenhouse Gas Emissions Policy and Protocol.[2] However, to support its request for a Waiver or a Single EIR, the proponent has identified measures to avoid, minimize and mitigate greenhouse gas emissions associated with the building design and its long-term operation. The project will comply with Article 37 of the Boston Zoning Code and the proponent will seek certification under the Leadership in Energy and Environmental Design (LEED) Core and Shell Rating System. The EENF indicates that the proponent may seek certification at the Gold level. In addition, the proponent has committed to encourage project tenants to build space to LEED standards. Sustainable design elements include the redevelopment of an existing site in close proximity to transit, a relatively small parking supply, a TDM program including transit subsidies and bike storage, incorporation of a vegetated roof and use of low emitting materials including adhesives, sealants, paints and carpet systems. The proponent may purchase electricity from renewable energy sources.

Conclusion

Comment letters reflect strong support for the project and identify the need for a grocery store at this site. The proponent appears committed to minimizing its environmental impacts and, in particular, I applaud the proponent's intention to seek LEED Certification at the Gold level. The EENF meets the standard for granting a Single EIR because it provides adequate description and analysis of the project and its alternatives, provides a detailed baseline of environmental conditions and demonstrates that the project will incorporate all feasible means to avoid potential environmental impacts. The proponent may file a Single EIR to meet its MEPA review requirements. Concerns identified in comment letters are relatively narrow in scope. The granting of a Single EIR with a narrowly tailored Scope will significantly shorten the associated review period compared to a typical project and I expect that the issues identified in the Scope can be addressed within a relatively short timeframe.

The EENF does not meet the higher standards reflected in the criteria for granting a full Waiver of the EIR requirement including a demonstration that the requirement to prepare an EIR

[2] Projects are subject to the Policy if an EIR is required and the project falls into one of four categories, the first and second of which being that the Commonwealth or a state agency is either the proponent or is providing financial assistance. EEA's intent is to require analysis of greenhouse gas emissions in those instances where MEPA has full scope jurisdiction (or, as here, the functional equivalent of full scope jurisdiction). EEA will publish a clarification of the applicability of the Policy in a forthcoming Environmental Monitor. This project is not subject to the Policy.

would constitute a hardship to the proponent, a demonstration that the requirement to prepare the EIR will not serve to avoid or minimize Damage to the Environment or that the project will cause no Damage to the Environment. Comments from MHC and BLC clearly identify concerns with impacts to historic resources, consistency with the Joint Development Guidelines and identify additional information necessary to support its review. Addressing these concerns will require consultation with MHC and the BLC. The preparation of a Single EIR will provide additional information on historic resources and support the development of design refinements or development of mitigation measures that adequately avoid, minimize and mitigate impacts to historic resources. I do not expect final design approval as a condition of the Single EIR but do expect that substantive issues will be resolved. In addition, commenters have identified significant concerns with pedestrian access and safety and identify operational and design changes (by the proponent and others) that would improve access and minimize conflicts.

SCOPE

The EIR should follow the general guidance for outline and content contained in section 11.07 of the MEPA regulations, as modified by this Certificate.

Project Description

The EIR should include a thorough description of the entire project and all project elements and construction phases. The EIR should include an existing conditions plan illustrating resources and abutting land uses for the entire project area and a proposed conditions plan (or plans) illustrating proposed elevations, structures, access roads, stormwater management systems, and sewage connections associated with each phase of the project.

Project Permitting and Consistency

The EIR should briefly describe each state permit required or potentially required for the project and it should demonstrate that the project meets applicable performance standards.

Historic and Cultural Resources

The EIR should identify an alternative to the proposed height and massing that minimizes impacts to historic resources and addresses concerns expressed by MHC and BLC. The EIR should include 3-dimensional renderings and/or massing models that depict project alternatives in relation to the surrounding historic district. In addition, MHC has requested more detailed elevation drawings that illustrate proposed materials and sketches or more detailed descriptions of the proposed fenestration reveals as well as depths/dimensions of other applied or structural exterior details.

I note that previous projects reviewed by MEPA including Avenir (formerly Canal Place) (EEA #13674) and the Simpson Parcel (EEA#14153) enjoyed flexibility in the application of

design guidelines that were supported by MHC and BLC because of site constraints and the designs of the buildings to minimize impacts. I note that the maximum height of the Avenir project, which is located directly on Canal Street, was identified as 120 feet. The maximum height of the Simpson Parcel project, which is further setback from the Bulfinch Triangle Historic District, was 140 feet.

Transportation

The Single EIR should clearly identify and specify commitments to minimize the traffic impacts of the project including a proposed TDM Program. The EENF indicated that the TDM Program may include limited parking, designation of a transportation coordinator to manage service and loading and provide alternative transportation materials to office and retail tenants, provision of orientation packets to residents regarding transit options, and provision of bicycle racks. Also, the project may include a partnership with a car sharing service.

Comments from DNA and Walk Boston identify significant issues regarding vehicular and pedestrian access and safety and identify opportunities for addressing these issues. A particular area of concern are the constraints associated with Valenti Way particularly in light of the many demands that will be placed on it to provide vehicular access, loading access and support large volumes of pedestrians accessing the adjacent MBTA Green/Orange Superstation entrance and other destinations. The Single EIR should address whether and how primary access could be provided via North Washington Street to minimize truck traffic along Valenti Way, identify associated constraints (physical or regulatory) and identify how this issue may be addressed through subsequent permitting and review processes. The EIR should identify other measures that could be incorporated into the project and/or street design to minimize conflicts and improve safety along Valenti Way. It should identify how proposals to change streets from one-way to two-way or vice versa will be evaluated and assess qualitatively the benefits of these proposals to the project and traffic flow. Finally, it should address the suggestion by Walk Boston that the effective width of the sidewalk along North Washington Street be re-evaluated.

Wastewater

The Single EIR should identify the proponent's commitment to remove I/I from the system of a 4:1 basis. As noted previously, comments from the MWRA indicate that if industrial or R&D uses are included that will discharge industrial or laboratory wastewater to the sanitary sewer system, an MWRA Sewer Use Discharge Permit will be required. The Single EIR should describe the type of R&D uses that may be appropriate for the site and indicate whether a permit from the MWRA would be required. If such a permit is likely to be required, the Single EIR should address consistency with permit requirements.

Landlocked Tidelands

The project is proposed on landlocked tidelands and subject to the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168). Consistent

with Section 8 of this legislation, I must conduct a Public Benefits Review as part of the EIR review of projects located on landlocked tidelands that entail new use or modification of an existing use and I must make a Public Benefits Determination following completion of my review. Because the proponent has requested a Single EIR, I will issue the Public Benefits Determination after completing my review of the Single EIR.[3]

Section 3 of this legislation requires that any project that is subject to MEPA review and proposes a new use or structure or modification of an existing use or structure within landlocked tidelands address the project's impacts on tidelands and groundwater within the ENF. It indicates that the ENF *"shall include an explanation of the project's impact on the public's right to access, use and enjoy tidelands that are protected by chapter 91, and identify measures to avoid, minimize or mitigate any adverse impacts on such rights set forth herein."* If a project is located in an area where low groundwater levels have been identified by a municipality or by a state or federal agency as a threat to building foundations, the ENF *"shall also include an explanation of the project's impacts on groundwater levels, and identification and commitment to taking measures to avoid, minimize, or mitigate any adverse impacts on groundwater levels."* The legislation notes that these provisions also apply to the filing of an EIR if an EIR is required.

The resolution of historic issues, transportation issues and the clarification of mitigation commitments in the Single EIR will be required to issue a positive Public Benefits Determination.

Mitigation

The EIR should include a separate chapter on mitigation measures. It should include a Draft Section 61 Finding for all state permits that includes a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation, and the identification of the parties responsible for implementing the mitigation. A schedule for the implementation of mitigation, based on the construction phases of the project, should also be included.

This section should indicate whether the proponent will participate in the MassDEP Diesel Retrofit Program and consider use of on-road ultra low sulfur diesel (ULSD) fuel to minimize construction period air quality impacts as suggested by MassDEP and the City of Boston Environment Department.

Response to Comments

The EIR should contain a copy of this Certificate and a copy of each comment received. To ensure that the issues raised by commenters are addressed, the Single EIR should include a response to comments. This directive is not intended to, and shall not be construed to, enlarge the scope of the Single EIR beyond what has been expressly identified in this Certificate. I

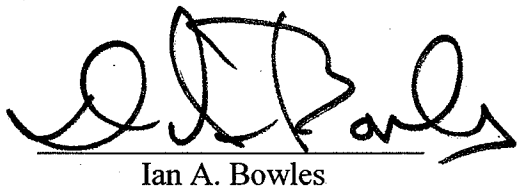
[3] I have convened a Technical Advisory Committee (TAC) to assist me in developing a formalized process by which to implement those aspects of the statute that direct the involvement of EEA and the MEPA Office. In the interim, the approach to the Public Benefits Determination reflected in this document should be considered provisional.

recommend that the proponent use either an indexed response to comments format, or a direct narrative response.

Circulation

The EIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should be sent to any state agencies from which the proponent will seek permits or approvals, to the list of "comments received" below and to City of Boston officials. A copy of the EIR should be made available for review at the Boston Public Library.

May 9, 2008
Date



Ian A. Bowles

Comments received:

4/28/08	Department of Environmental Protection/Northeast Regional Office (MassDEP/ NERO)
4/25/08	Massachusetts Historical Commission (MHC)
4/10/08	Massachusetts Water Resources Authority (MWRA)
4/10/08	US Department of Transportation/Federal Highway Administration (DOT/FHWA)
4/30/08	City of Boston Environment Department
4/28/08	Boston Water and Sewer Commission
4/28/08	Bulfinch Triangle Community Advisory Committee
4/28/08	Charles River Watershed Association
4/28/08	Downtown North Association
4/25/08	Walk Boston
4/27/08	Jane Forrestall

IAB/CDB/cdb

ENVIRONMENTAL NOTIFICATION FORM

Commonwealth of Massachusetts
Executive Office of Environmental Affairs ■ MEPA Office

ENF Environmental Notification Form

For Office Use Only *Executive Office of Environmental Affairs*
EOEA No.: 14194
MEPA Analyst: Deirdre Buckley
Phone: 617-626- 1044

The information requested on this form must be completed to begin MEPA Review in accordance with the provisions of the Massachusetts Environmental Policy Act, 301 CMR 11.00.

Project Name: Bulfinch Triangle Project		
Street: MTA Parcels 2A & 2C, MBTA Parcel 2B (Valenti Way/New Chardon Street/Beverly Street)		
Municipality: Boston	Watershed: Boston Harbor	
Universal Tranverse Mercator Coordinates: UTM (Zone 19) 330447, 4692272	Latitude: 42° 21′ 51.3″ N Longitude: 71°3′ 32.6″ W	
Estimated commencement date: Fall 2008	Estimated completion date: Fall 2010	
Approximate cost: $200 million	Status of project design: 15 %complete	
Proponent: Hines Raymond LLC c/o Hines		
Street: 222 Berkeley Street, Suite 1420		
Municipality: Boston	State: MA	Zip Code: 02116
Name of Contact Person From Whom Copies of this ENF May Be Obtained: Corinne Snowdon		
Firm/Agency: Epsilon Associates, Inc.	Street: 3 Clock Tower Place, Suite 250	
Municipality: Maynard	State: MA	Zip Code: 01754
Phone: (978) 897-7100	Fax: (978) 897-0099	E-mail: csnowdon@epsilonassociates.com

Does this project meet or exceed a mandatory EIR threshold (see 301 CMR 11.03)?
☒Yes ☐No

Has this project been filed with MEPA before?
☐Yes (EOEA No._____) ☒No

Has any project on this site been filed with MEPA before?
☐Yes (EOEA No._____) ☒No

Is this an Expanded ENF (see 301 CMR 11.05(7)) requesting:

a Single EIR? (see 301 CMR 11.06(8))	☒Yes	☐No
a Special Review Procedure? (see 301CMR 11.09)	☐Yes	☒No
a Waiver of mandatory EIR? (see 301 CMR 11.11)	☒Yes (See waiver request)	☐No
a Phase I Waiver? (see 301 CMR 11.11)	☐Yes	☒No

Identify any financial assistance or land transfer from an agency of the Commonwealth, including the agency name and the amount of funding or land area (in acres):
Parcel 2A and Parcel 2C will be the subject of a 99-year ground lease from the Massachusetts Turnpike Authority (MTA). Parcel 2B will be leased under a 99-year lease of land and air rights from the Massachusetts Bay Transportation Authority (MBTA).

Are you requesting coordinated review with any other federal, state, regional, or local agency?
☐Yes(Specify_____) ☒No (The project is undergoing review by the Boston Redevelopment Authority (BRA) under Article 80 of the Boston Zoning Code.)

List Local or Federal Permits and Approvals: FEDERAL: US EPA – NPDES Permit; Federal Highway Administration – Section 106 review, Surplus approval, Approval of non-highway use of ROW; SHPO – Section 106 Review; FAA – Notice of Construction. LOCAL: Boston Redevelopment Authority – Article 80 Review; Boston Civic Design Commission – Design Approval, Boston Transportation Department – Transportation Access Plan Agreement and Construction Management Plan, Boston Zoning Board of Appeal – Zoning Relief; Boston Air Pollution Control Commission – APCC review; Boston Committee on Licenses – Permit to operate Parking Garage and Fuel Storage License (Auto and Emergency Generator), Boston Public Improvement Commission – Sidewalk and Street Related Permitting, Boston Water and Sewer Commission – Site Plan Approval and Utility Connection Permits, Boston Public Works Department – Curb Cut Permits (minor/driveways) and Street Occupancy Permits (construction), and Boston Inspectional Services Department – Building Permit.

Which ENF or EIR review threshold(s) does the project meet or exceed (see 301 CMR 11.03):

- ☐ Land
- ☐ Water
- ☐ Energy
- ☐ ACEC
- ☐ Rare Species
- ☐ Wastewater
- ☐ Air
- ☐ Regulations
- ☐ Wetlands, Waterways, & Tidelands
- ☒ Transportation
- ☐ Solid & Hazardous Waste
- ☐ Historical & Archaeological Resources

Summary of Project Size & Environmental Impacts	Existing	Change	Total
LAND			
Total site acreage	1.46		
New acres of land altered		0	
Acres of impervious area	1.46	-0.14	1.32
Square feet of new bordering vegetated wetlands alteration		0	
Square feet of new other wetland alteration		0	
Acres of new non-water dependent use of tidelands or waterways		0	
STRUCTURES			
Gross square footage	0*	488,000	488,000
Number of housing units	0	0	0
Maximum height (in feet)	58	88	146**
TRANSPORTATION			
Vehicle trips per day Unadjusted: Adjusted:	 0 0	 9,342 2,942	 9,342 2,942
Parking spaces	0	200	200

State Permits & Approvals

- ☐ Order of Conditions
- ☐ Superseding Order of Conditions
- ☐ Chapter 91 License
- ☐ 401 Water Quality Certification
- ☐ MHD or MDC Access Permit
- ☐ Water Management Act Permit
- ☐ New Source Approval
- ☒ DEP or MWRA Sewer Connection/ Extension Permit
- ☐ Other Permits (*including Legislative Approvals*) – Specify:

EOTC: Approvals Under MGL Ch40 Section 54a
MHC: Chapter 254 review
MWRA: Industrial Discharge Permit (for R&D use)
MTA: Execution of Lease
MBTA: Execution of Lease/Chapter 254 review

* Both existing and total GSF do not include the MBTA Transformer Vault and the MBTA Vent Buildings.
** Height as measured by the Boston Zoning Code.

WATER/WASTEWATER***			
Gallons/day (GPD) of water use	0	37,000	37,000
GPD water withdrawal	0	0	0
GPD wastewater generation/ treatment	0	33,000	33,000
Length of water/sewer mains (in feet)	370 (water main)	90 (water main)	460 (water main)

*** In the event the office component of the project is replaced by research and development space, the project will generate 88,000 gpd of water and generate 77,000 gpd of wastewater and require a sewer connection permit.

CONSERVATION LAND: Will the project involve the conversion of public parkland or other Article 97 public natural resources to any purpose not in accordance with Article 97?

☐Yes (Specify_____) ☒No

Will it involve the release of any conservation restriction, preservation restriction, agricultural preservation restriction, or watershed preservation restriction?

☐Yes (Specify_____) ☒No

RARE SPECIES: Does the project site include Estimated Habitat of Rare Species, Vernal Pools, Priority Sites of Rare Species, or Exemplary Natural Communities?

☐Yes (Specify_____) ☒No

HISTORICAL /ARCHAEOLOGICAL RESOURCES: Does the project site include any structure, site or district listed in the State Register of Historic Place or the inventory of Historic and Archaeological Assets of the Commonwealth?

☐Yes (Specify_____) ☒No

If yes, does the project involve any demolition or destruction of any listed or inventoried historic or archaeological resources?

☐Yes (Specify_____) ☒No

AREAS OF CRITICAL ENVIRONMENTAL CONCERN: Is the project in or adjacent to an Area of Critical Environmental Concern?

☐Yes (Specify_____) ☒No

PROJECT DESCRIPTION: The project description should include **(a)** a description of the project site, **(b)** a description of both on-site and off-site alternatives and the impacts associated with each alternative, and **(c)** potential on-site and off-site mitigation measures for each alternative (*You may attach one additional page, if necessary.*)

PROPOSED PROJECT

The Bulfinch Triangle Project (the "project") proposed by Hines Raymond LLC (the "proponent") involves the development of surface and air rights on Parcels 2A, 2B and 2C (see Project Locus in Attachment 1). The proposed project's location in the Bulfinch Triangle presents an opportunity for a design that will create an active edge and gateway to the Bulfinch Triangle district, yet respects the historic tradition of the architecture and massing of the existing buildings within the Bulfinch Triangle.

The Bulfinch Triangle Project is a vibrant, mixed-use development totaling approximately 488,000 gross square feet (gsf) with approximately 295,000 sf of commercial office or research and development (R&D) space[1], a much-

[1] At this time, the proponent is contemplating the development of 295,000 gsf of either commercial office or research and development space. The analyses in this ENF evaluate the maximum potential impact of either commercial office or research and development. The massing of the project is the same for either proposed use.

needed neighborhood supermarket, as well as retail uses on the ground floor. Two levels of above grade parking with approximately 200 parking spaces will be included in the project. The project also incorporates approximately 18,000 sf of loading areas, vehicle access and an area for emergency vehicles. To celebrate the site's location as the Boston terminus of the Middlesex Canal, an open space area is proposed on Parcel 2C.

The removal of the elevated Central Artery and Green Line structures has transformed the shadowed streets of the project area and allows for the creation of new pedestrian scale streets and buildings that complement the residential North End, the larger scale government and entertainment uses of the Federal Building and TD BankNorth Garden, the historic mixed uses of the Bulfinch Triangle and the high rise residential uses of the West End. The redevelopment of the Bulfinch Triangle Project site will reinforce the ongoing revitalization of the area by infusing the area with street level retail uses and introducing new office workers to the district.

The project emphasizes smart growth by incorporating sustainable design principles into the siting, planning, construction and operation of the project. The project represents a Transit Oriented Development through the creation of a mixed-use development adjacent to a variety of transit choices. The project is located near North Station, with access to the Green Line and Orange Line rapid transit stations immediately across Valenti Way, and the MBTA Commuter Rail and Amtrak a block away. Further, MBTA bus service is located across New Chardon Street at Haymarket Station. This strategic location will ensure that many of the approximately 1,700 workers in the project will have the ability to get to work using at least one mode of public transportation. Consistent with the Massachusetts Office of Commonwealth Development, the project concentrates development, integrates uses and will foster a sense of place.

PROJECT SITE

The project site comprises the development of surface and air rights on Parcels 2A, 2B and 2C. These parcels are among the development sites in the Bulfinch Triangle created by construction of the Central Artery/Tunnel (CA/T) Project and submersion of the Massachusetts Bay Transportation Authority (MBTA) Green Line. Hines Raymond LLC has been designated by the MBTA for Parcel 2B and by the Massachusetts Turnpike Authority (MTA) for Parcels 2A and 2C. The project site is generally bounded by Canal Street, the existing Terra Cotta Building, Valenti Way, Beverly Street, North Washington Street and New Chardon Street. The project site incorporates Parcels 2A and 2C to be ground leased from the MTA, and Parcel 2B to be ground leased from the MBTA. These three parcels total approximately 1.46 acres. Portions of the project site were formerly obscured by the Central Artery and elevated Green Line. Although most of the site is vacant due to the CA/T Project and the undergrounding of the Green Line, the project site includes an MBTA Transformer Vault and MBTA Vent Building (See Attachment 1 – Existing Conditions Site Plan).

ALTERNATIVES

For over a decade, the Downtown North area, and the Bulfinch Triangle neighborhood in particular, have been the subjects of a number of significant studies. Driven by the opportunities resulting from the Central Artery/Tunnel (CA/T) project, these studies have resulted in a substantial amount of knowledge regarding the area, its history and its character. Additionally, these studies have resulted in an overall planning framework for informing and guiding the area's future urban design and development. Documents such as the North Area Planning Initiative and the Bulfinch Triangle Design and Development Guidelines have articulated a comprehensive vision to shape the area's future urban environment.

The project respects the urban design principles in the Bulfinch Triangle Design and Development Guidelines. These guidelines were created from hundreds of hours of work by the City and the community, and honor not only the history of the neighborhood but also its future.

During the development of project design, the massing, proposed uses and design have evolved. Initial designs did not incorporate a supermarket into the project. In response to input from the community and the Boston Redevelopment Authority (BRA), the project was subsequently redesigned to include this significant component. The initial program for the project included residential condominium units. The downturn in the condominium market has made that program infeasible. Given the stronger fundamentals of the commercial sector, the proponent has opted to move forward with an office/R&D use in the upper floors of the project. During initial design explorations, the proponent evaluated options to incorporate the Terra Cotta Building located on an adjacent parcel into the project. The three-story Terra Cotta Building fronts on Canal Street and is currently occupied by

approximately 25,500 sf of retail, restaurant and office uses. Given the use change of the project, the Canal Street entry is no longer imperative and as such the Terra Cotta Building is no longer part of the project. The building massing has been modulated to relate to and reinforce the characteristics of both the existing Canal Street buildings near the project site and the proposed massing of the other Bulfinch Triangle parcels slated for development.

MITIGATION

The project will continue the ongoing redevelopment of the Bulfinch Triangle. The project site will be transformed from an underutilized parcel into a modern mixed-use development with active ground floor uses. The proposed project provides numerous public benefits including the following:

- Help establish a vibrant mixed-use community by providing a range of uses that will contribute to a vital urban realm throughout the course of the day;
- Provide a much-needed supermarket for residents of the West End, North End and other surrounding neighborhoods;
- Respect the historic integrity of the Bulfinch Triangle through a project design that will integrate the historic character of the area with the 21st Century development of the Central Artery parcels;
- Educate the public through the creation of an interpretive display at Parcel 2C commemorating the rich history of the Middlesex Canal which formerly ran near the location of Canal Street and extended to the Merrimack River;
- Establish a continuous street wall along Valenti Way, North Washington, New Chardon and Beverly Streets;
- Provide linkage payments to the City of Boston through both a housing contribution grant and a jobs contribution grant to the Neighborhood Housing Trust and the Neighborhood Jobs Trust;
- Incorporate a number of sustainable/green design features into the project to preserve and protect the local environment (Please see Attachment 4 for a detailed discussion of the project's smart growth and sustainable design initiatives);
- Contribute to a comprehensive traffic study of the Bulfinch Triangle neighborhood that will serve to improve the traffic in the area and mitigate future traffic difficulties;
- Assist in the implementation of the Boston Crossroads Initiative, a planning effort to redesign and revitalize the roads that cross the Rose Fitzgerald Kennedy Greenway and connect people to neighborhoods and destinations on either side;
- Generate approximately 200 permanent jobs in the supermarket/ retail component of the project, provide space for approximately 1,500 permanent jobs to be provided by companies to occupy the office component, and approximately 450 daily construction jobs over the 24 month construction period;
- Promote local employment through good-faith efforts to hire Boston residents for construction jobs; and
- Provide $2.5 million in annual property tax revenues, at full build-out and occupancy, to the City of Boston.

Applicability of MEPA's Greenhouse Gas Emissions Policy

MEPA's Greenhouse Gas Emissions Policy applies to projects being undertaken by the Commonwealth or a state agency or for which the Commonwealth or a state agency is providing financial assistance, and to projects that are privately funded and require either an Air Quality Permit from the Department of Environmental Protection or a Vehicular Access Permit from the Massachusetts Highway Department. The Proponent of the Bulfinch Triangle Project is not the Commonwealth or state agency. The Project does not include financial assistance from the Commonwealth or state agency, does not require an Air Quality Permit from DEP and does not require a Vehicular Access Permit from MHD. As such, the Project is not subject to MEPA's Greenhouse Gas Emissions Policy.

Parcel 2A and Parcel 2C will be the subject of a 99-year ground lease from the Massachusetts Turnpike Authority (MTA). Parcel 2B will be leased under a 99-year lease of land and air rights from the Massachusetts Bay Transportation Authority (MBTA). The Proponent understands that the MEPA Office is planning to revise the Policy so that it would apply to a project that is within the area of a land transfer, but that revision has not yet been made.

Although the GHG Policy does not apply to the Project, the Proponent requests that, should the proposed revisions to the Policy become effective during the MEPA review of the Project, the preparation of a quantification analysis of greenhouse gas emissions not be required pursuant to the "Opt Out Provision" of the GHG policy. The Proponent is committed to exceptional measures that will reduce GHG emissions. Some of the Project's sustainable design elements include provision of a vegetated roof, the use of low emitting materials, including adhesives and sealants, paints, and carpet systems, and potentially the purchase of electrical power from a "GREEN" provider who produces energy through renewable energy sources. Additional sustainable design elements and are described in Attachment 4. The proponent is committed to the U.S. Green Building Council's LEED program and is exploring the potential for the project to be LEED certified at the Gold Level. The most relevant LEED rating system would be the LEED Green Building Rating System for Core and Shell Development (LEED-CS). The core and shell system is suitable for projects where the owner does not have control over interior design and fit-out. The current checklist for LEED-CS is Version 2.0 and is included in Attachment 4. The checklist indicates that the project includes at least 28 credits and is investigating the most prudent methodology for achieving at least 6 additional credits to achieve a Gold rating. At this juncture, there are 19 credits still being reviewed. Please see Attachment 4 for more details on sustainable design.

Expanded ENF

Attachment 4 Sustainable Design

4.0 SUSTAINABLE DESIGN

4.1 Introduction

The proponent is committed to the efficient use of renewable resources to reduce the impact of built projects on its surroundings, while also creating a pleasant and healthy working environment.

Hines began implementing efficient technologies virtually since it was founded in 1957 by Gerald Hines, a mechanical engineer by training, and has been perfecting them since. The recent industry trend towards sustainability has coincided with the firm's longstanding belief in high performance technologies and the long-term value they present to owners and tenants alike.

Hines executives have been actively involved in the development of the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) programs since their inception; in fact, one of the LEED programs is chaired by a Hines executive.

Six Hines buildings are LEED certified (3 Gold, 2 Silver, 1 Certified), twelve projects under construction or in development are pre-certified (including South Station which is LEED Silver), and another 37 are registered, including the Bulfinch Triangle Project. A summary of Hines' LEED's-registered buildings are included in Table 4-1.

It is anticipated that all of the core and shell office space in the project will be LEED certifiable, and Hines will encourage tenants to also build out their space to be LEED certifiable.

In 2004, Hines became the only real estate company to receive the Environmental Protection Agency's ENERGY STAR Sustained Excellence Award. Prior to that, Hines was named ENERGY STAR Partner of the Year three years running, from 2001-2003. Here in Massachusetts, the first commercial office building to earn the Energy Star building label was 222 Berkeley in Back Bay which was developed by, and is managed by, Hines.

In short, Hines has a long term commitment to lasting quality and value, operational efficiency, environmental sensitivity, and resource conservation.

So strong is the Hines belief in addressing environmental concerns and the desire to make it part of their corporate fabric that a number of specific, organized responses to environmental needs have evolved within the company. These include a wide range of concerns, from the resource conserving design features and locations of Hines' buildings to the safe and proper handling of chemicals and wastes, protection of the indoor air environment and responsible management of ozone depleting compounds, asbestos and fuels. These environmentally conscientious responses can be characterized in three ways in the order that they occur in the development process;

- The siting of the development to promote ease of access to and use of public transportation where feasible.

- The design features and quality of construction included in Hines' buildings permitting the efficient use of resources and maximizing productivity.

- The operation of Hines properties in ways that utilize resources efficiently.

Hines has always sought to maximize and leverage the use of public transportation in the projects it has developed. Many Hines properties have been developed such that access to public transportation was incorporated as an integral part of the design. Many examples exist in Boston, New York, Washington DC and dozens of other major cities throughout the US and the world.

Table 4-1: Hines LEED Certified Buildings

Property	Location	LEED Level	SF
Certified			
1180 Peachtree	Atlanta, GA	Certified Gold	681,000
30 Hudson	Jersey City, NJ	Certified	1,319,778
One South Dearborn	Chicago, IL	Certified Silver	820,000
Owens Corning World	Toledo, OH	Certified Silver	370,816
Takeda Pharmaceuticals	Chicago, IL	Certified Gold	382,000
ABN AMRO	Chicago, IL	Certified Gold	1,180,000
Pre-Certified			
Tower 333	Bellevue, WA	Pre-certified Silver	410,000
La Jolla Commons	San Diego, CA	Pre-certified Silver	300,661
2211 Michelson	Irvine, CA	Pre-certified Silver	266,000
1515 Wynkoop	Denver, CO	Pre-certified Silver	266,000
One Victory Park	Dallas, TX	Pre-certified Silver	445,117
300 North LaSalle	Chicago, IL	Pre-certified Gold	1,500,000
South Station Tower	Boston, MA	Pre-certified Silver	1,000,000
1200 19th Street	Washington, D.C.	Pre-certified Silver	235,404
24th at Camelback, Phase II	Phoenix, AZ	Pre-certified Silver	307,000
Varesine	Milan, Italy	Pre-certified Silver	1,513,000
Porta Nuova	Milan, Italy	Pre-certified Silver	1,184,030
Tripark Business Centre	Madrid, Spain	Pre-certified	349,827

4.2 Transportation

The project represents a Transit Oriented Development through the creation of a mixed-use development adjacent to a variety of transit choices. The project is located near North Station, with access to the MBTA Commuter Rail and Amtrak a block away, Green Line and Orange Line rapid transit stations immediately across Valenti Way. Further, MBTA bus service is located across New Chardon Street at Haymarket Station. This strategic location will ensure that many of the over 1,700 workers in the project will have the ability to get to work using at least one mode of public transportation.

The incentives to use alternate means of transportation generated by an easily accessible building site will be complemented and strengthened by the proponent's implementation of an aggressive travel demand management program (TDM) and an on-site transportation coordinator. The TDM program is discussed in detail in Attachment 2 of this document.

4.3 Smart Growth/Sustainable Development

The Massachusetts Office for Commonwealth Development lists a variety of sustainable development principles aimed at promoting Smart Growth in the Commonwealth. Smart Growth is intended to draw attention and resources to restoring community vitality to city centers and older suburbs. Smart growth and sustainable development principles that are embodied as part of the planning of the project include:

- Concentrating development that is compact, integrates uses, and fosters a sense of place;
- Providing transportation choices;
- Increasing job opportunities near transportation options; and
- Planning regionally through the development of a project with regional benefits.

4.4 Proponent's Approach to Sustainable Design

To help make sure that all viable, resource-conserving options have been properly considered for inclusion into the project design, Hines ensures that "Green Design" features are incorporated into every Hines project as warranted by the unique market and climatic conditions applicable to each project. The features which Hines typically incorporates into all of its major projects will contribute toward what is anticipated to be a LEED certification of Gold for the office components of the project. The features are summarized in Table 4-2. Hines and its design consultants will explore many other resource-conserving design features as design of the project advances.

Once a building becomes operational, Hines establishes procedures that support the day-to-day functions in an environmentally conscientious manner. Much of this part of the process

relies on Hines General Policy 40, a comprehensive environmental policy. Hines General Policy 40 provides guidance in the efficient management of resources. This policy, first issued in 1987 and continuously revised and updated since then, sets forth clearly defined objectives as well as establishing roles for the firm's properties in support of this policy. A summary of how the policy is applied to Hines' office buildings in Boston is shown in Table 4-3 for reference.

One of the major benefits of General Policy 40 was the creation of a series of in- depth Environmental Guidelines that help direct the managers and operators of Hines properties in establishing property specific environmental programs.

These programs ensure that Hines property managers and engineers become familiar with property specific environmental issues by causing them to take a concentrated look at Hines' properties from an environmental perspective. They provide processes for gathering pertinent data and creating procedures relevant to the successful prevention and resolution of any environmental condition or concern that may exist now or arise in the future.

As a result of these practices, Hines properties have:

- Some of the lowest rates of ozone depleting compound emissions in the US and
- Some of the lowest energy use figures in the US.

Many of the actions Hines takes to maintain quality environmental and safety standards are plainly evident to those who work in or visit Hines' properties which helps maintain the Hines reputation for quality. The company has been recognized for its efforts by the Environmental Protection Agency:

- Environmental Protection Agency's Energy Star partner of the year in 2001, 2002 and 2003.
- In 2004, Hines became the first real estate company to have been recognized by the Environmental Protection Agency's Energy Star Sustained Excellence Award "for the firm's outstanding and continued leadership in reducing Greenhouse gas emissions through superior energy management.
- Hines currently manages 11% of all Energy Star-labeled privately-owned commercial square footage in the U.S.
- One of the highest rates of recycling in the nation.

Table 4-2: Resource Conserving Features and Practices Employed in the Design and Construction of Hines Buildings

PROGRAM	DESCRIPTION	IMPACT
Design- MEP	Provide a centralized automated building management system.	Provides energy efficient operation. Reduces use of electricity, gas, and other fuels and production of greenhouse gases.
Design- MEP	Provide a high efficiency filtration system for air pollutants.	Reduces levels of contaminants in air and improves heat exchange performance.
Design- MEP	Provide for the ASHRAE Standard 62-2001 outside air requirement.	Provides increased levels of outside air to building occupants.
Design- MEP	Provide high efficiency variable speed pumps, motors and fans.	Provides energy efficient operation. Reduces use of electricity, gas and other fuels and production of greenhouse gases.
Design- MEP	Provide an energy efficient lighting system, i.e., electronic ballasts and controls on a floor-by-floor or area-by-area basis.	Provides energy efficient operation. Reduces use of electricity, gas and other fuels and production of greenhouse gases.
Design- MEP	Specify Heating Ventilation and Air Conditioning (HVAC) and refrigeration equipment that do not contain chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs) and a non-halon/CFC/HCFC fire suppression system.	Reduces emissions of ozone depleting compounds.
Design- MEP	Install a water efficient cooling tower system.	Reduces loss of water and chemicals required to treat it.
Design- MEP	Provide a water conservation program that complies with plumbing fixture requirements of the local code or LEED, whichever is most stringent.	Reduces water use.

PROGRAM	DESCRIPTION	IMPACT
Design- MEP	Provide an automated lighting control system for perimeter exterior lighting.	Provides energy efficient operation. Reduces use of electricity, gas and other fuels and production of greenhouse gases.
Design- MEP	Lead solder or lead-containing components are prohibited for use in potable/domestic water systems.	Eliminates lead from drinking water supplies.
Design- MEP	Provide a demand ventilation control system to measure quality of outside air delivered to each floor via the Building Management System to insure compliance with ASHRAE 62-2001.	Improves Indoor Air Quality (IAQ) and provides energy efficient operation. Reduces use of electricity, gas and other fuels and production of greenhouse gasses.
Design- MEP	Internal duct lining prohibited.	Eliminates fibrous materials from airstream.
Design- MEP	Install refrigerant alarms, refrigerant relief valves and refrigerant recovery system.	Includes alarms to indicate accidental release of refrigerant and relief control valves to stop accidental discharge of refrigerant.
Design- MEP	Installed "Zero Emission" purge systems.	Reduces refrigerant loss.
Design- MEP	Install IAQ type air handling units with stainless steel drain pans, coil casings and coil supports, properly pitched with cleanable surfaces.	Improves IAQ by reducing likelihood of microbiological contamination.
Design-MEP	Energy efficient harmonic mitigating transformers.	Reduces energy losses while canceling harmonic currents in tenant distribution.
Design- Architectural	Low E glass and window blinds for passive solar load reduction.	Reflects the sun's energy while reducing interior heat energy losses.

PROGRAM	DESCRIPTION	IMPACT
Design- Architectural	Provide a managed live planting material program in common spaces.	Improves IAQ and occupant experience.
Construction	Require an Indoor Air Quality Management Program. 1. The development and implementation of an IAQ management plan for the construction process, which is consistent with EPA and Sheet Metal and Air Conditioning Contractors National Association's (SMACNA) IAQ Guidelines for Occupied Buildings Under Construction. The management plan shall provide for: Protection of the ventilation system components (equipment and pathways) from contamination. *OR* After completion of construction and prior to occupancy provision of cleaning requirements for ventilation system components and pathways exposed contamination during construction. 2. Advanced Construction IAQ Management Plan. Undertaking the management plan requirements above and implementing the following additional measures: Reduction of construction contaminants in the building prior to occupancy (e.g. dust, particulates, water infiltration related contamination VOCs). *AND* If the return air side of a system is used during construction, provide a minimum of 85% filtration, as determined by ASHRAE Standard 5.1-1992, on return side system components during construction and replacement of all filtration media prior to	Provides improved IAQ during the construction process.

PROGRAM	DESCRIPTION	IMPACT
	occupancy.	
Construction	Require an extensive MEP and Fire Protection System Commissioning Program to insure efficient and proper operation of the newly installed building systems.	Ensures that all systems that are intended to control environmental impact are functioning as designed and as intended.
Construction	Issue tenant construction guidelines to assure "green" goals are maintained.	Enlists the building occupants uphold environmental initiatives that they can affect.
Construction	Provide a Tenant Sustainable Design Guideline.	Provides tenants with information regarding sustainable technologies incorporated into the building and guidelines to follow to help maintain and further their use.

Table 4-3: Resource Conserving Features and Practices Employed in the Operation of Hines Boston Office Buildings

PROGRAM	DESCRIPTION	IMPACT
Operations - Recycling	Recycle mixed paper, cardboard, newspapers aluminum cans.	50% recycling history is one of highest rates in Boston as recognized by Waste Cap. Reduce loss of natural resources and lessen impact to land fills.
Operations - Recycling	Chiller and generator oil recycling.	Recovered oil is reprocessed for re-use or burnt as fuel.
Operations - Recycling	Florescent lamps recycling.	All mercury, phosphors, aluminum and glass recovered.
Operations - Recycling	Battery recycling.	Lead is recycled and case is incinerated.
Operations - Recycling	Oil based paint recycling.	Cans recycled, paint mixed and burnt for fuel.
Operations - Energy Reduction	Chiller efficiency testing	Regular monthly testing insures efficient energy use.
Operations - Energy Reduction	Preventative maintenance	Regular maintenance for equipment insures efficient energy use and dependability.
Operations - Energy Reduction	Automated NStar demand management program with cooperation from major tenants.	On call, reduce consumption in buildings decreasing load on network during peak use periods. This reduces reliance on additional fossil fuel burning generating plants.

PROGRAM	DESCRIPTION	IMPACT
Operations - Energy Reduction	Energy management practices including, load shedding, daily demand monitoring, use of tower bypass, use of "free cooling" heat exchangers.	Frequent monitoring permits maintaining tighter control over how energy is used. Tower bypass reduces need to use additional energy to prevent tower freezing. Heat exchangers allow cooling of building without operation of electrically driven chillers.
Operations - Energy Reduction	Installed higher efficiency florescent lamps where possible as new technology develops.	Installation of energy efficient lighting significantly reduces energy consumption.
Operations - Energy Reduction	Energy efficient harmonic mitigating transformers.	Reduces energy losses while canceling harmonic currents in tenant distribution.
Operations - Energy Reduction	Currently enrolled in NStar's recommissioning Pilot program.	Evaluate all building HVAC and electrical systems for adherence to design spec. Up to 15% energy reduction.
Operations - Ozone Depletion Reduction	Obtain refrigerant conserving service equipment	Recovery system installed to reduce refrigerant emissions during servicing and to comply with requirements of EPA's Title VI Section 608.
Operations - Ozone Depletion Reduction	Maintain refrigerant use tracking program.	Helps track and reduce refrigerant usage.

PROGRAM	DESCRIPTION	IMPACT
Operations - Ozone Depletion Reduction	Implement refrigerant saving practices.	Responsible staff members are refrigerant certified, meeting requirements of EPA's Title VI Section 608.
Operations - Indoor Environment Operations - Quality Maintenance	Procedures in place for monitoring and response to potential IAQ incidents.	A comprehensive profile of the building has been produced. This promotes in depth awareness by the engineering staff of conditions that may affect IAQ and improves response in the event of an incident.
Operations - Indoor Environment Quality Maintenance	Improved access to air handling and duct systems.	Duct inspection access installed on all equipment to facilitate regular inspection and maintenance process.
Operations - Indoor Environment Quality Maintenance	Drip pans pitched in AHU's	This helps promote rapid draining of condensate and reduces opportunity for foreign materials to accumulate inside air handling equipment.
Operations - Indoor Environment Quality Maintenance	Construction regulations: Ventilation, dust control (cover CAV boxes), hazardous material precautions (asbestos, PCB).	Provides for two air changes per hour and encourages use of low VOC materials. Asbestos testing performed before any demo begins. No PCB, asbestos permitted as per specifications)

PROGRAM	DESCRIPTION	IMPACT
Operations - Indoor Environment Quality Maintenance	Outside air fans kept on during hours of HVAC operation.	To provide 20 CFM of outside air per person as per ASHRAE Standards.
Operations - Environmental Impact Reduction	Water Treatment – use of a phosphate based program.	Reduces contribution of heavy metals used as corrosion protection to waste stream.
Operations - Environmental Impact Reduction	Water Treatment- Use of state of art chemicals, daily testing and contribute to reduced water consumption.	Water chemistry program design allows cooling towers to operate effectively at 10 cycles of concentration, significantly reducing water consumption. Use of "Port-o-Feed" system eliminates human and environmental exposure with chemicals, spillage, and waste.
Operations - Environmental Impact Reduction	Use environmentally safe cleaning agents through implementation of "Green Cleaning" program.	Protects finishes and reduces risk to the users.
Operations - Environmental Impact Reduction	Only use trash can liners in wet trash areas.	Reduces use of liners, which are oil based products and harm environment.

4.5 LEED

The proponent is committed to sustainable design as evidenced by the extensive Hines process outlined above, is committed to the U.S. Green Building Council's LEED programs, and is exploring the potential for the project to be LEED certified at a Gold Level.

The most relevant LEED rating system would be the LEED Green Building Rating System for Core and Shell Development (LEED-CS). The core and shell system is suitable for projects where the owner does not have control over interior design and fit-out. The current checklist for LEED-CS is Version 2.0 and is included at the end of this section.

The checklist indicates that the project scope of work includes at least 28 credits and is investigating the most prudent methodology for achieving at least 6 additional credits to achieve a Gold rating. At this juncture, there are 19 credits still being reviewed.

It is anticipated that the project will:

- Develop a sediment and erosion control plan in conformance with US Environmental Protection Agency guidelines;
- Not be developed on a site that includes any of the criteria prohibited by the LEED program (such as farmland, wetlands, habitat for rare and endangered species, etc.);
- Increase localized density;
- Locate people adjacent to public transportation;
- Through the use of a vegetated roof, the project will provide vegetated open space which exceeds local requirements;
- Install a roof system with a high Solar Reflectance Index (SRI);
- Mitigate urban heat island effect by installing parking within the confines of the building structure;
- Minimize the need for irrigation with potable water by utilizing native or adaptive species for landscape and high efficiency irrigation systems;
- Implement technologies to reduce water usage inside the building through use of low flow faucet aerators, dual flush water closet flush valves and low flow urinals;
- Implement fundamental best practice commissioning procedures;
- Design the building to comply with ASHRAE/IESNA 90.1-2004 or the local energy code, whichever is more stringent;

- Utilize refrigerants which have both a low global warming potential and a low ozone depletion factor;
- Optimize energy performance;
- Enact additional commissioning at the end of the warranty period to verify proper and efficient operation of building systems;
- Consider purchase of electrical power from a "GREEN" provider who produces energy through renewable energy sources;
- Provide an easily accessible area that serves the entire building for the separation, collection, and storage of recyclable materials;
- Develop and implement a construction period waste management plan;
- Use construction materials with recycled content;
- Use construction materials that are manufactured regionally;
- Exceed the minimum requirements of voluntary consensus standards for ASHRAE 62-2004, Ventilation for Acceptable Indoor Air Quality;
- Prohibit smoking in the public areas of the building;
- Develop and implement an Indoor Air Quality Management Plan for the construction phase of the building;
- Include low emitting materials, including adhesives and sealants, paints, and carpet systems;
- Minimize cross-contamination of regularly occupied areas by chemical pollutants;
- Achieve direct line of sight to vision glazing for building occupants in 90% of all regularly occupied areas (in office core and shell areas); and
- Include at least one LEED Accredited Professional.

LEED for Core and Shell v2.0
Registered Project Checklist

BVM ENGINEERING

Project Name: Bulfinch Triangle Project
Project Address: New Chardon Street, Boston, MA

Yes	?	No			
6	6	3	**Sustainable Sites**		15 Points
Y			Prereq 1	**Construction Activity Pollution Prevention**	Required
1			Credit 1	**Site Selection**	1
1			Credit 2	**Development Density & Community Connectivity**	1
		1	Credit 3	**Brownfield Redevelopment**	1
1			Credit 4.1	**Alternative Transportation:** Public Transportation Access	1
	1		Credit 4.2	**Alternative Transportation:** Bicycle Storage & Changing Rooms	1
	1		Credit 4.3	**Alternative Transportation:** Low-Emitting and Fuel-Efficient Vehicles	1
		1	Credit 4.4	**Alternative Transportation:** Parking Capacity	1
	1		Credit 5.1	**Site Development:** Protect of Restore Habitat	1
	1		Credit 5.2	**Site Development:** Maximize Open Space	1
	1		Credit 6.1	**Stormwater Design:** Quantity Control	1
	1		Credit 6.2	**Stormwater Design:** Quality Control	1
1			Credit 7.1	**Heat Island Effect,** Non-Roof	1
1			Credit 7.2	**Heat Island Effect,** Roof	1
		1	Credit 8	**Light Pollution Reduction**	1
1			Credit 9	**Tenant Design & Construction Guidelines**	1

Yes	?	No			
3	1	1	**Water Efficiency**		5 Points
1			Credit 1.1	**Water Efficient Landscaping:** Reduce by 50%	1
	1		Credit 1.2	**Water Efficient Landscaping:** No Potable Use or No Irrigation	1
		1	Credit 2	**Innovative Wastewater Technologies**	1
1			Credit 3.1	**Water Use Reduction:** 20% Reduction	1
1			Credit 3.2	**Water Use Reduction:** 30% Reduction	1

Yes	?	No			
5	4	5	**Energy & Atmosphere**		14 Points
Y			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Y			Prereq 2	**Minimum Energy Performance**	Required
Y			Prereq 3	**Fundamental Refrigerant Management**	Required

*Note for EAc1: All LEED for Core and Shell projects registered after June 26th, 2007 are required to achieve at least two (2) points under EAc1.

1	3	4	Credit 1	**Optimize Energy Performance**	1 to 8
			1	10.5% New Buildings or 3.5% Existing Building Renovations	1
				14% New Buildings or 7% Existing Building Renovations	2
				17.5% New Buildings or 10.5% Existing Building Renovations	3
				21% New Buildings or 14% Existing Building Renovations	4
				24.5% New Buildings or 17.5% Existing Building Renovations	5
				28% New Buildings or 21% Existing Building Renovations	6
				31.5% New Buildings or 24.5% Existing Building Renovations	7
				35% New Buildings or 28% Existing Building Renovations	8
		1	Credit 2	**On-Site Renewable Energy**	1
1			Credit 3	**Enhanced Commissioning**	1
1			Credit 4	**Enhanced Refrigerant Management**	1
1			Credit 5.1	**Measurement & Verification** - Base Building	1
1			Credit 5.2	**Measurement & Verification** - Tenant Sub-metering	1
	1		Credit 6	**Green Power**	1

continued...

Yes	?	No			
3	4	4	**Materials & Resources**		11 Points

Y			Prereq 1	**Storage & Collection of Recyclables**	Required
		1	Credit 1.1	**Building Reuse:** Maintain 25% of Existing Walls, Floors & Roof	1
		1	Credit 1.2	**Building Reuse:** Maintain 50% of Existing Walls, Floors & Roof	1
		1	Credit 1.3	**Building Reuse:** Maintain 75% of Interior Non-Structural Elements	1
1			Credit 2.1	**Construction Waste Management:** Divert 50% from Disposal	1
	1		Credit 2.2	**Construction Waste Management:** Divert 75% from Disposal	1
		1	Credit 3	**Materials Reuse:** 1%	1
1			Credit 4.1	**Recycled Content:** 10% (post-consumer + ½ pre-consumer)	1
	1		Credit 4.2	**Recycled Content:** 20% (post-consumer + ½ pre-consumer)	1
1			Credit 5.1	**Regional Materials:** 10% Extracted, Processed & Manufactured Regionall	1
	1		Credit 5.2	**Regional Materials:** 20% Extracted, Processed & Manufactured Regionall	1
	1		Credit 6	**Certified Wood**	1

Yes	?	No		
8	2	1	**Indoor Environmental Quality**	11 Points

Y			Prereq 1	**Minimum IAQ Performance**	Required
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Required
1			Credit 1	**Outdoor Air Delivery Monitoring**	1
1			Credit 2	**Increased Ventilation**	1
1			Credit 3	**Construction IAQ Management Plan:** During Construction	1
1			Credit 4.1	**Low-Emitting Materials:** Adhesives & Sealants (achieve 3 for 2 credits)	2 for 1 credit
1			Credit 4.2	**Low-Emitting Materials:** Paints & Coatings	3 for 2 credits
			Credit 4.3	**Low-Emitting Materials:** Carpet Systems (pursuing for 2/3 of a credit)	4 for 3 credits
	1		Credit 4.4	**Low-Emitting Materials:** Composite Wood & Agrifiber Products	
	1		Credit 5	**Indoor Chemical & Pollutant Source Control**	1
		1	Credit 6	**Controllability of Systems:** Thermal Comfort	1
1			Credit 7	**Thermal Comfort:** Design	1
1			Credit 8.1	**Daylight & Views:** Daylight 75% of Spaces	1
1			Credit 8.2	**Daylight & Views:** Views for 90% of Spaces	1

Yes	?	No		
3	2		**Innovation & Design Process**	5 Points

1			Credit 1.1	**Innovation in Design:** Green Housekeeping	1
1			Credit 1.2	**Innovation in Design:** Exemplary Performance, HI Effect Non-Roof	1
	1		Credit 1.3	**Innovation in Design: 40% Water Use Reduct or 30% recycled content**	1
	1		Credit 1.4	**Innovation in Design:** Green Education or Green Power	1
1			Credit 2	**LEED® Accredited Professional**	1

Yes	?	No		
28	19	14	**Totals (pre-certification estimates)**	61

Certified: 23 to 27 points, **Silver:** 28 to 33 points, **Gold:** 34 to 44 points, **Platinum:** 45 to 61 points

The Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Deval L. Patrick
GOVERNOR

Timothy P. Murray
LIEUTENANT GOVERNOR

Ian A. Bowles
SECRETARY

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October 17, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY & ENVIRONMENTAL AFFAIRS
ON THE
SINGLE ENVIRONMENTAL IMPACT REPORT

PROJECT NAME:	Westinghouse Redevelopment
PROJECT MUNICIPALITY:	Springfield
PROJECT WATERSHED:	Connecticut River
EEA NUMBER:	14205
PROJECT PROPONENT:	Packard Development
DATE NOTICED IN MONITOR:	September 10, 2008

As Secretary of Energy and Environmental Affairs, I hereby determine that the Single Environmental Impact Report (Single EIR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

Project Description

As described in the Single EIR, the project involves the redevelopment of the Westinghouse site in Springfield, MA. The project site is approximately 40 acres of mostly developed land bounded by Page Boulevard (Route 20A) to the north and Interstate 291 (I-291) to the south. The site currently contains approximately 916,000 square feet (sf) of development in the form of multiple warehouses, manufacturing buildings and surface parking. The project includes the complete redevelopment of the project site with approximately 470,000 sf of retail and restaurant uses and 2,012 parking spaces (1,022 net new spaces). The project is expected to generate approximately 16,700 new vehicle trips on a typical weekday and 22,900 new vehicle trips on a typical Saturday. The project also includes the development of enhanced stormwater management facilities, traffic and pedestrian access improvements, remediation of contaminated

land, connections and upgrades to water and sanitary sewer facilities, and new landscaped areas within the project site.

Jurisdiction

The project is undergoing environmental review and requires the preparation of an EIR pursuant to the following sections of the MEPA regulations: 301 CMR 11.03(6)(a)(6), because it will generate more than 3,000 new average daily trips (adt) on roadways providing access to a single location; and 301 CMR 11.03(6)(a)(7), because it involves the construction of more than 1,000 new parking spaces at a single location. The project requires a National Pollutant Discharge Elimination System (NPDES) General Construction Permit from the U.S. Environmental Protection Agency (EPA); an Indirect Highway Access Permit from the Massachusetts Highway Department (MassHighway); and approval from the Department of Environmental Protection (MassDEP) under the Massachusetts Contingency Plan (MCP) . The project is subject to the EEA Greenhouse Gas (GHG) Emissions Policy and Protocol.

Because the Proponent is not seeking financial assistance from the Commonwealth for the project, MEPA jurisdiction is limited to those aspects of the project that may cause Damage to the Environment as defined in the MEPA regulations and that are within the subject matter of required or potentially required state permits. In this case, jurisdiction extends to transportation and hazardous waste.

Changes Since the Filing of the Expanded ENF

The project has changed slightly since the filing of the Expanded Environmental Notification Form (EENF) in response to comments received on that document. Changes include:

- Relocation of the unsignalized driveway off Page Boulevard such that the entrance is approximately 140 feet to the east of Edendale Street;
- Construction of sidewalk improvements on Stevens Street, pedestrian connections to crossings on Page Boulevard, enhanced internal paths and connections, and benches, landscaping and lighting;
- Reduction of total number of parking spaces from 2,059 to 2,012;
- Additional groundwater recharge in the rear of the project parcel; and
- Commitments to additional GHG reduction measures.

Review of the Single EIR

The Single EIR included a description of the project, a summary of changes since the filing of the EENF and a listing of permits and approvals and project phasing. The Single EIR included a summary of project alternatives that were investigated as part of the EENF and addressed site layout modifications to facilitate improved pedestrian flow and connections to the

adjacent neighborhood. Existing structures on-site will not be reused; however the Proponent has indicated a willingness to investigate incorporation of the on-site radio towers into the future design layout. The Single EIR contained a summary of how the number of on-site parking numbers were derived and presented a plan that reduces the number of parking spaces by 47 spaces. Parking areas will be available to provide additional parking for neighborhood uses.

Traffic

The Single EIR included a supplemental traffic assessment in response to comments received on the EENF. This supplemental information was prepared in accordance with the EOEEA/EOTPW Guidelines for Traffic Impact Analysis. The traffic assessment evaluated an additional intersection (Roosevelt Avenue at Bay Street) at the recommendation of MassHighway, presented additional improvements to address existing deficiencies, outlined additional traffic mitigation measures, and included updated Transportation Demand Management (TDM) measures. EOTPW has indicated that the Single EIR adequately analyzed the project's traffic impacts and proposed mitigation measures that will address the impact on the State highway system.

I have received several comments pertaining to proposed traffic mitigation measures, including those on local roadways. I strongly encourage the Proponent to continue to work with the City of Springfield, local business owners and residents to ensure that traffic impacts associated with the project are appropriately mitigated. Comments on the traffic analysis include concerns related to the impact of the AM peak hour on signal coordination efforts and street pattern changes along Page Boulevard. Additional comments were received concerning available queue lengths and storage capacities in the project area. I strongly encourage the Proponent to expand its traffic monitoring plan to incorporate the comments submitted on behalf of the City of Springfield by their traffic consultant and to continue to evaluate additional mitigation measures related to queue length and pedestrian accommodations during the ongoing City of Springfield permitting process.

Greenhouse Gas Emissions

The Single EIR included an expanded GHG analysis in response to the Certificate on the EENF and in accordance with the EEA Greenhouse Gas Emissions Policy and Protocol (the Policy). Additionally, during the Single EIR comment period, the Proponent submitted additional information clarifying the content presented in the Single EIR. The Single EIR has presented an estimated GHG reduction of 33 percent for stationary sources and 10 percent for mobile sources in comparison to the code compliant base case as outlined in the Policy. Reductions in GHG emissions have been achieved through commitments to implement transportation demand management (TDM) measures, intersection improvements, and building design and operations improvements. These measures include the use of high efficiency HVAC systems, installation of white colored thermoplastic olefin (TPO) membrane roofing, efficient lighting and windows, and the purchase of 35 percent green power to meet energy demand from one of the anchor retail stores. The specific measures are detailed in the section on Mitigation and Section 61 Findings below.

The Single EIR notes that the project will be designed to be compliant with the Massachusetts State Building Code and as design progresses and tenants are identified, the Proponent will work to evaluate and encourage the incorporation of energy efficient systems. The Proponent is reminded that the recently passed Green Communities Act, Chapter 169 of the Acts of 2008, requires that the International Energy Conservation Building Code be adopted and fully integrated into the State building code. The Massachusetts requirements will therefore be changing, and the new standards may apply to buildings constructed as part of this project.

I acknowledge the difficulty in confirming the amount of GHG reductions possible in buildings whose tenants and uses are unknown at the time of MEPA review. The Single EIR does provide a discussion of GHG mitigation commitments associated with the two anchor stores, as these tenants are presently known. The two anchor stores represent approximately 50 percent of the project's total carbon emissions. However, I share MassDEP's concern that the Proponent's efforts to encourage future tenants to adopt additional GHG mitigation measures may or may not result in tangible GHG reductions. MassDEP has suggested two means to reconcile the inability of the Proponent to make project-wide GHG reduction commitments while demonstrating reasonable compliance with the GHG Policy. These include:

1. a commitment by the Proponent to increase its investment in mitigation measures for the project components it controls, with an allowance to reduce that commitment if the anticipated GHG reduction from future tenants materialize; or
2. a commitment by the Proponent to retain on its development team or otherwise make available, without charge, to prospective tenants a person with sufficient expertise to provide an energy assessment of alternative building designs and operating systems under consideration.

I strongly encourage the Proponent to make these additional commitments to further ensure that all feasible GHG reduction measures are incorporated into the project.

In addition, the Single EIR stated that solar photovoltaic (PV) systems are not being included amongst the project's mitigation commitments. The Single EIR analyzed the installation of a 50kW solar PV system as a supplemental source of energy, capable of generating approximately 61,320 kWh in its first year, or 5,110 kWh per month. The Single EIR estimated the payback period of the installation for each anchor retail building at approximately seven years. The Single EIR also cited uncertainty in government tax credits as an additional challenge in implementing solar PV on-site. In light of the recent extension of federal tax credits for solar PV systems, the likely continued rise in the electricity prices, the continued reduction in the cost of PV, opportunities for third party PV arrays with power purchase agreements, and new opportunities for utility ownership of solar installations, I strongly encourage the Proponent to revisit its analysis of the projected payback period with a more realistic projection of the revenue stream as suggested in MassDEP's comment letter. In addition, the recently passed Climate Protection and Green Economy Act, M.G.L.c. 21N, mandates economy-wide reduction targets for greenhouse gas emissions in Massachusetts of between 10 and 25 percent by 2020. I second the recommendation of MassDEP that the Proponent consider the potential advantages of early GHG reduction under the new law. I also encourage the Proponent to construct the facility with

consideration for the added weight of future PV systems so that they may be installed in the future based upon tenant needs.

Upon completion of construction, the Proponent should provide a certification to the MEPA Office signed by an appropriate professional (e.g., engineer, architect, general contractor) indicating that the all of the mitigation measures referenced in the Section on Mitigation and Section 61 Findings below, or equivalent measures that collectively will reduce stationary source GHG Emissions by 33 percent and mobile GHG emissions by 10 percent, have been incorporated into the project. The certification should be supported by as-built plans. For those measures that are operational in nature (i.e. TDM, recycling) the Proponent should provide an updated plan identifying the measures, the schedule for implementation and how progress towards achieving the measures will be obtained. MassHighway should incorporate this self-certification requirement into its Section 61 finding for this project.

Hazardous Materials

The Single EIR included a brief update on ongoing hazardous waste remediation activities in accordance with M.G.L. 21E or the Massachusetts Contingency Plan (MCP) on-site. Historically there have been as many as three release conditions at the project site listed with MassDEP. One of these Release Tracking Numbers (RTN) remains active (1-15982), the other two RTN's (1-16658 and 1-16661) have achieved closure through the submittal of a Response Action Outcome (RAO) statement. The Single EIR notes that the active RTN 1-15982 is currently in Phase II of the MCP investigations. Additional investigation and reports are currently being prepared to address the associated release conditions and to specify that the project will result in the resolution of the RTN. MassDEP has noted that the Phase IV – Remedy Implementation Plan, as described in 310 CMR 40.0874, should be submitted to MassDEP, unless an RAO statement is submitted prior to December 9, 2008. If these requirements cannot be met, the Proponent will need to file an application for a Tier II Extension with MassDEP.

Construction Management

The Single EIR described various construction management techniques to be utilized during the construction period to limit environmental impact. The Single EIR discussed erosion and sedimentation controls, site preparation, construction staging and general construction requirements, how the project will comply with NPDES permitting requirements, and efforts to mitigate noise, dust and air quality impacts during construction activity. The Single EIR confirmed that all construction debris will be handled, managed, and disposed of in accordance with applicable regulations, including the "waste bans" as applicable at local solid waste facilities in the project areas. Also, the Proponent has noted that solid waste/debris will be managed and disposed of in accordance with MassDEP's Waste and Recycling Regulations and Standards (310 CMR 16.00 and 310 CMR 19.000). The Single EIR stated that, if feasible, existing steel/metal, asphalt, brick, and concrete will be recycled and/or reused on-site. Asbestos-containing waste will be managed in accordance with MassDEP's Solid Waste Management regulations (310 CMR 19.061) for "special waste."

Stormwater and Utilities Infrastructure

The Single EIR responded to questions raised in comments on the EENF related to stormwater, water and wastewater. The Single EIR included a discussion and supporting data to confirm compliance with MassDEP's Stormwater Management Standards dated January 2, 2008, including additional information on additional stormwater recharge efforts incorporated into the site design. The City of Springfield Planning and Economic Development Department comment letter notes several additional design measures that may need to be adjusted during the design and construction process to ensure that the stormwater management system works effectively. The Single EIR noted that the site is adequately served by existing water and sewer infrastructure, and sufficient capacity exists to serve the project.

Permitting

MassDEP has indicated in their comment letter on the Single EIR that the project may be subject to 314 CMR 5.00 *Ground Water Discharge Permitting Program Regulations* as currently proposed for revision. The revised regulations will require a General Permit for stormwater discharge into the ground from parking lots with high intensity use. The Proponent should remain apprised of the potential approval of these regulations and obtain the required permit if applicable. Additionally, MassDEP has noted that the project will require Underground Injection Control Program Registration or a Groundwater Discharge Permit for underground, stormwater infiltration structures. The Proponent should work with MassDEP regarding the appropriate regulatory application. MassDEP has stated that mitigation measures can adequately be addressed through the registration or permitting process, if applicable. However, should material changes to the project be required as a result of the permitting or registration requirements, a Notice of Project Change pursuant to 301 CMR 11.10 may be required.

The Proponent should update project Section 61 findings to specify that, upon occupancy of the site, should the traffic monitoring protocol indicate unsafe conditions at the intersection of I-291 on- an off-ramps with Page Boulevard, revised pavement markings for acceleration and deceleration lanes should be provided as originally requested by MassHighway. Additionally, the Proponent should coordinate with MassHighway on physical or timing modifications to traffic signals at Roosevelt Avenue/Page Boulevard, Roosevelt Avenue/Bay Road, and Page Boulevard/I-291 off-ramp. MassHighway has noted that the traffic monitoring plan should also include counts for the AM peak period to help optimize the morning coordination plan for these traffic signals.

Mitigation and Draft Section 61 Findings

As required, the Single EIR included updated draft Section 61 findings. The Proponent has committed to the following mitigation measures as summarized below:

Traffic

- The project will have two new signalized access points along Page Boulevard, one across from East Street and the other will utilize Stevens Street. There will also be a right-in/right-out only driveway proposed along Page Boulevard, located between the two signalized access points. Truck deliveries will utilize Stevens Street to access the back of the larger retail buildings on the south side of the site. These driveways will replace the approximately five existing unsignalized curb cuts that serve the site today.

  Widen Page Boulevard to provide four lanes of travel (two lanes in each direction) between Roosevelt Avenue and Stevens Street. Provide striping of on-street parking spaces along both sides of Page Boulevard (between Stevens Street and Jenness Street on the north side and Stevens Street and right-in/right-out project drive on the south side). Provide sidewalks, pedestrian accommodations and landscaped buffers along Page Boulevard.

- Widen Stevens Street to provide three lanes of travel (two northbound lanes and one southbound lane) between Page Boulevard and the project driveway. Modify Stevens Street to provide two lanes of travel and an 8-foot on-street parking lane (on the west side) between the north project driveway and Eureka Street. Reconstruct the sidewalk on the east side of Stevens Street from Page Boulevard to approximately 400-feet south of the north project drive. Install two "No Truck" signs on Eureka Street, facing Stevens Street.

- The Proponent will make intersection improvements at Page Boulevard at Roosevelt Avenue including:
  - Curb cut and lane modifications;
  - Optimization of the intersection's cycle length and associated signal timing changes at the intersection of I-291?Interchange 5 westbound off-ramp; and
  - Coordination with signals located on Page Boulevard at East Street and Stevens Street.

- The Proponent will make intersection improvements at the Page Boulevard at East Street/Prentice Street/Proposed East Site Driveway including:
  - Widening and restriping of the intersection to provide turning and through lanes;
  - Sidewalk improvements and enhanced pedestrian crosswalks;
  - Installation of a three-phase actuated-coordinated traffic control signal;
  - Closure of the entrance to Prentiss Street;
  - Coordination of the traffic signal with signals located on Page Boulevard at the I-291/Interchange 5 westbound off-ramp, Roosevelt Avenue and Stevens Street.

- The Proponent will make intersection improvements at the Page Boulevard at Stevens Street intersection including:
  - Widening and restriping of the intersection to provide turning and through lanes;
  - Sidewalk improvements and enhanced pedestrian crosswalks;

- Coordination of the traffic signal with signals located on Page Boulevard at the I-291/Interchange 5 westbound off-ramp, Roosevelt Avenue and East Street.
- Investigation of the need for installing signage and pavement markings to discourage vehicle queues from blocking the Page Boulevard/Osborne Terrace intersection.

Alteration of the East Street at Roosevelt Avenue/Price Street intersection to provide safer and more efficient operations. Improvements include the construction of a raised island to direct northbound East Street traffic to the right allowing traffic to intersect Roosevelt Avenue at a right angle.

- Implementation of a Travel Demand Management (TDM) program. The program proposes to:

  - Facilitate bicycle and pedestrian travel by providing bicycle racks, sidewalks, and signalized pedestrian crossings;
  - Provide improved access from the Project to transit with on-site PVTA bus service;
  - Encourage tenants to offer direct deposit to their employees;
  - Encourage tenants to provide a guaranteed ride home program;
  - Provide preferential carpool and vanpool parking within the parking lots to promote ridesharing;
  - Encourage tenants to provide subsidies who purchase monthly or multiple trip transit passes;
  - Encourage tenants to hold promotional events for employees and/or customers that choose alternative transportation modes; and,
  - Provide on-site services such as ATMs, restaurants, etc. to reduce the need for employees to leave the retail center.

- Conducting a Traffic Monitoring Plan that will count traffic trips and turning movements entering and exiting all of the project driveways and at selected project intersections six (6) months following the opening of the project and again upon 85 percent occupancy (or, in any event, within three years of opening). The Proponent will prepare a memorandum of the results to the City of Springfield and MassHighway and if additional mitigation measures are necessary will coordinate with the City of Springfield.

GHG

- Mobile Source GHG emissions will be mitigated through the implementation of the traffic-related mitigation measures outlined above.

- In buildings the Proponent will construct, lease and maintain, the following mitigation measures will be implemented to offset stationary source GHG emissions:
  - High-efficiency Energy Star-compliant packaged HVAC systems (EER=10);
  - 80 percent heat efficiency;
  - Installation of motion sensors in non-display areas;

- White colored thermoplastic olefin (TPO) membrane roofing;
- Installation of double low-e windows; and
- Finish building ceilings.

- In Anchor Retail Store A (constructed and maintained by tenants) the following mitigation measures will be implemented to offset stationary source GHG emissions:
  - High-efficiency Energy Star-compliant packaged HVAC systems (EER=11.4);
  - 80 percent heat efficiency;
  - Installation of motion sensors in non-display areas;
  - Installation of efficient lighting in display and interior areas;
  - Installation of double low-e windows; and
  - Finish building ceilings.

- In Anchor Retail Store B (constructed and maintained by tenants) the following mitigation measures will be implemented to offset stationary source GHG emissions:
  - High-efficiency Energy Star-compliant packaged HVAC systems (EER=10);
  - 80 percent heat efficiency;
  - Installation of motion sensors in non-display areas;
  - White colored thermoplastic olefin (TPO) membrane roofing;
  - Installation of efficient lighting; and
  - Finish building ceilings.

- The Proponent will install Energy-Star equipment will in buildings it operates.

- One of the Anchor Retail stores will purchase 35 percent of its energy from a Green Power source that utilizes renewable resources. The preliminary estimate of the stationary source GHG emission reductions due to the use of Green Power is approximately 158.1 tons per year (tpy).

The Single EIR presented draft Section 61 findings that addressed traffic-related mitigation measures. These Section 61 findings must be expanded to include GHG mitigation measures in accordance with the GHG Policy. The final Section 61 findings will be included with all state permits issued for this project, and will be considered binding upon the proponent as mitigation commitments. In accordance with Section 11.12 (5) (e) of the MEPA regulations, final Section 61 findings must be forwarded by each permitting agency to the MEPA Office, which will publish a Notice of Availability in the Environmental Monitor.

As noted elsewhere in this Certificate, the Proponent should provide a certification to the MEPA Office signed by an appropriate consultant (e.g., engineer, architect, general contractor) indicating that the all of the above referenced mitigation measures have been incorporated into the project. The certification should be supported by as-built plans. For those measures that are operational in nature (i.e. TDM, recycling) the Proponent should provide an updated plan identifying the measures, the schedule for implementation and how progress towards achieving measures will be obtained. This self-certification will be a requirement of the MassHighway Section 61 finding for this project.

Conclusion

I find the Single EIR to be adequate and am allowing the project to proceed to the state agencies for permitting. The Single EIR contained adequate information on project impacts and mitigation, and provided the state permitting agencies with sufficient information to understand the environmental consequences of their permit decisions. No further MEPA review is required.

October 17, 2008
Date

Ian A. Bowles

Comments received:

10/09/2008	East Springfield Neighborhood Council
10/09/2008	Pioneer Valley Planning Commission
10/09/2008	Springfield Preservation Trust
10/09/2008	Joseph Freedman Co., Inc.
10/10/2008	Massachusetts Department of Environmental Protection – WERO
10/10/2008	City of Springfield – Planning and Economic Development
10/10/2008	Sheet Metal Workers International Association
10/10/2008	Executive Office of Transportation and Public Works
10/10/2008	Massachusetts Department of Environmental Protection and Department of Energy Resources (joint letter)

IAB/HSJ/hsj

H2

RECEIVED

OCT 6 - 2008

MEPA

Transportation
Land Development
Environmental
Services

VHB Vanasse Hangen Brustlin, Inc.

101 Walnut Street
P. O. Box 9151
Watertown, MA 02471-9151
617 924 1770
FAX 617 924 2286

Memorandum

To: Holly Johnson, MEPA Analyst

CC: DISTRIBUTION LIST

Date: October 2, 2008

Project No.: 09832.00

From: Tom Wholley
Lauren DeVoe

Re: EOEA#14205 – **Westinghouse Redevelopment**
Clarification Information on the September 2008 SEIR

Per your request, the following memo provides clarification information, for the Single Environmental Impact Report (SEIR) submitted to your MEPA Office on September 2, 2008 for the Westinghouse Redevelopment project in Springfield, Massachusetts [EEA No. 14205] (the "Project").

1. *Clarify what TDM measures were included in modeling (commitments vs. encouragements) and provide the back up from the EPA COMMUTER model which identifies how reductions were calculated. For clarity, compare reductions from commitments only to reductions with commitments plus encouragements.*

   The EPA COMMUTER model calculates the percentage of Project-related trip reductions that can be achieved due to Transportation Demand Management (TDM) measures. The EPA COMMUTER model back-up data is enclosed.

   For clarification, those TDM measures committed to by the Proponent (as listed on page 2-18 of the SEIR) were modeled and quantified for GHG emission reductions. These measures include site-wide improvements aimed at discouraging single-occupancy vehicle trips (e.g., bicycle and pedestrian facilities; public transit). The TDM measures that will be encouraged were not modeled, as they are for buildings the Proponent does not control and cannot be committed to at this time.

2. *Provide backup data for PV calculation. Confirm that MTC calculator includes state and federal tax credits. Did the analysis consider the benefits of net metering?*

   See the attached Massachusetts Technology Collaborative calculator back-up for the proposed 50 kilowatt-hour (kWh) solar photovoltaic panel (PV) system (as presented in the SEIR). As indicated in the calculator under 'Tax Assumptions', a state tax deduction of 100% and a federal tax credits of 30% were assumed.

   Net metering is designed to allow a building owner to be paid back by the utility company for any excess energy that can be fed back into the grid (if such a program is available). In a commercial application such as the Project, the proposed PV

system would only supplement a portion of the electric demand and no excess energy would be anticipated. The proposed 50 kWh PV system is projected to generate 61,320 kWh in its first year (declining in efficiency as the system ages). Anchor Retail A is projected to use 1,502,000 kWh annually and Anchor Retail B is projected to use 2,032,000 kWh annually (refer to the EQUEST model back-up data provided in Appendix C). Furthermore, the Project would be open most days and late most nights of the year, which means the lights are on and electricity is being used, so that there would be limited daylight periods in which the stores would be shut down and sunlight could be converted to excess electricity.

3. *Provide additional details on the Green Power Purchasing program and how the reductions were calculated. How was 35% chosen? How does this convert to 158tpy reductions?*

   In discussions with potential tenants to develop GHG improvements, the representative of Anchor Retail Building A has committed to the purchasing of a minimum of 35 percent green power. EQUEST was used to calculate the total electrical usage for Anchor Retail Building A, which resulted in 816.12 Mwh/yr, or 451.72 tons per year of GHG emissions. The green power component represents 35 percent of the total 816.12 Mwh/yr, or 285.6 Mwh/yr, which converts to an estimated reduction of 158 tons per year in GHG emissions (refer to Appendix C of the SEIR for conversion factors used). The back-up calculations of GHG emission reductions related to green power purchasing are enclosed.

4. *Clarify which buildings the proponent will own and apply its emission reduction program to. Also, clarify why specific uses identified in the EENF (i.e. pet store) were changed to more general uses.*

   As mentioned in the SEIR, the Proponent will construct, lease and maintain the Neighborhood Retail and Restaurant uses (as identified on Figure 1.3) and will apply those emission reduction improvements listed on page 3-10 under 'Proponent Building Improvements.'

   The specific retail uses were prematurely identified in Appendix C of the February 2008 Expanded ENF. The retail uses were re-characterized in the SEIR (Appendix C) to be more general because no tenants have been secured. The square footage of the buildings remain the same and were re-labeled from left to right as Retail A, Retail B, Retail C, etc. The EQUEST model is affected most by general use type (office vs. retail), building size and footprint shape; not by specific retail use types. Therefore, this minor change did not affect the GHG results in any way.

5. *Clarify that Energy Star reductions were not analyzed.*

   As stated on page 3-12 of the SEIR, the Proponent will commit to installing Energy Star equipment (appliances, such as refrigerators or microwaves in break rooms and computers at work stations) in the buildings they will own, operate and lease out (specifically, the Neighborhood Retail and Restaurants). All other tenants that fit-out the other buildings will be strongly encouraged to do the same.

   It is not possible at this stage of design to quantify the reduction in GHG emissions of these appliances because the number and types of appliances are based on future tenant demand and are not known at this time. This level of detail is required to understand how much more efficient the Energy Star appliances would be compared to conventional appliances.

COMMUTER MODEL RESULTS

SCENARIO INFORMATION

Description	Westinghouse Redevelopment
Scenario Filename	westinghouse-spfld1.vme
Emission Factor File	
Performing Agency	VHB
Analyst	Robert Ricchi
Metropolitan Area	Springfield, MA
Area Size	3 - Small (under 750,000)
Analysis Scope	2 - Site or Employer-Based
Analysis Area/Site	shopping center
Total Employment	1,749

PROGRAMS EVALUATED

X	Site Walk Access Improvements
X	Transit Service Improvements
	Financial Incentives
X	Employer Support Programs
	Alternative Work Schedules

	User-Supplied Final Mode Shares

MODE SHARE IMPACTS

Mode	Baseline	Final	%Change
Drive Alone	78.2%	75.9%	-2.4%
Carpool	12.1%	12.5%	+0.3%
Vanpool	0.5%	0.7%	+0.2%
Transit	4.9%	6.5%	+1.6%
Bicycle	0.4%	0.5%	+0.1%
Pedestrian	3.0%	3.1%	+0.1%
Other	0.8%	0.8%	-0.0%
No Trip	-	0.0%	+0.0%
Total	100.0%	100.0%	-

Shifted from Peak to Off-Peak	0.0%

TRAVEL IMPACTS (relative to affected employment)

Quantity	Peak	Off-Peak	Total
Baseline VMT	22,558	14,181	36,739
Final VMT	21,986	13,822	35,808
VMT Reduction	571	359	931
% VMT Reduction	2.5%	2.5%	2.5%
Baseline Trips	1,798	1,130	2,928
Final Trips	1,750	1,100	2,851
Trip Reduction	47	30	77
% Trip Reduction	2.6%	2.6%	2.6%

DRAFT 5.0 Non-Residential Solar Photovoltaic Project Simple Financial Model (02/07/08)
DATA ENTRY AND FINANCIAL SUMMARY

Key

Entry Cells	
Cells Draw Data from Another Worksheet	
Calculation Cells (Not for Entry)	

Select Taxable or Non-Taxable Entity: Taxable

Project and Customer Cost Assumptions

Solar Photovoltaic System Size	50,000	Watts (DC STC)
Total System Cost/Watt	$ 7.50	$/Watt (DC STC)
Total System Cost	$ 375,000	

MTC Rebate Assumptions

MTC Scenario A: Non-Taxable Rebate	$ 3.125	$/Watt (DC STC)
Scenario A Rebate	$ 156,250	
MTC Scenario B: Taxable Rebate	$ 3.125	$/Watt (DC STC)
Scenario B Rebate	$ 156,250	

Project Performance and Savings/ Cost Assumptions

Annual Net Capacity Factor	14.0%	kW (DC STC) to kWh AC
Annual Production Degradation	0.50%	%
Project Life	25	Years
Electricity Revenue (Avoided Costs)	$ 0.15	$/kWh
Electricity Revenue (Avoided Costs) Annual Adjustor	3.0%	%
Renewable Energy Certificate (REC) Revenue	$ 0.04	$/kWh
REC Revenue Annual Adjustor	0.0%	%
REC Revenue Term	4	Years (must be equal to or less than project life)
Annual Operations and Maintenance Cost	$ 250	$/Year
Annual Operations and Maintenance Adjustor	3.0%	%
Future Inverter Replacement Cost	$ 0.75	$/Watt (DC STC)
Inverter Life, Replace Every X Years	15	Year (must be equal to or less than project life)

Scenario Definitions

Scenario A: Non-Taxable Rebate - Assumes that the state rebate is non-taxable, but is subtracted from the cost basis for purposes of determining tax credits and accelerated depreciation.

Scenario B: Taxable Rebate - Assumes that the state rebate is taxable, but is not subtracted from the cost basis for purposes of determining tax credits and accelerated depreciation.

Both Scenarios assume that the project owner can use both federal and state tax benefits

Tax Assumptions

Federal Tax Rate	35%					
State Tax Rate	9%					
Effective Tax Rate	41%					
Federal Tax Credit	30%					
State Tax Deduction	100%					
5 Year Accelerated Depreciation Schedule (MACRS)	20.00%	32.00%	19.20%	11.52%	11.52%	5.76%

Financing Assumptions

% Financed w/ Cash	100%	
% Financed w/ Loan	0%	
Loan Interest Rate	8%	
Loan Period	20	Years (must be equal to or less than project life)
Scenario A Net Cost	$ 218,750	
Scenario A Loan	$ -	
Scenario B Net Cost	$ 218,750	
Scenario B Loan	$ -	
Customer Discount Rate	8%	

Solar Project Financial Analysis Summary

Scenario A: Net Present Value	$ (25,321)
Scenario A: Simple Payback (100% Cash only)	Year 12
Scenario A: Estimated Return on Equity	5.3%
Scenario A: Guess Return on Equity	50%
Scenario B: Net Present Value	$ 5,159
Scenario B: Simple Payback (100% Cash only)	Year 6
Scenario B: Estimated Return on Equity	8.6%
Scenario B: Guess Return on Equity	50%

Green Power Purchase Program

	Total Elec. (Mwh)	CO2 from electricity (lbs)	s (tons)
Total Electric Usage from E-Quest	816.12	903444.84	451.72
35% Reduction due to Green Power Purchase	-285.64	316205.69	158.10
Total Electric Consumption after 35% Reduction	530.48	587239.15	293.62

Convert Mwh to lbs *1107

Convert lbs to s (tons) *.0005

To: Holly Johnson
From: MassDEP and DOER
Re: GHG Policy Comments for Westinghouse Redevelopment-EEA No. 14205
Date:10/10/8

The proponent has expanded upon the analysis presented in the EENF with the inclusion of the E-Quest model results, and has increased the projected GHG reductions from 14 to 33%. That level of reduction, if achieved, is commendable. It has identified the mitigation commitments for the project components it will construct and the mitigation measures that the two current anchor tenants are reasonably likely to adopt. These measures include double E windows, Energy Star HVAC systems, motion sensors for lighting, efficient lighting, white roofs and finished ceilings. What is lacking from this basic efficiency package are two measures most proponents adopt: more insulation than required by the building code and duct sealing, measures other proponents have represented to be very cost efficient for the energy reductions obtained. One of the anchor stores has committed to purchase an impressive 35% "Green Power", a significant percentage of the total build with mitigation $C0_2$ reductions. In addition, the proponent represents that it will install Energy Star appliances and computer equipment in the buildings it operates and encourage prospective tenants to do the same.

The MEPA GHG Policy states that the project baseline for energy usage should be based on code-compliant buildings. Therefore, implemented energy mitigation measures for the project are expected to extend beyond meeting the MA State Building Code. The project proponent notes that all new buildings will be designed to be code compliant (page 1-4), and that as design progresses and tenants are further identified, the Proponent will work to evaluate and encourage the incorporation of energy efficient systems. Given the MEPA GHG Policy, all buildings should be designed to exceed MA State Building Code. Although some building energy efficient measures *may* result in higher upfront capital costs, the life cycle energy costs will be reduced, providing attractive annual operating costs for tenants. In addition, MA is moving towards more aggressive energy codes and targets for buildings. The recently passed Green Communities Act requires that the International Energy Conservation Building Code be adopted and fully integrated into the state building code and therefore the MA requirements will be changing. Also, the Governor's Zero Net Energy Task Force will be providing recommendations this Spring for providing a path for achieving broad marketability for zero net energy buildings by 2020 and universal adoption of zero net energy practices for new construction by 2030.

The proponent rejects installation of solar PV for economic reasons, based on the MTC payback calculator. Their analysis raised concerns about the continuation of the Federal Investment Tax Credit. Recent federal legislation has extended the credit, so that uncertainty has been removed. In addition, the Department questions the REC revenue input of only 4 years, rather than the expected lifetime of the project. A more realistic projection of the revenue stream would positively affect the payback period. The recent adoption of the Global Warming Solutions Act anticipates that all significant sources of GHG will need to be appropriately mitigated in order to meet the Act's target for net CO_2 reductions in 2020. The Act establishes an accelerated timetable for the adoption of regulations to implement those measures, and specifically directs

that the regulations "ensure that entities that have voluntarily reduced their greenhouse gas emissions prior to the implementation of this section receive appropriate credit for early voluntary reductions". The Department suggest that the proponent revisit the MTC calculator and consider the potential advantages of early GHG reduction in order to re-assesses the economics of PV prior to making construction commitments that would make the subsequent installation of PV more expensive.

The SEIR provides a limited number of firm commitments to GHG mitigation measures, and the anticipated measures for the tenant designed buildings are limited to the two anchor stores. The two anchors represent approximately 50% of the project's total carbon emissions. It is not clear what portion of the balance of emissions is subject to the proponent's mitigation commitments and what is presently uncommitted until tenants are identified and building designs are confirmed. The proponent indicates that it will encourage future tenants to adopt the measures its analysis incorporates.

The Department recognizes that the proponent is not in a position to make firm mitigation commitments on all the project's components under its development plan. But "encouragement" is a vague term by which to measure compliance with the GHG Policy for what appears to be a substantial portion of the project's GHG emissions. Encouragement can run the gamut from a passing conversation to financial incentives through mechanisms such as "green" leases where the developer and the tenant share the operational cost savings from the energy efficiency design and construction investment. The Department offers two suggested means to reconcile the inability of the proponent to make project-wide GHG reduction commitments while demonstrating reasonable compliance with the GHG Policy. The proponent could commit to increase its investment in mitigation measures for the project components it controls, but be allowed to reduce that commitment if the anticipated GHG reductions from future tenants materialize. Alternatively, the proponent could commit to retain on its development team or otherwise make available, without charge, to prospective tenants a person with sufficient expertise in energy efficiency and renewable energy sources to provide an energy assessment of alternative building designs and operating systems under consideration. The tenant may have its own expert, and decline the offer.

Whether or not either of the suggestions is adopted, the proponent should be required to report back to the Secretary at the appropriate stage in project development on the extent to which the representations on the prospective mitigation measures in the SEIR or alternative measures with equivalent or superior energy performance characteristics are implemented.

HJ

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION

EOT

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

BERNARD COHEN
SECRETARY

October 10, 2008

Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RE: Springfield – Westinghouse Redevelopment – SEIR
(EOEA #14205)

ATTN: MEPA Unit
Briony Angus

Dear Secretary Bowles:

On behalf of the Executive Office of Transportation and Public Works, I am submitting comments regarding the proposed Westinghouse Redevelopment project in Springfield, as prepared by the Office of Transportation Planning. If you have any questions regarding these comments, please call J. Lionel Lucien, P.E., Manager of the Public/Private Development Unit, at (617) 973-7341.

Sincerely,

David J. Mohler
Deputy Secretary for Planning

DJM/jll

cc: Luisa Paiewonsky, Commissioner
Frank Tramontozzi, P.E., Chief Engineer
Albert Stegemann, P.E., District 2 Highway Director
Neil Boudreau, State Traffic Engineer
PPDU files
MPO Activities files
Planning Department, City of Springfield
Pioneer Valley Planning Commission

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION AND PUBLIC WORKS
OFFICE OF TRANSPORTATION PLANNING

MEMORANDUM

TO: David Mohler, Deputy Secretary for Planning
Executive Office of Transportation and Public Works

FROM: J. Lionel Lucien, P.E., Manager,
Public/Private Development Unit

DATE: October 10, 2008

RE: Springfield – Westinghouse Redevelopment – SEIR
(EOEEA #14205)

The Public/Private Development Unit has reviewed the Single Environmental Impact Report (SEIR) for the proposed Westinghouse Redevelopment in Springfield. The project will be located on a 40-acre parcel of land, which is currently occupied by 916,000 square feet of manufacturing and warehouse space. The parcel is generally bounded by I-291 to the south, Roosevelt Avenue to the east, Page Boulevard to the north, and Stevens Street to the west. Access along Page Boulevard will be modified to include a right-in/right-out access drive between Jenness Street and Edendale Street and a full access drive that will align with Prentice Street. In addition, a new access point will be provided along Stevens Street. This project proposes the demolition of the existing structures on the site, the construction of approximately 470,000 square feet of retail and 2,012 parking spaces. Based on Land Use Code 820 (Shopping Center), the project is estimated to generate a total of 18,600 vehicle trips on an average weekday and 24,500 vehicle trips on an average Saturday. A MassHighway access permit is required for indirect access to I-291 via Page Boulevard.

The SEIR includes a transportation impact study that generally conforms to the EOEEA/EOTPW Guidelines for Traffic Impact Assessment. The SEIR has adequately analyzed the project's traffic impacts and proposed mitigation measures that will address the impact on the state highway system. In order to mitigate the transportation-related impacts of this project, the proponent has committed to implement physical roadway improvements and traffic control improvements. Improvements will be implemented at the Page Boulevard/East Street/Prentice Street/Proposed Site Driveway, the Page Boulevard/Stevens Street intersection, and the East Street/Roosevelt Avenue/Price Street intersection. Additionally, Page Boulevard will be widened to accommodate four travel lanes between Roosevelt Avenue and Stevens Street.

The original traffic study submitted with the expanded environmental notification form (EENF) indicated that the unsignalized intersection of the I-291 on- and off-ramps with Page Boulevard will operate at a level of service F under current and Future 2012 Build conditions. The SEIR stated our request to provide revised pavement markings to for acceleration and deceleration lanes at this intersection is not necessary because the existing pavement width provides de facto

acceleration and deceleration lanes. This intersection is included in the traffic monitoring program for the project. Upon occupancy of the site, should the traffic monitoring indicate unsafe conditions at this intersection, the project proponent should implement the requested improvements.

The proponent should coordinate with MassHighway on any modifications (physical or timing) to the traffic signals at Roosevelt Avenue/Page Boulevard, Roosevelt Avenue/Bay Road, and Page Boulevard/I-291 off-ramp. An analysis of conditions in the AM peak period will be necessary to coordinate the new traffic signals along Page Boulevard with the traffic signals at the Roosevelt Avenue/Page Boulevard and the Page Boulevard/I-291 off-ramp intersections. The traffic monitoring plan should also include counts for the AM peak period to help optimize the morning coordination plan for these traffic signals.

The SEIR includes a letter of commitment to reflect mitigation that the project proponent will implement on behalf of this project. The letter will be the basis for MassHighway to issue a Section 61 finding for the project. If you have any questions regarding these comments, please contact Paul Nelson of the Public/Private Development Unit at (617) 973-7479.

3

Air Quality – Greenhouse Gas Emissions Analysis

Introduction

This chapter presents an updated greenhouse gas (GHG) air quality analysis of the Project (including an evaluation of a set of additional and/or refined improvements aimed at further reducing emissions) from the study provided in the February 2008 Expanded Environmental Notification Form (ENF). In addition to the study of mobile and stationary source GHG emissions, the Expanded ENF included an analysis of the ozone precursor emissions (mesoscale) and a localized analysis of mobile source pollutants (microscale). Summaries of those analyses are provided below.

The Secretary's Certificate dated April 11, 2008 requested that the Proponent clarify the GHG emission calculations and documentation and the proposed GHG improvements (those elements controlled by the Proponent and those controlled by future tenants) as well as identify potential additional potential mitigation measures. The purpose of this section is to address the Secretary's Certificate by providing an updated GHG emissions analysis and clarify commitments to specific improvements (i.e., sustainable design measures that directly correlate to the reduction of GHG emissions). Chapter 1, *Project Summary* of this SEIR provides a comprehensive overview of the GHG-related and non-GHG-related sustainable elements proposed as part of the Project.

Summary of Mesoscale Analysis

The Expanded ENF mesoscale analysis evaluated the change in emissions from Project-related traffic for the 2007 Existing, 2012 No-Build, 2012 Build, and 2012 Build with Mitigation conditions. The mesoscale analysis demonstrates that the Project meets the DEP air quality criteria.

Under the Build Condition, the volatile organic compounds (VOC) emissions were estimated to increase by 11.4 kg/day and the oxides of nitrogen (NOx) emissions by 14.3 kg/day from the No-Build Condition. With the recommended transportation mitigation measures, the VOC and NOx emissions are estimated to be reduced by

2.1 kg/day and 0.06 kg/day, respectively, under the 2012 Build Conditions. The analysis of Project-related impacts indicates that with the implementation of improvements, the additional site-generated traffic associated with the Project will not have an adverse impact on the majority of intersection traffic operations. Additionally, the proposed Transportation Demand Management (TDM) program measures are expected to reduce the VOC and NOx emissions associated with the Project, therefore, demonstrating compliance with the transportation conformity criteria (refer to Chapter 2, *Transportation* for further details on the proposed transportation-related mitigation).

Summary of Microscale Analysis

The Expanded ENF microscale analysis evaluated the same conditions as the mesoscale: 2007 Existing, 2012 No-Build, 2012 Build, and 2012 Build with Mitigation. The microscale analysis results showed a reduction in CO concentrations between the 2007 Existing and 2012 No-Build conditions, which can be attributed to more efficient vehicles with enhanced emissions control technologies and the benefits of the Massachusetts Vehicle Inspection and Maintenance program. None of the future No-Build and Build concentrations approaches the CO National Ambient Air Quality Standards (NAAQS) of 35 parts per million (ppm) and 9 ppm for 1-hour or 8-hour, respectively.

The results of the microscale analysis show that the 2012 Build Condition concentrations are the same as or slightly higher than the 2012 No-Build Condition concentrations. The results of the microscale analysis demonstrate that the Project satisfies the State Implementation Plan (SIP) criteria for CO because the 2007 Existing, 2012 No-Build and 2012 Build conditions CO concentrations (both 1- and 8-hour values) are both below the NAAQS criteria.

Summary of Greenhouse Gas Emissions Analysis

In compliance with the *MEPA Greenhouse Gas Emissions Policy and Protocol*, the air quality analysis of the Expanded ENF estimated GHG emissions from mobile and stationary sources for the Project. While GHG emissions include several gases, Carbon Dioxide (CO2) was selected for evaluation because it is the most significant component of project-related GHG emissions.

The mobile source emissions were calculated by performing an annual GHG emissions mesoscale analysis to evaluate the changes in CO2 emissions for the existing and future conditions within the study area. Similar to the mesoscale analysis for ozone (summarized above), the year 2012 was selected as the future year of analysis because MEPA's policy requires that a project look five years into the future from the current year of analysis. The mobile source analysis traffic (volumes,

delays, and speeds) and emission factor data were developed for four conditions: (i) 2007 Existing, (ii) the 2012 No Build, (iii) the 2012 Build, and (iv) the 2012 Build with Improvements.

In addition to mobile sources, direct and indirect CO2 emissions from the Project's proposed building sources were calculated using the computer-based EQUEST model.[1] Direct emissions include those emissions from the facility itself such as boilers, heaters, and internal combustion engines. Indirect emissions include those emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems.

Total Project-related CO2 emissions were determined by combining the CO2 results from the mobile source analysis with the estimated CO2 emissions from the proposed direct and indirect building sources.

Mobile Source CO2 Emissions Results

Currently, 2007 Existing Condition traffic emits 120,663.4 tons per year of CO2. Under the 2012 No-Build Condition, CO2 emissions increase to 130,759.0 tons per year compared to the 2007 Existing Condition. Under the 2012 Build Condition, the Project-related traffic is projected to increase CO2 emissions by 5,801.7 tons per year for a total of 136,560.7 tons per year compared to the 2012 No-Build Condition. However, under the 2012 Build with Improvements Condition, the proposed physical roadway improvements and TDM mitigation measures are projected to reduce CO2 emissions by 593.5 tons per year from the 2012 Build Condition, resulting in 135,967.2 tons per year. This represents an approximately 10 percent reduction in overall Project-related mobile source emissions (see equation below).

The mobile source CO2 emissions percent reduction due to the proposed improvements was calculated in the Expanded ENF as follows:

$$\textit{Reduction \%} = \frac{\textit{(Total Reductions Due to Project Improvements)}}{\textit{2012 Project Emissions}}$$

Therefore, the percent reduction in mobile source emissions due to project improvements is: 593.5/5,801.7 = 0.102 x 100 = 10.2%, or 10% (Table 3-1).

Stationary Source CO2 Emissions Results

Currently, existing buildings emit 884.6 tons per year of CO2. The 2012 Build Condition (meeting minimum building code requirements) is projected to increase CO2 emissions by 3,724.5 for a total of 4609.1 tons per year of CO2. Under the 2012 Build with Improvements Condition, the CO2 emissions were estimated to be 3,373 tons per year – a total reduction of 1,236.1 tons per year compared to the

1 EQUEST (the Quick Energy Simulation Tool), version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA

2012 Build Condition and due to improvements to building design and operation. This represents an approximately 33 percent reduction in overall Project-related stationary source emissions (see equation below).

The stationary source CO2 emissions percent reduction due to the proposed improvements was calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{(Total Reductions Due to Project Improvements)}}{\textit{2012 Project Emissions}}$$

Therefore, the percent reduction in mobile source emissions due to project improvements is: 1,236.1/ 3,724.5 = 0.33 x 100 = 33% (Table 3-2).

Updated Greenhouse Gas Emissions Analysis

As discussed in the Expanded ENF, the Executive Office of Energy and Environmental Affairs (EEA) recently developed and issued a policy that requires project proponents to identify and describe the feasible measures to minimize GHG emissions (the "Policy"). While EPA has not set NAAQS for GHG emissions, they do encourage strategies to reduce emissions and save fuel.

The Policy requires that projects undergoing review by the MEPA Office at the EIR level and meeting specific criteria (e.g., generation of 3,000 or more vehicle trips per day) to quantify the Project's mobile and stationary source GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying Project-related GHG emissions, the Policy also requires proponents to quantify the impact of proposed mitigation in terms of energy savings and emissions. The main goal of the Policy is to ensure that project proponents have carefully considered the GHG impact of their projects and taken all feasible means and measures to reduce those impacts. While every effort should be made to reasonably estimate the emission reductions of potential improvements, the focus of the Policy is not intended to create a numerical GHG emission limit or a numerical GHG emission reduction target, but rather to focus on reducing GHG emissions. While GHG emissions include several gases, Carbon Dioxide (CO2) was selected for evaluation because it is the most significant component of project-related GHG emissions.

Mobile Source Methodology

The GHG mobile source analysis was conducted following procedures similar to the ozone mesoscale analysis (summarized above). The mobile source analysis estimated the area-wide CO2 emissions from vehicle traffic for a time period of one year. The change in CO2 emissions from traffic were based on the average annual traffic volumes, roadway lengths and vehicle emissions factors for existing and new trips

for weekday and weekend conditions. The GHG analysis also calculated the changes in CO2 emissions due to the proposed roadway mitigation measures and TDM measures using the EPA's COMMUTER[2] model Version 2. Mobile source GHG emissions are based upon the traffic volumes, the distance traveled and the GHG emission rate (in grams per vehicle mile traveled). The COMMUTER model evaluates the study area and the Project to identify measures that would reduce or eliminate vehicle trips and GHG emissions.

Mobile Source CO2 Emission Rates

Currently, MOBILE6.2 has a simple estimate of CO2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect on the resulting emissions. The emission rates calculated in this air quality study are adjusted to reflect specific conditions of Massachusetts. A detailed presentation of the MOBILE6.2 input and output data are presented in Appendix C.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mobile source analysis for CO2 emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The detailed traffic analysis was presented in Chapter 3, *Transportation* of the Expanded ENF.

Stationary Source Methodology

The stationary source analysis calculates the Project-related CO2 emissions from building sources (electricity and/or fossil fuels) using the computer-based EQUEST model. These building sources include boilers, heaters and internal combustion engines. Because the Project is in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. To estimate GHG-related impacts, the stationary source analysis compares GHG emissions for two conditions: (i) 2012 Build; and (ii) 2012 Build with Improvements. The 2012 Build Condition represents the stationary source emissions that would occur if the Project were to be built using typical/allowable construction materials and rooftop equipment as prescribed by the Massachusetts Building Code (minimum requirements)[3]. The 2012 Build with Improvements Condition represents the Project-related emissions based

[2] COMMUTER, version 2.0 release from EPA (U.S. Environmental Protection Agency)
[3] Massachusetts Building Code 780 CMR, 6th Edition (2006)

upon the use of improved building materials, electrical systems and/or rooftop equipment.

Existing CO2 Emissions

The calculation of 2007 Existing Condition emissions provides a base for which future years can be evaluated.

Existing Mobile Source CO2 Emissions

The mobile source analysis calculated the 2007 Existing Condition CO2 emissions from the major roadways in the study area. These emissions, estimated to be 120,663.4 tons per year, establish a baseline to which future emissions can be compared. Table 3-1 below presents the existing mobile source CO2 emissions analysis results for existing conditions.

Existing Stationary Source CO2 Emissions

The GHG analysis calculated the 2007 Existing Condition CO2 emissions for direct and indirect emissions from the existing stationary sources, which included several warehouse buildings. Under the 2007 Existing Condition, the CO2 emissions were estimated to be 884.6 tons per year, establishing a baseline to which future emission can be compared (Table 3-2).

Future CO2 Emissions

Future No-Build and Project-related emission estimates are based upon changes in traffic and emission factor data as well as the Project's building sources. The traffic data includes traffic volumes, vehicle-miles-traveled, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The Project's building sources included direct emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following section reports the findings of the mobile source and stationary source (direct and indirect) analyses for the Project.

Future Mobile Source CO2 Emissions

The mobile source analysis estimated the future study area CO2 emissions due to the changes in traffic and emission data. Under the 2012 No-Build Condition, CO2 emissions were estimated to be 130,759.0 tons per year (Table 3-1). The 2012 No-Build Condition CO2 emissions are greater than the 2007 Existing Condition CO2

emissions (120,663.4 tons per year) because the projected 2012 traffic volumes increase as compared to the existing traffic volumes due to growth within the study area.

Under the 2012 Build Condition, the CO2 emissions are estimated to be 136,560.7 tons per year – an increase of 5,801.7 tons per year compared to the 2012 No-Build Condition due to Project-related traffic (Table 3-1). However, under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be approximately 135,967.2 tons per year resulting in a decrease of 593.5 tons per year in CO2 emissions compared to the 2012 Build Condition (Table 3-1). This reduction is due to the proposed physical roadway and signal timing improvements of the study area roadways as well as the TDM Plan (refer to Chapter 2, *Transportation*). This represents an approximately 10 percent reduction in overall Project-related emissions (see equation below).

The mobile source CO2 emissions percent reduction due to improvements was calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{(Total Reductions Due to Project Improvements)}}{\textit{2012 Project Emissions}}$$

Therefore, the percent reduction in mobile source emissions due to project improvements is: 593.5/5,801.7 = 0.102 x 100 = 10.2%, or 10%.

Specific details of these proposed improvements are discussed below in the 'Proposed Project Improvements - Mobile Sources' section as well as in further detail in Chapter 2, *Transportation* of this SEIR.

Table 3-1
Mobile Source CO2 Emissions (tons per year)

2007 Existing Condition	2012 No-Build Condition	2012 Build Condition	2012 Project Emissions	2012 Build w/ Improvements Condition[1]	2012 Reductions Due to Project Improvements[2]	Percent Reduction of Project Improvements to Project Emissions
120,663.4	130,759.0	136,560.7	+5,801.7	135,967.2	-593.5	-10%

Notes:
[1] The proposed improvements are described in the 'Proposed Project Improvements' section n below.
[2] Mobile source improvements include roadway improvements and TDM measures.

The updated analysis herein quantified the mobile source GHG emission reductions related to the proposed TDM measures resulting in an additional reduction of 134.1 tons per year (for a total reduction of 593.5 tons per year) compared to the mobile source reductions presented in Table 4-4 of the Expanded ENF (459.4 tons per year). The quantification of the TDM measures have increased the reduction in

mobile source GHG emissions from an estimated 8 percent in the Expanded ENF to 10 percent in this updated analysis.

Future Stationary Source CO2 Emissions

The Project will generate CO2 emissions thru the use of electricity and fossil fuels. In addition to mobile source CO2 emissions, the GHG analysis herein calculated direct and indirect stationary source CO2 emissions for the 2012 No-Build, 2012 Build and 2012 Build with Improvements conditions. Direct emissions include those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions include those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems.

Under the 2012 No-Build Condition, the CO2 emissions were estimated to be approximately 884.6 tons per year (Table 3-2). This is the same amount of CO2 emissions at the 2007 Existing Condition because it was assumed that there would be no change in the on-site building program or uses where the buildings would be under some level of manufacturing/warehousing operations.

Under the 2012 Build Condition, the stationary source CO2 emissions were estimated to be approximately 4,609.1 tons per year; therefore, the Project results in an increase of 3,724.5 tons per year compared to the 2012 No-Build Condition (Table 3-2). This increase accounts for the elimination of the stationary sources from the existing buildings (884.6 tons per year). Under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 3,531.1 tons per year resulting in a decrease of 1,078.0 tons per year compared to the 2012 Build Condition (Table 3-2). This reduction in stationary source emissions is due to the proposed building and operation improvements (discussed in the 'Proposed Project Improvements: Stationary Sources' section below). This represents an approximately 33 percent reduction in overall Project-related stationary source emissions (see equation below).

The stationary source CO2 emissions percent reduction due to improvements was calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{(Total Reductions Due to Project Improvements)}}{\textit{2012 Project Emissions}}$$

Therefore, the percent reduction in mobile source emissions due to project improvements is: (1,236.1/ 3,724.5 = 0.33 x 100 = 33% (Table 3-2).

Table 3-2 below presents estimated CO2 emissions from direct and indirect stationary sources under all conditions.

Table 3-2
Stationary Source CO2 Emissions (tons per year)

2007 Existing Condition	2012 No-Build Condition	2012 Build Condition[1]	2012 Project Emissions	2012 Build w/ Improvements Condition[2]	2012 Project Improvement Reductions			Percent Reduction of Project Improvements to Project Emissions
					Reductions Due to Project Improvements (On-site)[3]	Reductions Due to Other GHG Programs (Off-site)[4]	Total Reductions	
884.6	884.6	4,609.1	+3,724.5	3,373.0	-1,078.0	-158.1	-1,236.1	-33%

Notes:
[1] 2012 Build Condition meets the minimum requirements of the MA Building Code.
[2] The proposed improvements are described in 'Proposed Project Improvements' section below.
[3] Presents additional reduction of 567.2 tons per year in stationary source CO2 emissions from the Expanded ENF (1,078.0- 510.9 = 567.1 tons per year).
[4] Stationary source emissions account for the refinement of proposed improvements and the addition of the green power purchasing program (an additional reduction of 158.1 tons per year, which is not accounted for in EQUEST).

The Secretary's Certificate on the Expanded ENF requested that the GHG analysis clarify and quantify additional GHG mitigation measures. The Proponent has provided a more refined package of potential stationary source GHG mitigation measures (presented below in sections 'Proposed Project Improvements' and 'Additional Project Improvements' below). The results in Table 3-2 above reflect an additional reduction of 725.2 tons per year (for a total reduction of 1,236.1 tons per year) of direct and indirect stationary source GHG emissions compared to the Expanded ENF (510.9 tons per year). The addition of building and operational GHG improvements has increased the reduction in stationary source GHG emissions from an estimated 14 percent from the Expanded ENF to 33 percent in this updated analysis.

Proposed Project Improvements

The Proponent has proposes both design improvements (roadway and building) and operational energy-efficient measures to be included in the Project. The following section presents those improvements assumed/modeled for the purposes of this analysis.

Mobile Source-Related Improvements

As presented in the Expanded ENF and in Chapter 2, *Transportation* of this SEIR, the Proponent will implement roadway improvements, including modifications to signal phasing and a timing plan to increase capacities and reduce delays of the intersections. Additionally, a TDM Plan will be implemented as part of the Project in an effort to reduce Project-generated vehicle trips and to minimize peak-period traffic demands in the study area. TDM measures include pedestrian, bicycle and public transit facilities for employees and customers as well as possible subsidies for

employees who purchase transit passes to encourage the use of alternative transportation to and from the Project, and possible automatic or on-site services for employees to discourage vehicle trips off-site while working (e.g., direct deposit option for paychecks and/or ATM machines). The implementation of the proposed TDM measures are expected to improve air quality in the study area by increasing the number of persons in a vehicle, and promoting the use of alternative modes of travel. Transportation-related mitigation measures are discussed in more detail in Chapter 2, *Transportation.*

As presented in Chapter 4, *Mitigation and Benefits,* the Proponent has incorporated parking demand management strategies to develop a feasible parking supply and committed to a traffic monitoring program in the future – both of which have indirect benefits to reducing mobile source GHG emissions, but were not able to be quantified for the purposes of this analysis.

Stationary Source-Related Improvements

The Project will result in the elimination of the existing warehouse buildings; therefore, reducing potential GHG emissions from older wasteful systems. The Proponent is committed to implementing all feasible GHG mitigation measures as part of the Project. In addition to adhering to the Policy, the proposed improvements are expected to help reduce future operating costs to some degree.

The following section presents the specific building improvements (and their correlating EQUEST modeling parameters for reference where applicable) that are assumed to be included as part of the Project for the purpose of this analysis. In compliance with the Secretary's Certificate on the Expanded ENF, the Project's GHG emission-related improvements were divided into two key categories: (i) buildings that the Proponent will construct, lease to future tenants and maintain in the future; and (ii) buildings that will be constructed/fit-out and maintained by future tenants. It should be noted that the improvements presented below in A and B are a result of specific potential tenants known at this time. If these tenants are substituted by different tenants at a later date the specific commitments may change. The Policy does recognize that "numerous assumptions" have to be made and that the buildings are at a "relatively conceptual level of design." The proposed buildings are shown in Figure 1.3 in Chapter 1, *Project Summary.*

Proponent Building Improvements

The following is a list of proposed improvements to buildings that the Proponent will construct, lease and maintain:

- High-efficiency Energy Star-compliant packaged HVAC systems (EER =10)
- Heat efficiency = 80 percent
- Install motion sensors in the building in the non-display areas such as bathrooms and offices to reduce energy consumption (Approximately 25 percent reduction of those areas' lighting)

- White colored thermoplastic olefin (TPO) membrane roofing to reduce heat island effect on rooftop
- Double Low-e windows will be installed in order to reduce the total energy consumption for the neighborhood retail and restaurant uses
- Finish the ceilings to improve insulation

Tenant Building Improvements

As stated above, the improvements presented below in A and B are a result of specific potential tenants known at this time. If these tenants are substituted by different tenants at a later date the specific commitments may change.

A. Building that would be constructed and maintained by tenants (Anchor Retail Store A)

- High-efficiency Energy Star-compliant packaged HVAC systems (EER =11.4)
- Heat efficiency = 80 percent
- Install motion sensors in the building in the non-display areas such as bathrooms, stocking area, and offices to reduce energy consumption (Approximately 25 percent reduction of those areas' lighting)
- Install efficient lighting to reduce energy consumption
  - Efficient Lighting will be used in the display areas equal to 0.63 W/sf
  - Efficient Lighting will be used in the interior areas equal to 0.34 W/sf
- White colored thermoplastic olefin (TPO) membrane roofing to reduce heat island effect on rooftop
- Finish the ceilings to improve insulation

B. Building that would be constructed and maintained by tenants (Anchor Retail Store B)

- High-efficiency Energy Star-compliant packaged HVAC systems (EER =10)
- Heat efficiency = 80 percent
- Install motion sensors in the building in the non-display areas such as stocking area to reduce energy consumption (Approximately 25 percent reduction of those areas' lighting)
- Install efficient lighting to reduce energy consumption in sales floor areas by 22 percent
- White colored thermoplastic olefin (TPO) membrane roofing to reduce heat island effect on rooftop
- Finish the ceilings to improve insulation

Additional Project Improvements

The Proponent and its tenants will implement additional energy consumption/GHG-reducing programs that will reduce stationary source GHG emissions. (Please note: some GHG emissions reductions are estimates only as they cannot be modeled as part of EQUEST).

Energy-Star Equipment (Stationary Source Improvement)

The Proponent will install Energy Star equipment (appliances such as refrigerators or microwaves in break rooms and computers at work stations) in the buildings it operates (neighborhood retail and restaurants) and all tenants will be strongly encouraged to do the same. It is not possible at this stage of design to quantify the reduction in GHG emissions of this measure because the number and types of appliances are not known.

Green Power Purchasing Program (Stationary Source Improvement)

One of the potential anchor retail stores for this development has indicated that it will purchase power that is generated from renewable resources such as solar, wind, geothermal, biomass and biogas, as well as low-impact hydropower ("Green Power"). The commitment is for a 35 percent purchase of Green Power for the building. A preliminary estimate of the stationary source GHG emission reductions due to the use of Green Power is an additional approximately 158.1 tons per year. This was accounted for in the total emission reduction estimate above (Table 3-2).

Alternative Project Improvements

MEPA's GHG Policy calls for providing an evaluation of an alternative that may result in greater GHG reductions than the preferred alternative. As demonstrated above, the Proponent and some of the potential tenants are committed to reducing energy demand at the Project where practical and feasible. For the purposes of this alternative analysis, a facility similar in size of the proposed Anchor Retail buildings (A and B) could each potentially utilize a 50 kW solar PV system as a supplemental source of energy. In Massachusetts a 50 kW solar PV installation will generate approximately 61,320 kWh in its first year, or 5,110 kWh per month[4], which equates to approximately 34.4 tons per year in GHG emissions reductions.

The estimated installed cost of the system is $7 to $9 per rated Watt, which gives a cost range of $350,000 to $450,000 for each system. The payback period for the proposed 50kW PV installation for each Anchor Retail building was calculated using the Massachusetts Technology Collaborative "Non-Residential Rebate and Savings Estimator," a financial payback calculator provided through the Commonwealth Solar Initiative[5]. Despite the potential state rebates, such as the Massachusetts Commonwealth Solar Program, or the Federal Investment Tax Credit, the payback period on a solar PV system of this size is estimated to be approximately seven years at best. A more pressing issue regarding the payback period is that the Federal

[4] *A Guide to Solar Electricity for Massachusetts Businesses*, Massachusetts Technology Collaborative: Renewable Energy Trust, February 2008.

[5] The payback calculator used can be found at: http://www.masstech.org/index.asp. Examples of payback calculator inputs/assumptions include: size of installation, cost of system, available rebates scenarios, net capacity/system efficiency, long-term annual operations and maintenance cost, electricity revenue, and inflation rate.

Investment Tax Credit for solar projects is scheduled to expire on December 31, 2008 if Congress does not renew it.[6, 7] Currently, the tax credit is 30 percent of the installed cost of the system; however, it would drop to 10 percent if it is not renewed. If this tax credit were no longer available, the payback period on the proposed system for the Project would more than double to 18-20 years. Where the normal life span of a PV panel is 25 years, an 18-20 year payback is not financially sound given the fact that the system will have to be replaced a few years after it finally achieves its payback.

In conclusion, the PV system was determined to not be feasible or cost-effective at this time because of one or more of the following reasons:

- The technology is not advanced enough to be cost-effective for the proposed building type;
- From a business standpoint, the alternative is cost-prohibitive for a project of this scale, due to the projected rate of return; and
- Due to the unpredictability associated with the government incentives (in particular, the Federal Investment Tax Credit).

Conclusion

The air quality study demonstrates that the Project complies with the Clean Air Act Amendments (CAAA), the State Implementation Plan (SIP), and the GHG policy. The GHG emissions analysis demonstrates that the Project complies with the GHG policy because the Proponent has quantified potential Project-related emissions and committed to reasonable mobile and stationary source improvements that are estimated to reduce the GHG emissions from levels expected from the Project without improvements.

The air quality study demonstrates that the Project conforms to the CAAA, the SIP, and GHG policy because:

- It has modeled and quantified all Project-related impacts in accordance with DEP guidelines (for mesoscale) and the *MEPA Greenhouse Gas Policy and Protocol* (for GHG);
- It will implement reasonable and feasible ozone precursor and CO2 reduction mitigation measures;
- No new violation or delay in attainment of the NAAQS will result; and
- No increase in the frequency or severity of any existing violations will occur.

[6] Congress has failed to pass the Federal Investment Tax Credit for solar (S. 3335) eight times so far.
[7] Any project that is not installed and operative by December 31, 2008 will not be eligible to receive the tax credit.

Stationary Source Results – CO2 Emissions

CO2 Conversion Factors

Electricity	**1107** lb CO2/Mwh	ISO-New Elgnad Marginal Emissions Report	
Gas	**117.08** lb CO2/Mbtu	The Energy Information Administration Documentation for Emissio	136 lb CO2/Mbtu

Coverage	City	Analysis Year	Building Location
MA	Springfield	2012	Springfield, MA

	File Name	Building Area	No. of Building
Build Conditions	Springfield_2012CodeCompliant_RetailA	20,000	1
	Springfield_2012CodeCompliant_Retail B/C	60,000	1
2012	Springfield_2012CodeCompliant_Anchor Retail A	90,000	1
	Springfield_2012CodeCompliant_RetailD	40,000	1
	Springfield_2012CodeCompliant_RetailE	30,000	1
	Springfield_2012CodeCompliant_Retail F	3,200	1
	Springfield_2012CodeCompliant_Neighborhood Retail	47,000	1
	Springfield_2012CodeCompliant_Anchor Retail B	134,000	1
	Springfield_2012CodeCompliant_Restaurant A	6,500	1
	Springfield_2012CodeCompliant_Restaurant B	6,500	1
		437,200	

Total Elec. (Mwh)	CO2 from electricity (lbs)	CO2 from electricity s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	CO2 from gas s (tons)	TOTAL CO2 (tons)
336.55	372,560.85	186.28	858.35	100,495.62	50.25	**236.53**
1,002.40	1,109,656.80	554.83	2,230.80	261,182.06	130.59	**685.42**
1,501.60	1,662,271.20	831.14	3,226.90	377,805.45	188.90	**1,020.04**
669.37	740,992.59	370.50	1,554.30	181,977.44	90.99	**461.49**
502.82	556,621.74	278.31	1,208.80	141,526.30	70.76	**349.07**
34.55	38,246.85	19.12	119.68	14,012.13	7.01	**26.13**
785.94	870,035.58	435.02	1,792.90	209,912.73	104.96	**539.97**
2,031.70	2,249,091.90	1,124.55	7.00	819.56	0.41	**1,124.96**
80.66	89,290.62	44.65	650.74	76,188.64	38.09	**82.74**
80.66	89,290.62	44.65	650.74	76,188.64	38.09	**82.74**
						4,609.08

	File Name	Building Area	No. of Building
Build Conditions w. Improvements	Springfield_2012Buildwithimprovements_RetailA	20,000	1
	Springfield_2012Buildwithimprovements_Retail B/C	60,000	1
2012	Springfield_2012Buildwithimprovements_Anchor Retail A	90,000	1
	Springfield_2012Buildwithimprovements_RetailD	40,000	1
	Springfield_2012Buildwithimprovements_RetailE	30,000	1
	Springfield_2012Buildwithimprovements_Retail F	3,200	1
	Springfield_2012Buildwithimprovements_Neighborhood Retail	47,000	1
	Springfield_2012Buildwithimprovements_Anchor Retail B	134,000	1
	Springfield_2012Buildwithimprovements_Restaurant A	6,500	1
	Springfield_2012Buildwithimprovements_Restaurant B	6,500	1
		437,200	

Total Elec. (Mwh)	CO2 from electricity (lbs)	CO2 from electricity s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	CO2 from gas s (tons)	TOTAL CO2 (tons)
261.52	289,502.64	144.75	619.89	72,576.72	36.29	**181.04**
633.93	701,760.51	350.88	1,310.30	153,409.92	76.70	**427.59**
816.12	903,444.84	451.72	3,918.80	458,813.10	229.41	**681.13**
527.27	583,687.89	291.84	1,124.10	131,609.63	65.80	**357.65**
367.84	407,198.88	203.60	837.51	98,055.67	49.03	**252.63**
28.64	31,704.48	15.85	95.86	11,223.29	5.61	**21.46**
470.98	521,374.86	260.69	1,114.30	130,462.24	65.23	**325.92**
2,052.50	2,272,117.50	1,136.06	4.33	506.96	0.25	**1,136.31**
120.50	133,393.50	66.70	117.32	13,735.83	6.87	**73.56**
120.90	133,836.30	66.92	117.51	13,758.07	6.88	**73.80**
						3,531.09

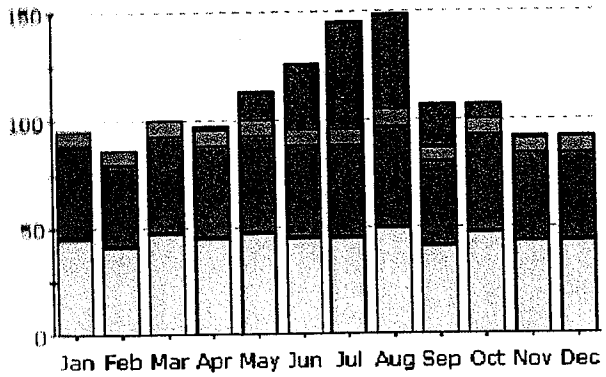
Conversion Factors

Multiply	By	To Obtain	
Mwh	1107	lbs	**(For Electricity)**
Mbtu	117.08	lbs	**(For Gas)**
lbs	0.0005	tons	

E-Quest Results

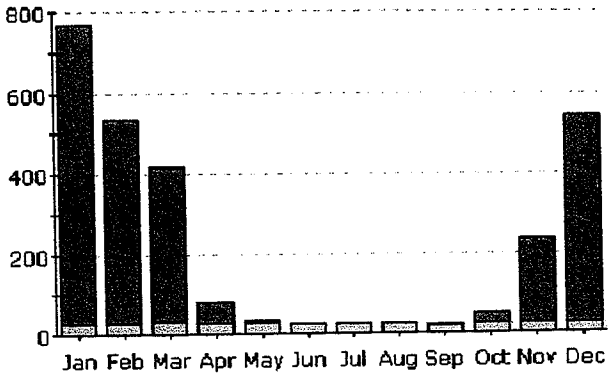
Electric Consumption (kWh)

(x000)



Gas Consumption (Btu)

(x000,000)

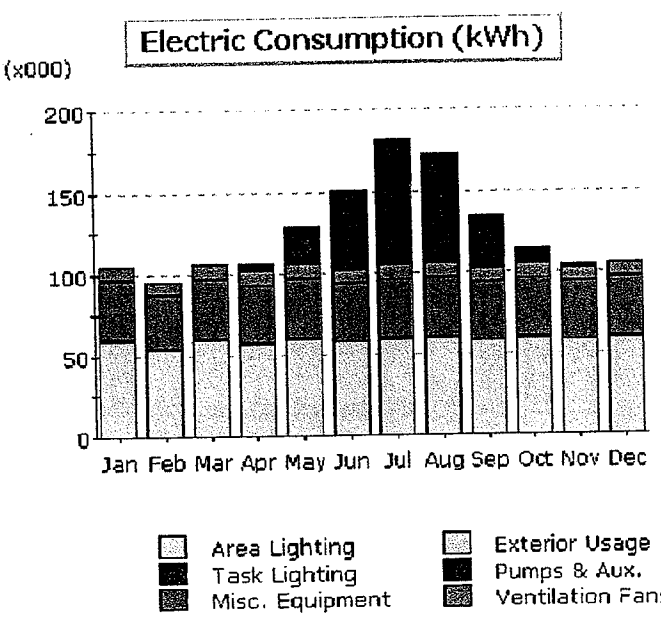


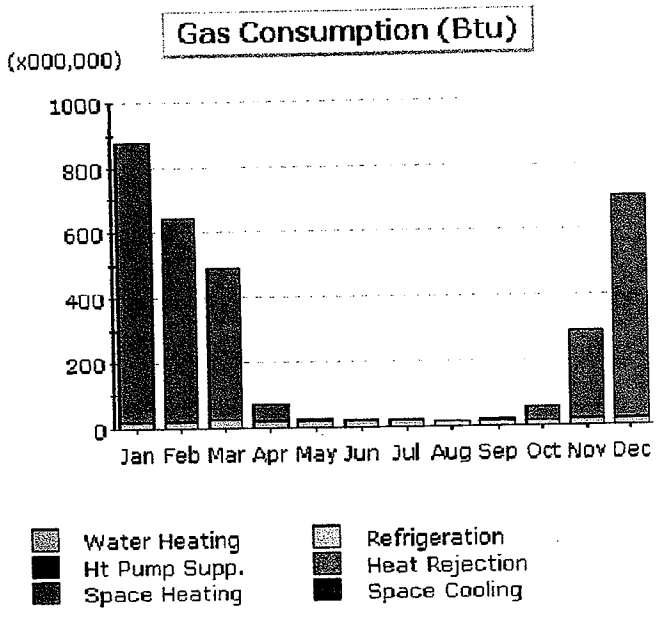
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	1.7	12.8	30.5	49.3	44.1	19.7	6.9	0.2	-	165.2
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.4	6.7	7.8	7.4	7.8	7.4	7.4	8.2	6.7	7.8	7.1	7.1	89.0
Pumps & Aux.	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.2
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	42.4	38.4	44.3	42.3	44.3	42.3	42.4	46.1	38.7	44.3	40.5	40.6	506.5
Task Lights	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.7	0.8	0.7	0.7	9.3
Area Lights	44.9	40.7	47.1	44.9	47.1	44.9	44.9	49.2	40.7	47.1	42.8	42.8	537.2
Total	95.6	86.5	100.0	97.2	112.7	126.0	144.9	148.4	106.5	106.8	91.4	91.3	1,307.4

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	737.2	504.1	386.3	52.4	2.4	-	-	-	-	25.7	209.3	516.4	2,433.9
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	29.3	27.5	31.8	29.7	28.8	25.3	23.4	24.2	20.2	24.3	24.1	26.2	314.9
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	766.6	531.6	418.1	82.2	31.2	25.3	23.4	24.2	20.2	50.0	233.3	542.6	2,748.8



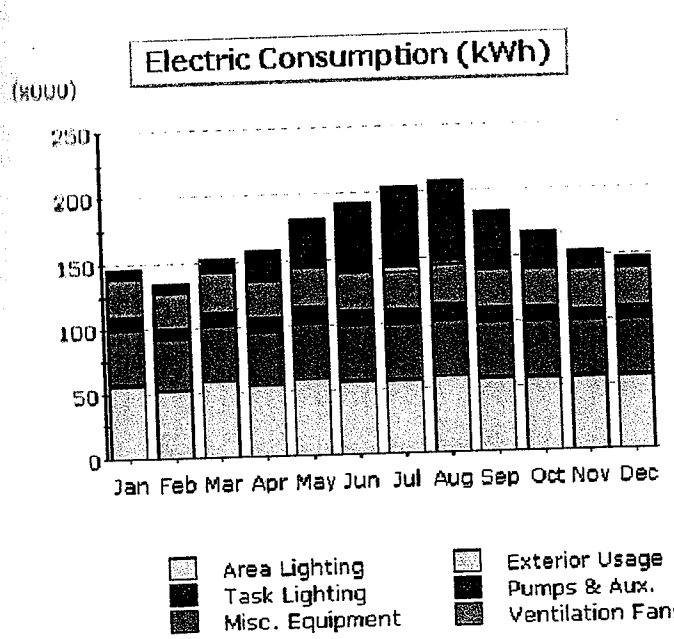


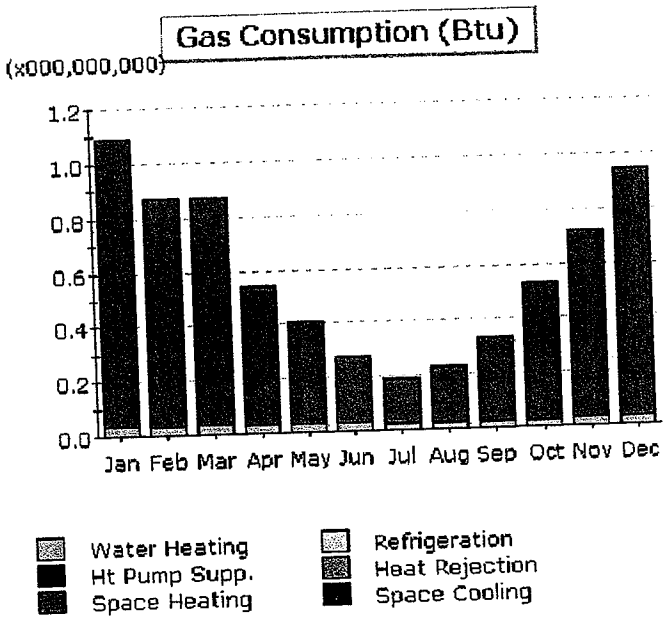
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	4.4	22.4	48.5	76.4	66.7	31.8	9.0	1.4	-	260.7
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	8.7	7.9	8.7	8.4	8.7	8.5	8.7	8.7	8.5	8.7	8.5	8.7	102.6
Pumps & Aux.	0.2	0.2	0.2	0.1	0.0	0.0	-	0.0	0.0	0.1	0.1	0.2	1.1
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	37.2	33.7	37.3	35.9	37.3	36.1	37.2	37.3	36.1	37.2	36.1	37.2	438.6
Task Lights	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	4.1
Area Lights	58.8	53.3	59.2	56.9	59.2	57.2	58.8	59.2	57.2	58.8	57.2	58.8	694.5
Total	105.2	95.3	105.8	106.0	128.0	150.7	181.4	172.3	133.9	114.2	103.6	105.2	1,501.6

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	859.1	619.7	466.1	49.3	5.5	-	-	0.1	2.4	35.6	271.6	682.8	2,992.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.0	20.8	23.1	21.7	20.9	18.6	17.7	16.9	16.3	17.5	18.4	20.6	234.7
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	881.1	640.4	489.2	71.0	26.5	18.6	17.7	17.0	18.7	53.1	290.0	703.4	3,226.9



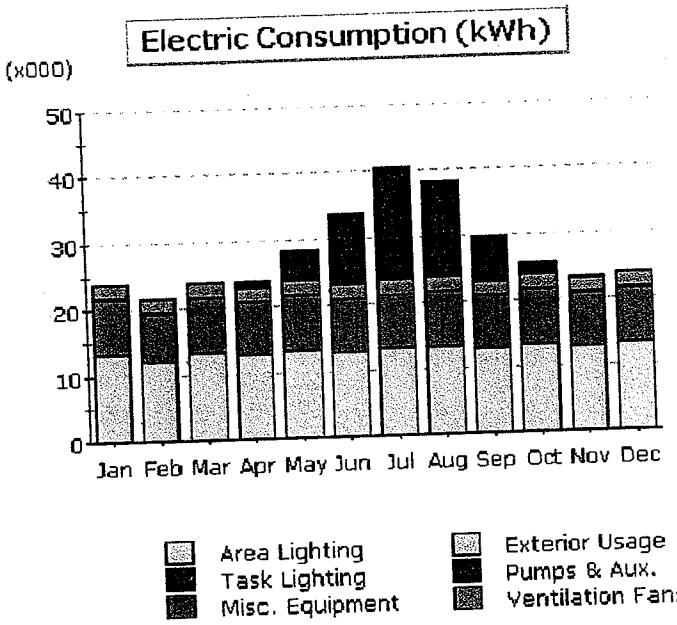


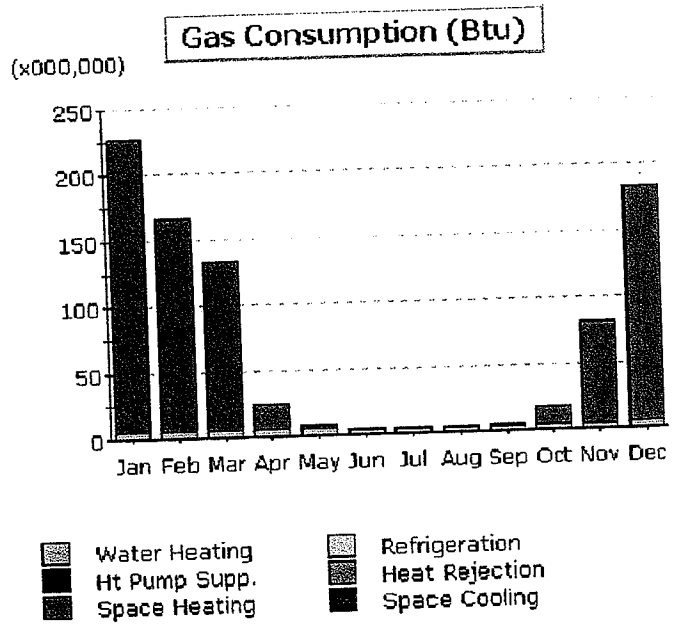
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	8.6	7.9	10.4	23.9	36.7	51.4	61.9	60.7	43.9	27.8	14.4	9.4	357.0
Heat Reject.	-	-	-	0.1	0.7	1.9	2.9	2.7	1.3	0.5	0.1	-	10.1
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	29.3	27.1	30.4	28.2	30.4	29.3	29.3	30.4	29.3	29.3	29.3	29.3	351.7
Pumps & Aux.	9.4	8.7	10.0	10.7	11.9	11.7	11.7	12.1	11.6	11.1	10.0	9.5	128.4
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	42.4	38.8	43.3	40.8	43.3	41.8	42.4	43.3	41.8	42.4	41.8	42.4	504.5
Task Lights	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	3.7
Area Lights	56.4	52.0	58.5	54.3	58.5	56.3	56.4	58.5	56.3	56.4	56.3	56.4	676.3
Total	146.4	134.7	152.9	158.3	181.9	192.7	204.9	208.1	184.6	167.7	152.2	147.4	2,031.7

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.06	0.84	0.83	0.51	0.38	0.24	0.16	0.20	0.31	0.50	0.69	0.91	6.63
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.36
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.09	0.87	0.87	0.54	0.41	0.27	0.19	0.23	0.34	0.53	0.72	0.94	7.00



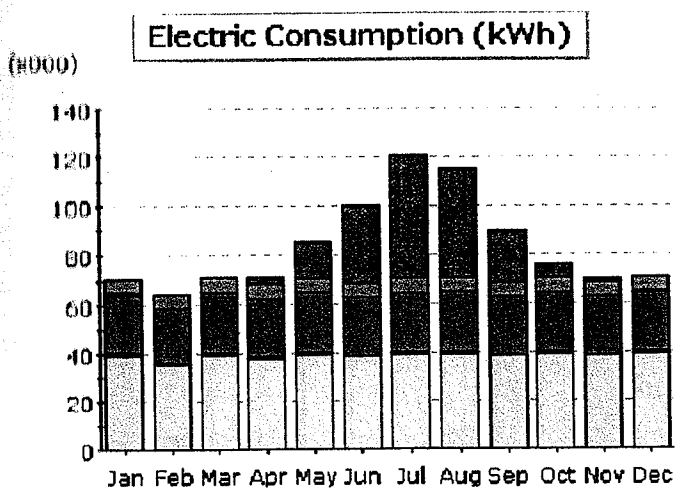


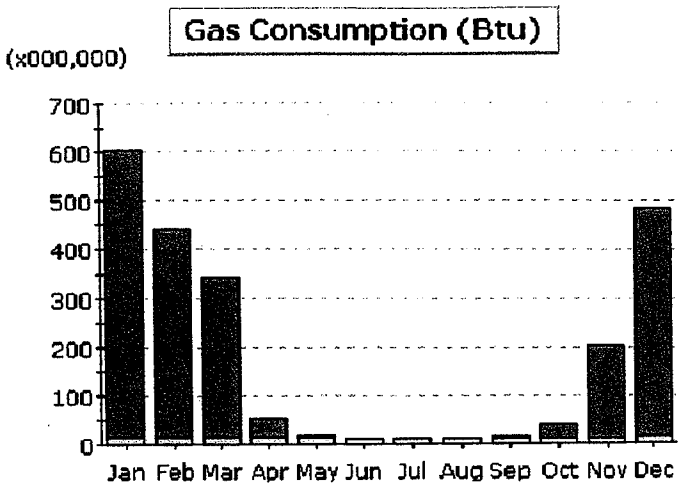
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.80	4.55	10.69	17.05	14.55	6.69	1.68	0.29	-	56.31
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.24	2.02	2.24	2.16	2.24	2.17	2.23	2.24	2.16	2.24	2.17	2.23	26.33
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	8.30	7.48	8.30	7.99	8.30	8.03	8.26	8.30	7.99	8.30	8.03	8.26	97.54
Task Lights	0.08	0.07	0.08	0.07	0.08	0.07	0.08	0.08	0.07	0.08	0.07	0.08	0.91
Area Lights	13.15	11.84	13.15	12.64	13.15	12.71	13.07	13.15	12.64	13.15	12.71	13.07	154.41
Total	23.95	21.58	23.94	23.73	28.35	33.68	40.69	38.32	29.57	25.52	23.40	23.82	336.55

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	222.22	162.26	128.61	19.32	2.92	-	-	-	1.64	13.59	76.97	178.62	806.15
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	4.93	4.61	5.13	4.83	4.65	4.14	3.94	3.76	3.60	3.92	4.10	4.57	52.20
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	227.14	166.87	133.74	24.15	7.58	4.14	3.94	3.76	5.25	17.51	81.07	183.19	858.35



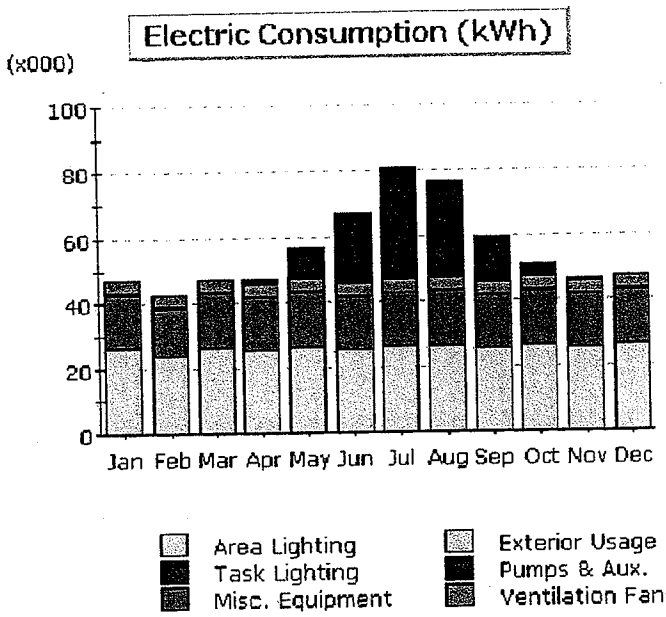


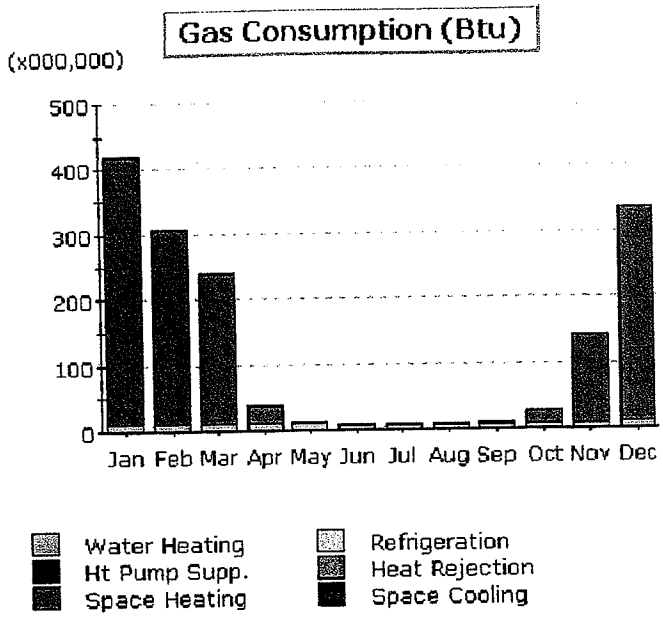
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	2.8	14.6	32.2	50.9	44.2	21.0	5.8	0.9	-	172.4
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	6.0	5.4	6.0	5.8	6.0	5.8	6.0	6.0	5.8	6.0	5.8	6.0	70.7
Pumps & Aux.	0.2	0.2	0.2	0.1	0.0	0.0	-	0.0	0.0	0.1	0.1	0.2	1.1
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	24.8	22.4	24.9	24.0	24.9	24.1	24.8	24.9	24.1	24.8	24.1	24.8	292.4
Task Lights	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2.7
Area Lights	39.2	35.5	39.4	37.9	39.4	38.1	39.2	39.4	38.1	39.2	38.1	39.2	463.1
Total	70.4	63.8	70.8	70.7	85.2	100.4	121.1	114.8	89.3	76.1	69.3	70.4	1,002.4

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	590.3	427.6	325.3	37.3	4.7	-	-	-	2.1	26.5	190.3	470.3	2,074.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	14.7	13.8	15.4	14.5	14.0	12.4	11.8	11.3	10.9	11.7	12.3	13.7	156.5
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	605.0	441.4	340.7	51.8	18.6	12.4	11.8	11.3	13.0	38.2	202.6	484.0	2,230.8



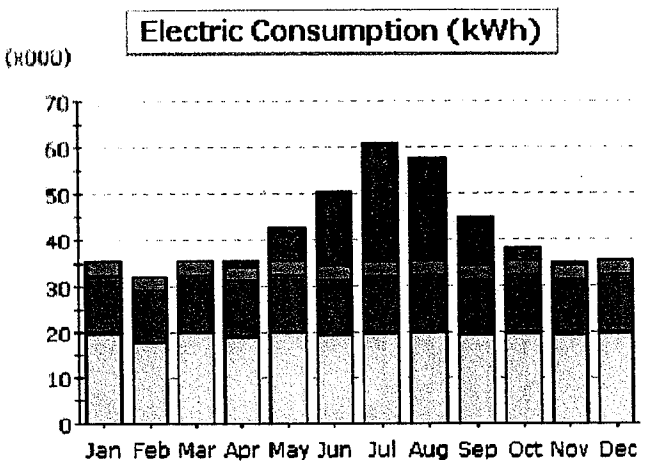


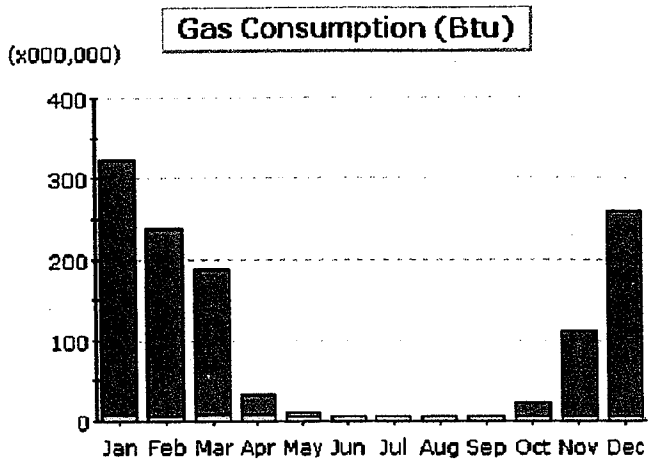
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	1.74	9.53	21.34	33.96	29.31	13.82	3.72	0.59	-	114.01
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.13	3.74	4.15	3.99	4.15	4.02	4.13	4.15	4.02	4.13	4.02	4.13	48.78
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	16.52	14.96	16.60	15.98	16.60	16.05	16.52	16.60	16.05	16.52	16.05	16.52	194.99
Task Lights	0.15	0.14	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	1.82
Area Lights	26.15	23.69	26.29	25.28	26.29	25.43	26.15	26.29	25.43	26.15	25.43	26.15	308.71
Total	47.14	42.71	47.38	47.22	56.76	66.99	80.91	76.52	59.49	50.75	46.38	47.13	669.37

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	408.3	296.9	228.8	28.9	3.8	-	-	-	1.7	20.3	135.0	326.3	1,449.9
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	9.8	9.2	10.3	9.7	9.3	8.3	7.9	7.5	7.3	7.8	8.2	9.1	104.3
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	418.1	306.2	239.0	38.6	13.1	8.3	7.9	7.5	8.9	28.1	143.2	335.4	1,554.1



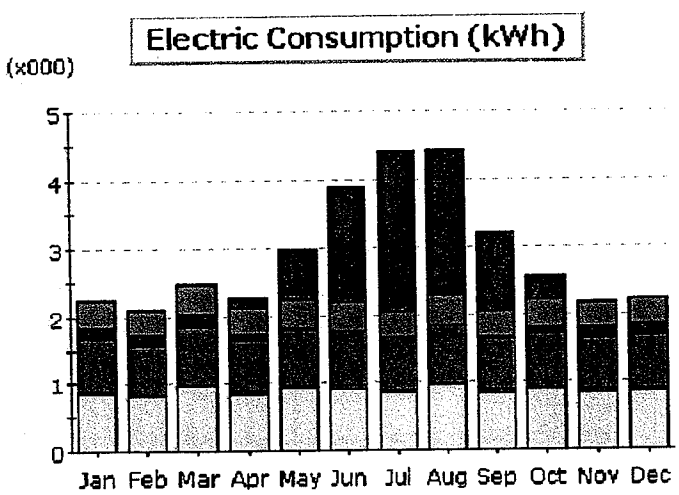


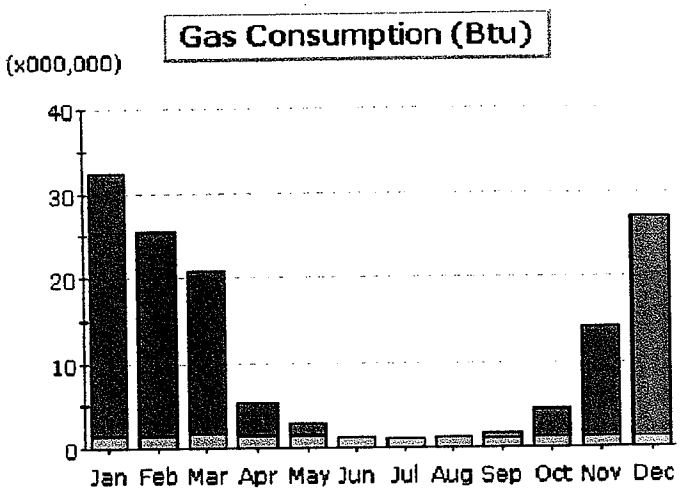
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	1.23	7.00	15.98	25.48	21.91	10.28	2.64	0.43	-	84.96
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	3.19	2.89	3.21	3.08	3.21	3.10	3.19	3.21	3.10	3.19	3.10	3.19	37.65
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	12.39	11.22	12.45	11.98	12.45	12.04	12.39	12.45	12.04	12.39	12.04	12.39	146.25
Task Lights	0.12	0.10	0.12	0.11	0.12	0.11	0.12	0.12	0.11	0.12	0.11	0.12	1.36
Area Lights	19.61	17.77	19.72	18.96	19.72	19.07	19.61	19.72	19.07	19.61	19.07	19.61	231.54
Total	35.49	32.15	35.67	35.45	42.53	50.31	60.78	57.41	44.62	38.03	34.89	35.49	502.82

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	315.5	230.5	179.1	24.5	3.4	-	-	-	1.5	16.8	106.4	252.9	1,130.6
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	7.3	6.9	7.7	7.3	7.0	6.2	5.9	5.6	5.4	5.8	6.2	6.9	78.3
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	322.8	237.4	186.8	31.7	10.3	6.2	5.9	5.6	6.9	22.7	112.5	259.8	1,208.8



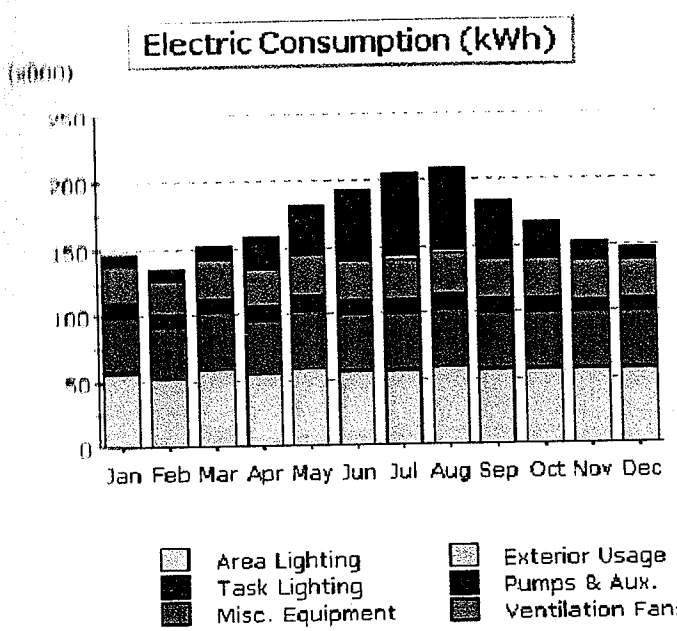


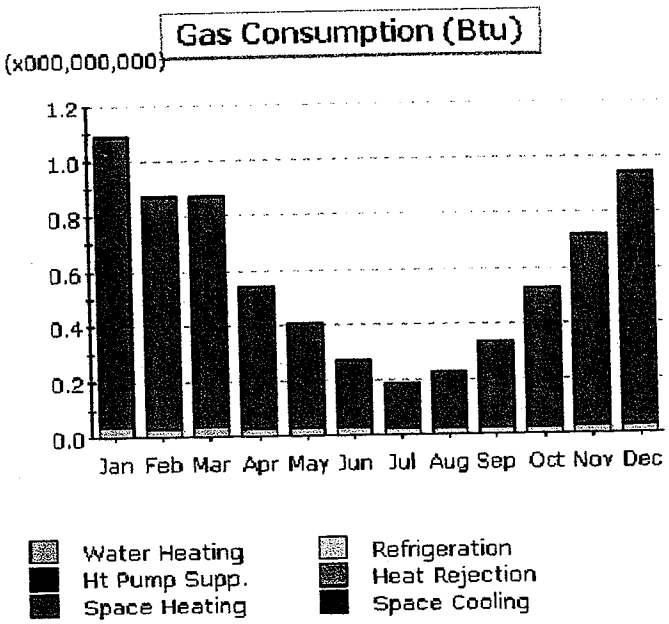
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.14	0.69	1.60	2.24	2.03	1.13	0.33	-	-	8.16
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.39	0.37	0.45	0.39	0.43	0.43	0.39	0.45	0.39	0.41	0.39	0.39	4.87
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.78	0.73	0.85	0.77	0.83	0.82	0.78	0.85	0.77	0.81	0.77	0.78	9.55
Task Lights	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.39
Area Lights	0.85	0.80	0.96	0.84	0.92	0.92	0.85	0.96	0.84	0.88	0.84	0.85	10.52
Total	2.24	2.10	2.47	2.26	2.94	3.81	4.29	4.33	3.18	2.54	2.17	2.23	34.55

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	27.42	21.03	16.48	2.81	0.85	0.00	-	-	0.30	2.32	10.71	22.65	104.59
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.36	1.33	1.60	1.37	1.38	1.26	1.07	1.16	1.02	1.12	1.16	1.27	15.10
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	28.78	22.36	18.08	4.18	2.24	1.27	1.07	1.16	1.32	3.45	11.87	23.92	119.68



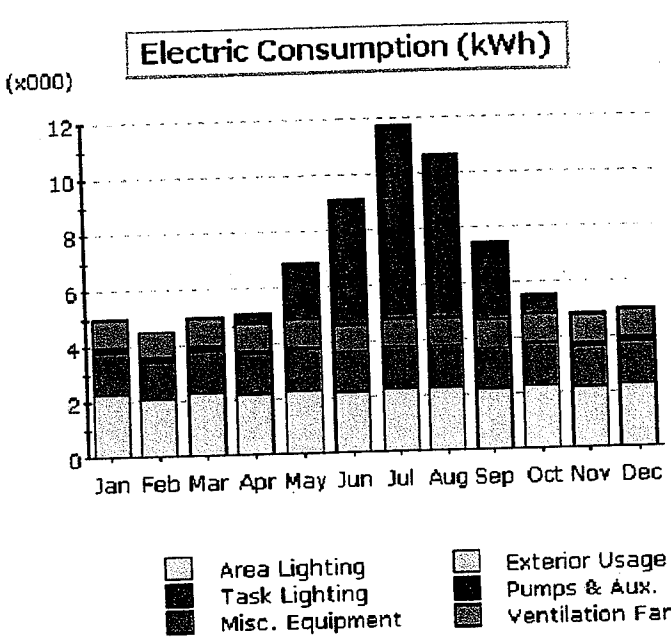


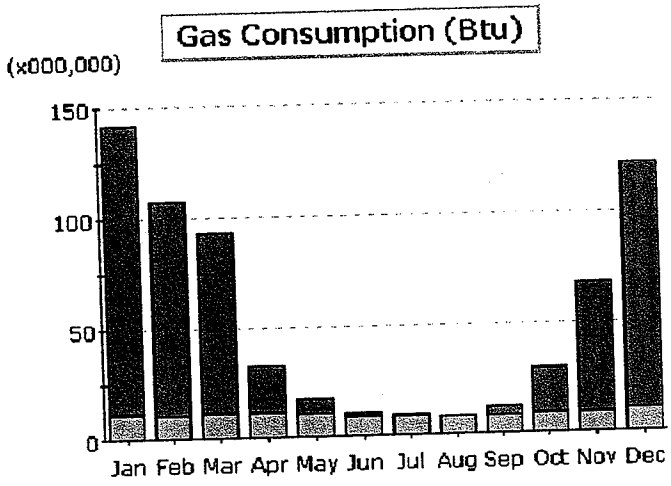
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	2.07	11.24	25.09	39.92	34.59	16.29	4.48	0.70	-	134.38
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	4.79	4.34	4.81	4.63	4.81	4.65	4.79	4.81	4.65	4.79	4.65	4.79	56.51
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	19.41	17.58	19.50	18.77	19.50	18.86	19.41	19.50	18.86	19.41	18.86	19.41	229.11
Task Lights	0.18	0.16	0.18	0.17	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	2.14
Area Lights	30.72	27.84	30.90	29.70	30.90	29.88	30.72	30.90	29.88	30.72	29.88	30.72	362.75
Total	55.29	50.09	55.57	55.42	66.67	78.66	95.02	89.99	69.88	59.67	54.41	55.28	785.94

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	472.4	343.1	263.0	32.0	4.1	-	-	-	1.8	22.5	154.5	377.0	1,670.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.5	10.8	12.1	11.4	10.9	9.7	9.3	8.8	8.5	9.2	9.6	10.7	122.6
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	483.9	353.9	275.0	43.3	15.0	9.7	9.3	8.8	10.4	31.7	164.1	387.7	1,792.9



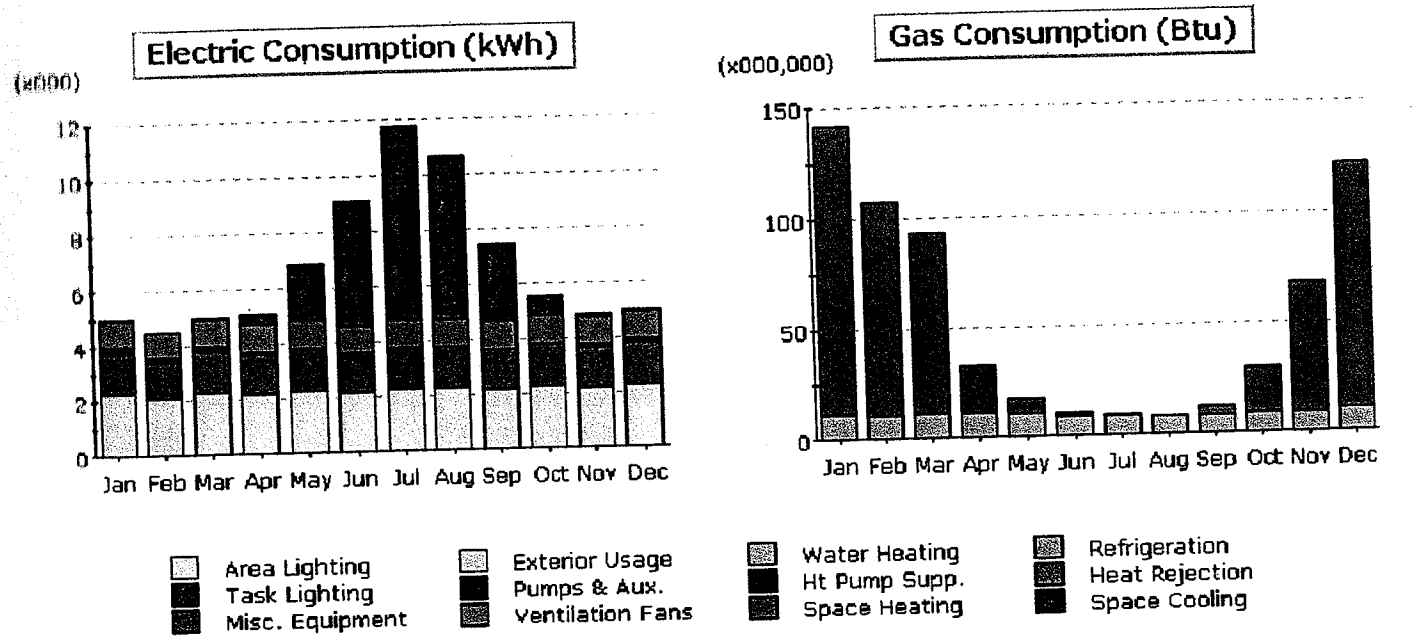


Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.37	2.00	4.43	7.00	5.90	2.79	0.67	0.08	-	23.23
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.02	0.92	1.02	0.99	1.02	0.99	1.02	1.02	0.99	1.02	0.99	1.02	12.04
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.50	1.36	1.50	1.45	1.50	1.45	1.50	1.50	1.45	1.50	1.45	1.50	17.60
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	2.26	2.04	2.26	2.19	2.26	2.19	2.26	2.26	2.19	2.26	2.19	2.26	26.65
Total	4.97	4.49	4.96	5.08	6.82	9.06	11.78	10.69	7.44	5.54	4.85	4.97	80.66

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	130.19	96.75	81.49	21.37	6.84	1.14	0.01	0.02	3.67	20.60	58.76	111.51	532.36
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.17	10.47	11.62	11.00	10.51	9.36	8.94	8.50	8.21	8.88	9.30	10.43	118.39
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	141.36	107.22	93.10	32.37	17.35	10.50	8.95	8.51	11.88	29.48	68.06	121.94	650.74

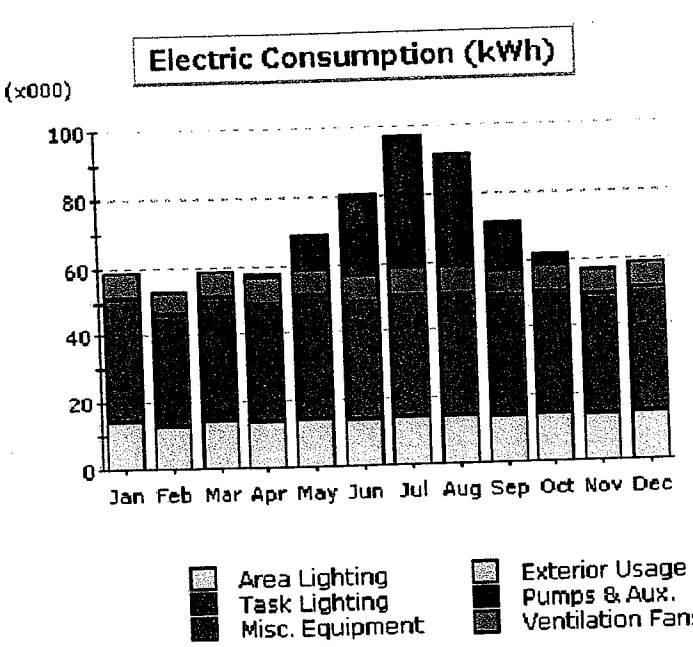


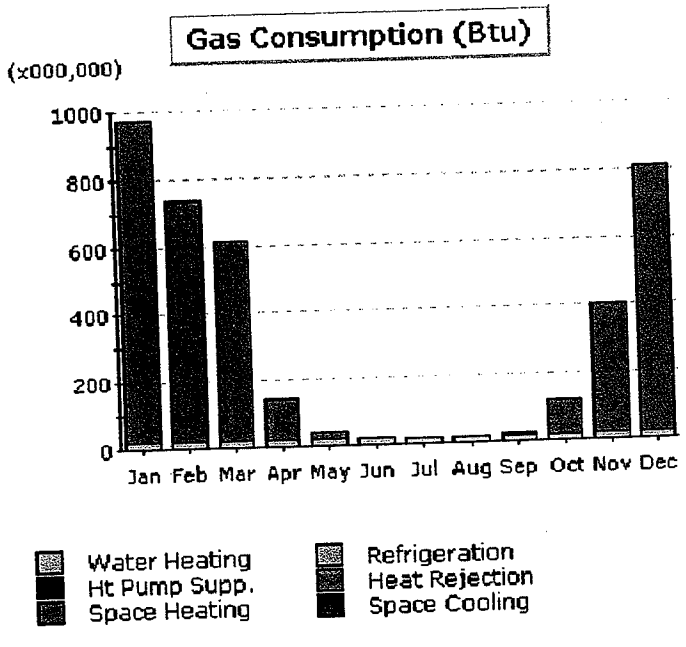
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.37	2.00	4.43	7.00	5.90	2.79	0.67	0.08	-	23.23
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.02	0.92	1.02	0.99	1.02	0.99	1.02	1.02	0.99	1.02	0.99	1.02	12.04
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	1.50	1.36	1.50	1.45	1.50	1.45	1.50	1.50	1.45	1.50	1.45	1.50	17.68
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	2.26	2.04	2.26	2.19	2.26	2.19	2.26	2.26	2.19	2.26	2.19	2.26	26.65
Total	4.97	4.49	4.96	5.08	6.82	9.06	11.78	10.69	7.44	5.54	4.85	4.97	80.66

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	130.19	96.75	81.49	21.37	6.84	1.14	0.01	0.02	3.67	20.60	58.76	111.51	532.35
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	11.17	10.47	11.62	11.00	10.51	9.36	8.94	8.50	8.21	8.88	9.30	10.43	118.39
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	141.36	107.22	93.10	32.37	17.35	10.50	8.95	8.51	11.88	29.48	68.06	121.94	650.74





Electric Consumption (kWh x000)

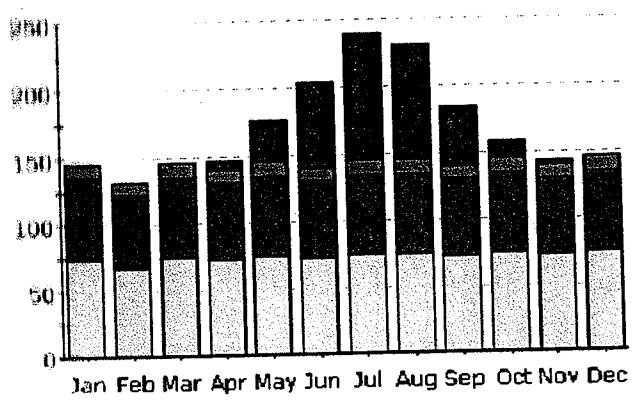
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	1.23	10.10	23.75	39.13	33.00	14.56	3.33	0.55	-	125.65
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.50	6.79	7.52	7.24	7.52	7.27	7.50	7.50	7.30	7.48	7.27	7.52	88.41
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	36.41	32.95	36.47	35.18	36.47	35.30	36.41	36.41	35.42	36.35	35.30	36.47	429.14
Task Lights	0.33	0.30	0.33	0.32	0.33	0.32	0.33	0.33	0.32	0.33	0.32	0.33	3.89
Area Lights	14.25	12.90	14.28	13.76	14.28	13.82	14.25	14.25	13.88	14.22	13.82	14.28	167.97
Total	58.68	53.10	58.77	57.81	68.73	80.46	97.62	91.49	71.50	61.79	57.39	58.78	816.12

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	949.2	712.1	590.2	122.4	21.7	-	-	-	10.5	103.8	381.7	788.4	3,680.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.4	21.1	23.4	22.1	21.2	18.9	18.1	17.1	16.7	17.8	18.7	21.0	230.7
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	971.7	733.2	613.7	144.6	43.0	18.9	18.1	17.1	27.1	121.7	400.4	809.4	3,910.8

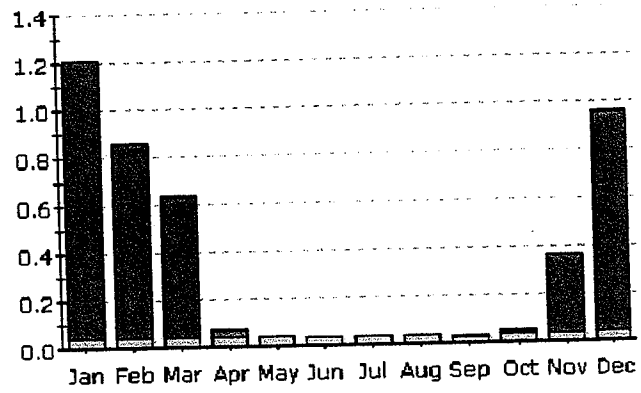
Electric Consumption (kWh)

(x000)



Gas Consumption (Btu)

(x000,000,000)



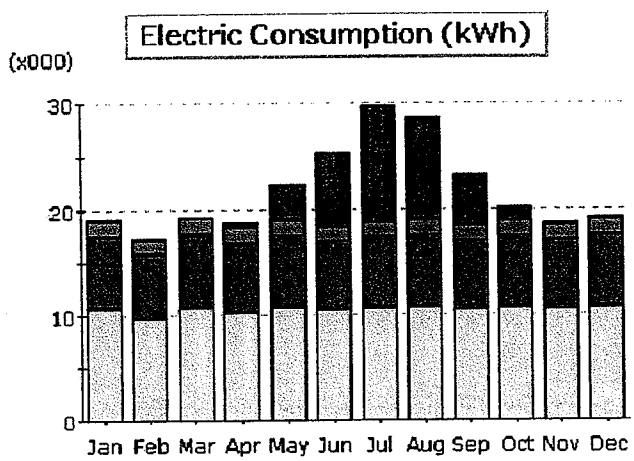
Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

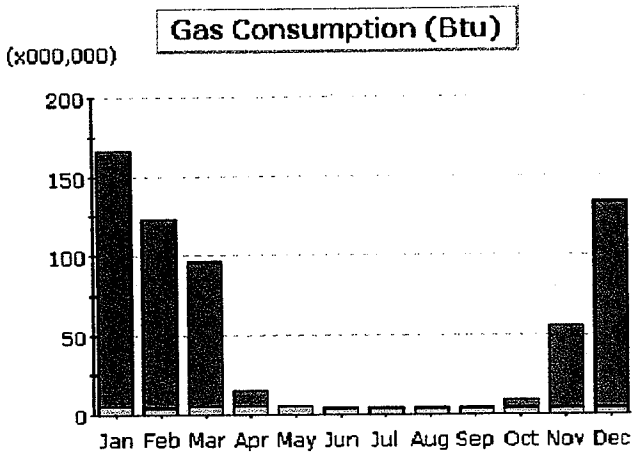
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	6.2	30.2	62.6	94.9	84.3	43.0	13.0	2.1	-	336.3
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	11.3	10.2	11.4	11.0	11.3	11.0	11.3	11.4	11.0	11.3	11.0	11.3	133.5
Pumps & Aux.	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.2
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	59.4	53.8	59.7	57.6	59.6	57.7	59.5	59.7	57.6	59.5	57.5	59.5	701.1
Task Lights	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5.9
Area Lights	74.1	67.1	74.6	72.0	74.4	72.1	74.3	74.6	72.0	74.3	71.8	74.3	875.5
Total	145.3	131.6	146.1	147.3	176.0	204.0	240.5	230.4	184.1	158.6	143.0	145.6	2,052.5

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.17	0.82	0.59	0.03	0.00	-	-	0.00	-	0.02	0.33	0.92	3.87
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.04	0.04	0.46
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.21	0.86	0.63	0.07	0.04	0.04	0.03	0.03	0.03	0.05	0.37	0.96	4.33



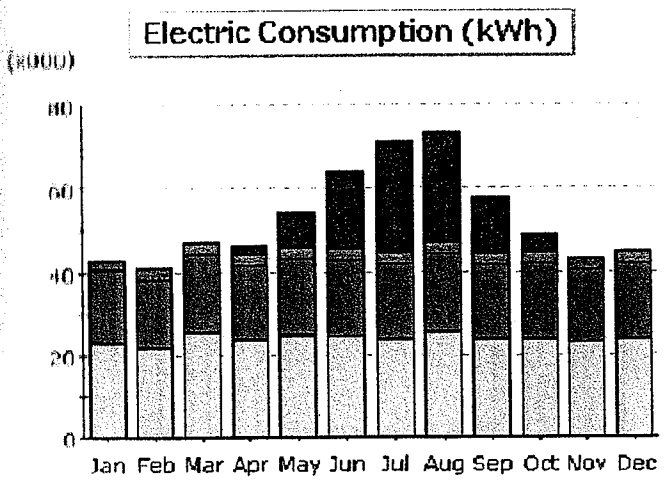


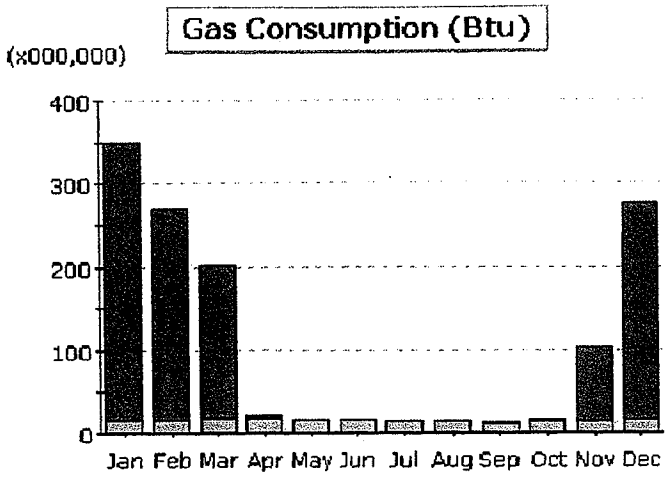
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.53	3.20	6.98	10.91	9.62	4.70	1.29	0.18	-	37.41
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.50	1.36	1.51	1.45	1.51	1.46	1.50	1.51	1.46	1.50	1.46	1.50	17.70
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	6.64	6.02	6.69	6.41	6.69	6.46	6.64	6.69	6.46	6.64	6.46	6.64	78.44
Task Lights	0.06	0.05	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.67
Area Lights	10.67	9.69	10.78	10.31	10.78	10.41	10.67	10.78	10.41	10.67	10.41	10.67	126.24
Total	19.04	17.29	19.20	18.83	22.27	25.38	29.77	28.65	23.12	20.22	18.71	19.04	261.52

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	161.98	118.50	91.12	10.39	0.86	-	-	-	0.17	4.97	51.62	129.18	568.79
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	4.79	4.52	5.04	4.72	4.57	4.06	3.85	3.69	3.56	3.81	4.02	4.47	51.10
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	166.77	123.02	96.17	15.11	5.42	4.06	3.85	3.69	3.73	8.78	55.64	133.66	619.89



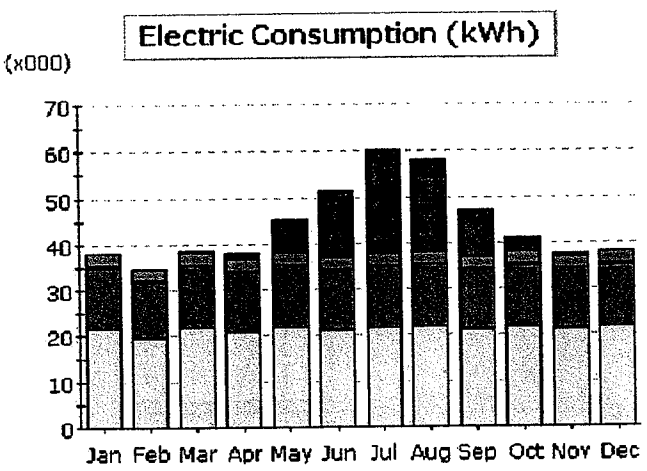


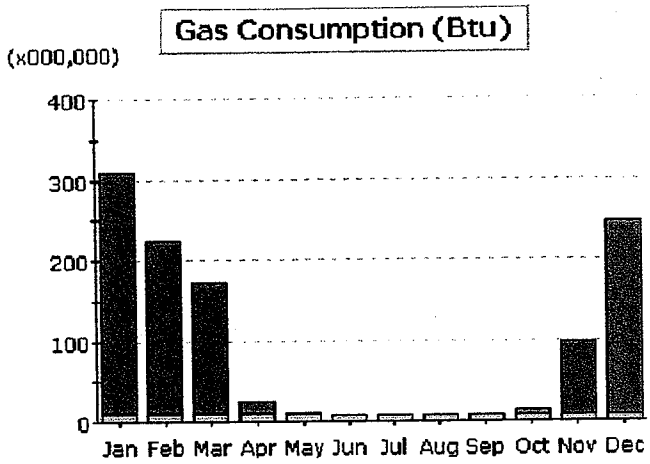
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	1.93	8.63	18.41	26.62	25.64	13.34	3.99	0.29	-	98.84
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.67	2.56	3.01	2.79	2.90	2.90	2.79	3.01	2.79	2.79	2.67	2.79	33.65
Pumps & Aux.	0.04	0.03	0.03	0.02	0.01	0.00	-	0.00	0.00	0.02	0.03	0.04	0.21
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	17.68	16.46	18.80	17.77	18.43	18.15	18.05	18.80	17.77	18.05	17.40	18.05	215.42
Task Lights	0.11	0.10	0.12	0.11	0.12	0.12	0.11	0.12	0.11	0.11	0.11	0.11	1.35
Area Lights	22.72	21.68	25.33	23.53	24.46	24.40	23.59	25.33	23.53	23.59	22.66	23.59	284.45
Total	43.22	40.84	47.30	46.15	54.54	63.97	71.16	72.91	57.55	48.55	43.16	44.58	633.93

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	332.2	252.7	182.8	5.5	0.2	-	-	-	-	1.8	89.2	259.9	1,124.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	16.5	16.4	19.2	17.4	16.7	15.3	13.7	14.0	13.0	13.6	14.2	16.0	186.0
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	348.7	269.1	202.0	22.9	16.9	15.3	13.7	14.0	13.0	15.4	103.4	275.9	1,310.3



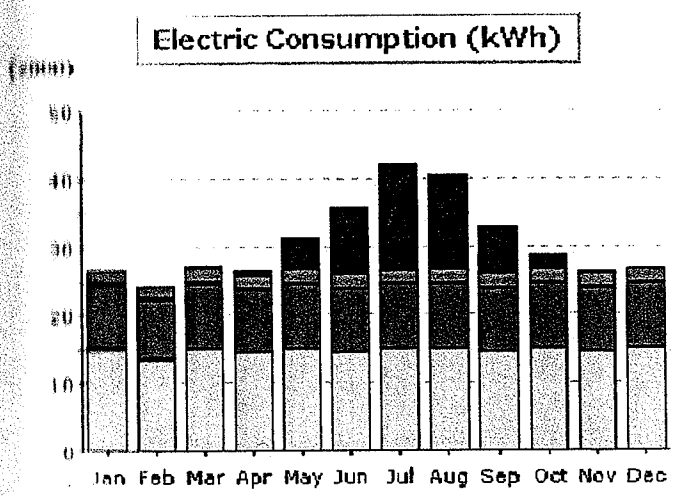


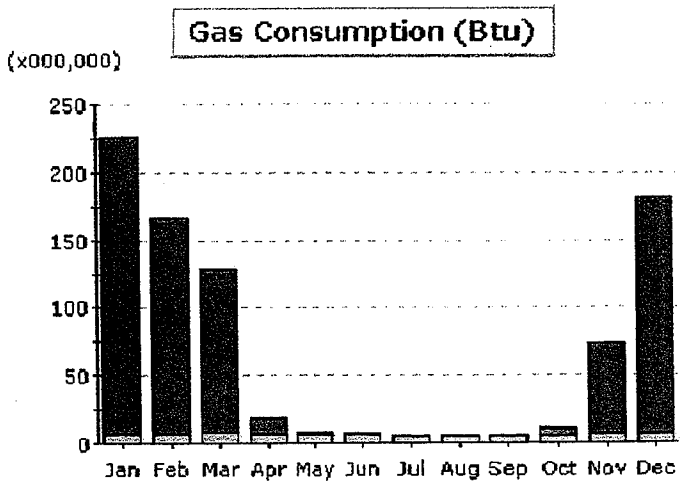
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	1.20	6.80	14.28	22.21	19.63	9.84	2.89	0.40	-	77.24
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.90	2.63	2.92	2.80	2.92	2.82	2.90	2.92	2.82	2.90	2.82	2.90	34.23
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	13.39	12.14	13.47	12.95	13.47	13.02	13.39	13.47	13.02	13.39	13.02	13.39	158.13
Task Lights	0.11	0.10	0.12	0.11	0.12	0.11	0.11	0.12	0.11	0.11	0.11	0.11	1.35
Area Lights	21.60	19.59	21.76	20.88	21.76	21.04	21.60	21.76	21.04	21.60	21.04	21.60	255.25
Total	38.19	34.63	38.44	38.01	45.10	51.27	60.21	57.89	46.85	40.97	37.53	38.18	527.27

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	298.4	215.4	160.6	14.1	0.7	-	-	-	0.1	6.3	88.5	236.5	1,020.7
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	9.7	9.1	10.2	9.6	9.2	8.2	7.8	7.5	7.2	7.7	8.1	9.1	103.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	308.1	224.6	170.8	23.7	10.0	8.2	7.8	7.5	7.3	14.0	96.7	245.6	1,124.1



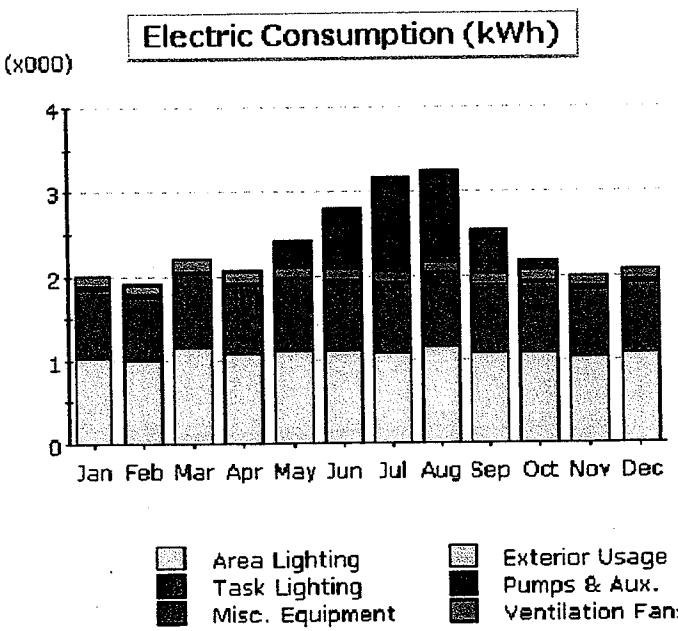


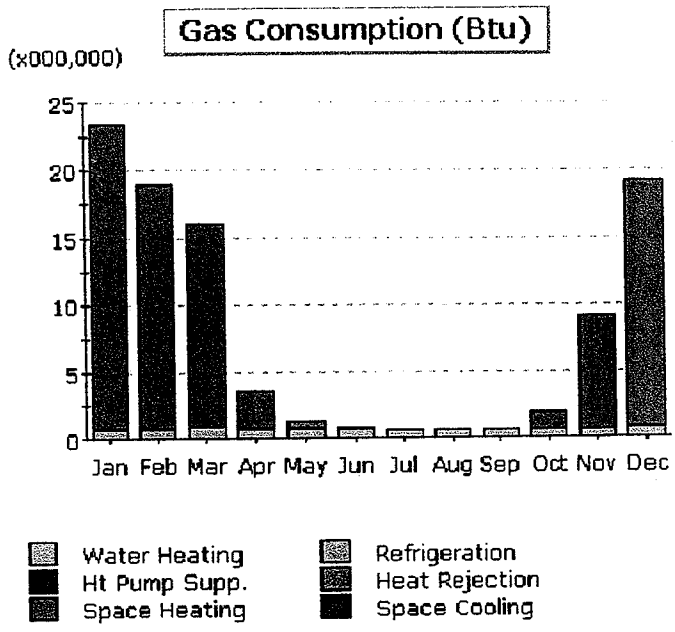
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.79	4.57	9.94	15.46	13.64	6.86	1.94	0.25	-	53.45
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.03	1.84	2.04	1.96	2.04	1.98	2.03	2.04	1.98	2.03	1.98	2.03	23.98
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	9.46	8.57	9.52	9.14	9.52	9.20	9.46	9.52	9.20	9.46	9.20	9.46	111.70
Task Lights	0.08	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.93
Area Lights	14.95	13.57	15.07	14.45	15.07	14.57	14.95	15.07	14.57	14.95	14.57	14.95	176.73
Total	26.70	24.22	26.88	26.49	31.31	35.77	41.98	40.35	32.70	28.53	26.21	26.69	367.84

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	219.40	159.98	121.07	11.42	0.73	-	-	-	0.04	4.81	67.75	175.02	760.21
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	7.25	6.84	7.62	7.15	6.90	6.14	5.82	5.58	5.38	5.77	6.08	6.77	77.30
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	226.65	166.82	128.69	18.57	7.63	6.14	5.82	5.58	5.41	10.58	73.83	181.79	837.51



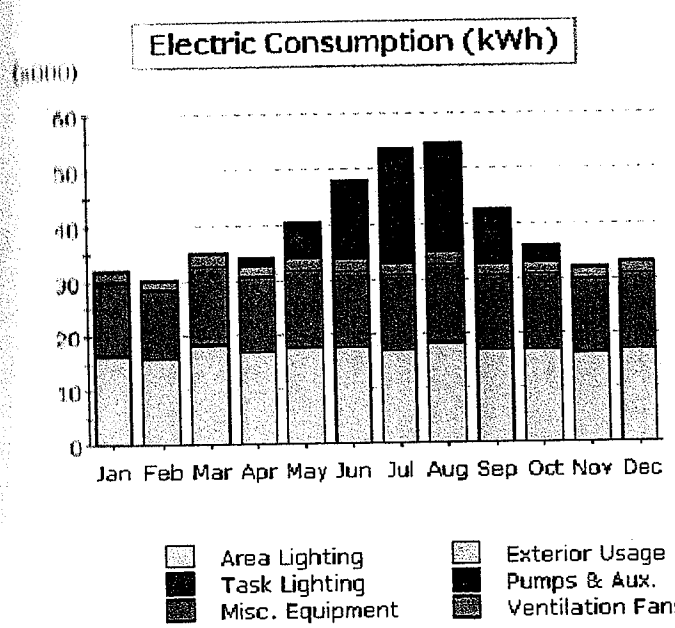


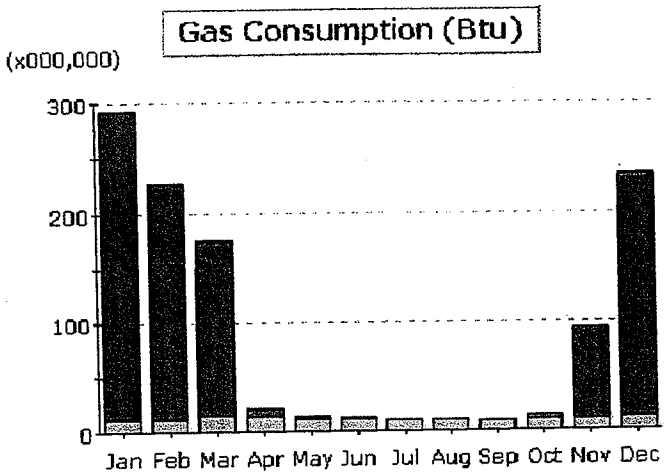
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.03	0.30	0.72	1.12	1.07	0.51	0.11	0.01	-	3.87
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.13	0.13	0.15	0.14	0.14	0.14	0.14	0.15	0.14	0.14	0.13	0.14	1.65
Pumps & Aux.	0.04	0.03	0.03	0.02	0.01	0.00	-	0.00	0.00	0.02	0.03	0.04	0.21
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.81	0.75	0.86	0.81	0.84	0.83	0.83	0.86	0.81	0.83	0.80	0.83	9.85
Task Lights	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.06
Area Lights	1.04	0.99	1.16	1.08	1.12	1.11	1.08	1.16	1.08	1.08	1.04	1.08	13.00
Total	2.02	1.91	2.21	2.07	2.42	2.81	3.17	3.25	2.54	2.17	2.00	2.08	28.64

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	22.58	18.16	15.15	2.70	0.48	-	-	-	0.03	1.32	8.48	18.41	87.32
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.76	0.75	0.88	0.80	0.77	0.70	0.63	0.64	0.60	0.63	0.65	0.74	8.54
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	23.34	18.91	16.03	3.50	1.25	0.70	0.63	0.64	0.63	1.95	9.14	19.15	95.86





Electric Consumption (kWh x000)

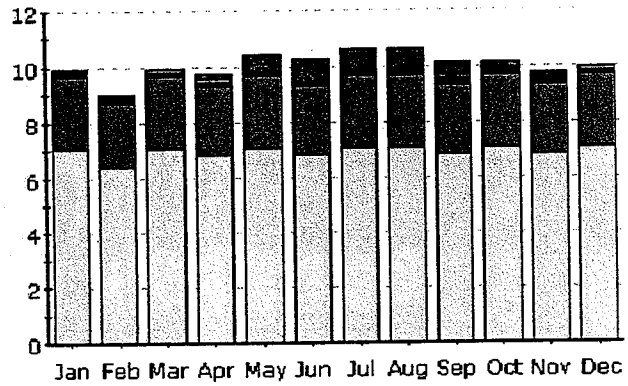
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	1.33	6.48	14.11	20.57	19.54	9.87	2.82	0.21	-	74.93
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	2.02	1.94	2.28	2.11	2.19	2.19	2.11	2.28	2.11	2.11	2.02	2.11	25.48
Pumps & Aux.	0.04	0.03	0.03	0.02	0.01	0.00	-	0.00	0.00	0.02	0.03	0.04	0.21
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	13.39	12.46	14.24	13.46	13.95	13.74	13.67	14.24	13.46	13.67	13.17	13.67	163.10
Task Lights	0.08	0.08	0.09	0.08	0.09	0.09	0.08	0.09	0.08	0.08	0.08	0.08	1.02
Area Lights	16.48	15.72	18.37	17.06	17.74	17.69	17.11	18.37	17.06	17.11	16.43	17.11	206.24
Total	32.00	30.23	35.01	34.06	40.45	47.82	53.54	54.52	42.59	35.80	31.95	33.00	470.98

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	280.0	214.4	160.5	8.4	0.5	-	-	-	-	3.7	84.0	221.8	973.3
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	12.5	12.4	14.5	13.2	12.7	11.6	10.4	10.6	9.8	10.3	10.7	12.1	140.9
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	292.5	226.8	175.0	21.6	13.2	11.6	10.4	10.6	9.8	14.1	94.8	233.9	1,114.3

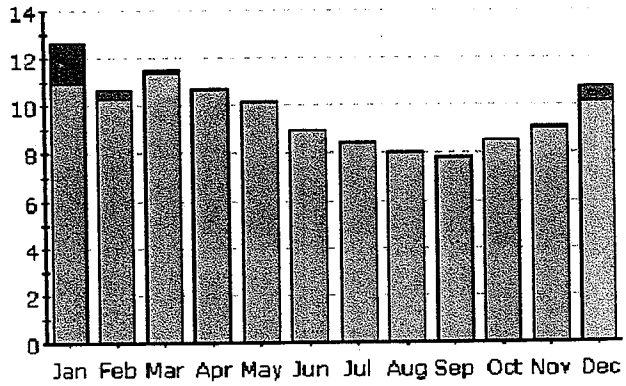
Electric Consumption (kWh)

(x000)



Gas Consumption (Btu)

(x000,000)



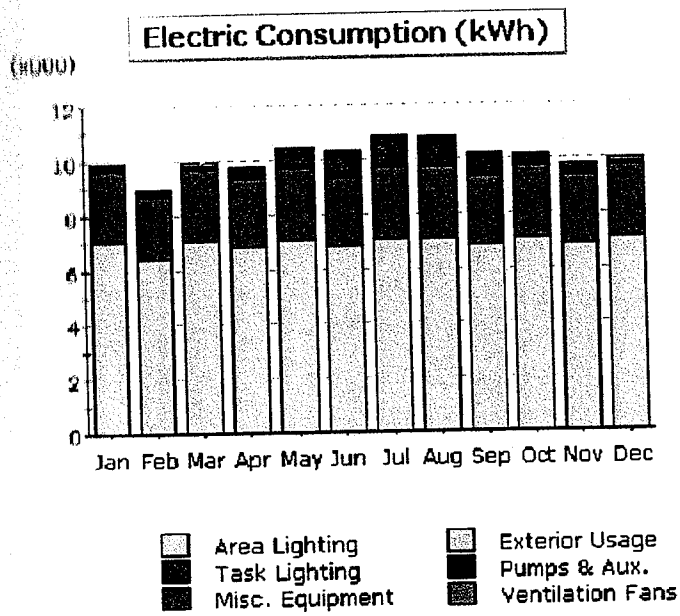
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.24	0.61	0.79	0.85	0.85	0.66	0.25	0.16	-	4.41
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.11	0.10	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	1.34
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.61	2.35	2.61	2.52	2.61	2.52	2.61	2.61	2.52	2.61	2.52	2.61	30.69
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.05	6.37	7.05	6.82	7.05	6.82	7.05	7.05	6.82	7.05	6.82	7.05	83.00
Total	9.96	8.99	9.94	9.77	10.41	10.25	10.62	10.62	10.14	10.10	9.75	9.95	120.50

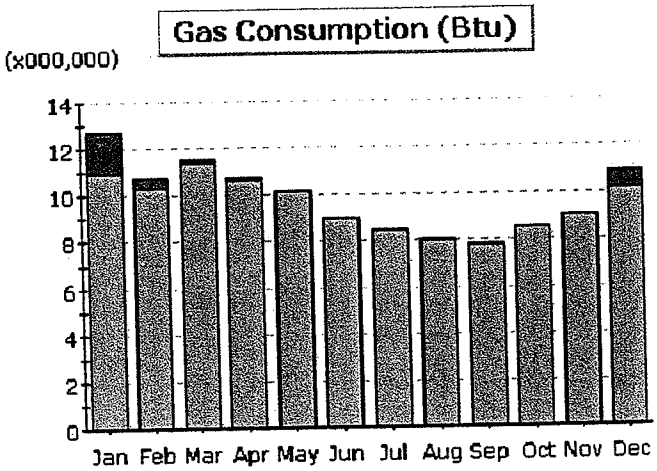
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.64	0.41	0.15	0.02	-	-	-	-	-	-	0.10	0.62	2.94
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	10.98	10.28	11.36	10.69	10.14	8.95	8.45	8.01	7.81	8.52	9.00	10.20	114.39
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	12.62	10.69	11.52	10.71	10.14	8.95	8.45	8.01	7.81	8.52	9.10	10.81	117.33

Electric Consumption (kWh)



Gas Consumption (Btu)



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.24	0.60	0.87	1.10	1.06	0.71	0.25	0.16	-	5.00
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.10	0.09	0.10	0.09	0.10	0.09	0.10	0.10	0.09	0.10	0.09	0.10	1.16
Pumps & Aux.	0.19	0.17	0.17	0.08	0.03	0.00	-	0.00	0.02	0.08	0.13	0.18	1.06
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	2.61	2.35	2.61	2.52	2.61	2.52	2.61	2.61	2.52	2.61	2.52	2.61	30.69
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	7.05	6.37	7.05	6.82	7.05	6.82	7.05	7.05	6.82	7.05	6.82	7.05	83.00
Total	9.94	8.98	9.93	9.76	10.39	10.32	10.85	10.81	10.17	10.09	9.73	9.93	120.90

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	1.76	0.45	0.14	0.02	0.01	-	-	-	0.01	0.03	0.03	0.64	3.08
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	10.98	10.29	11.37	10.69	10.14	8.96	8.47	8.03	7.81	8.51	8.99	10.19	114.43
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	12.74	10.73	11.50	10.71	10.15	8.96	8.47	8.03	7.82	8.54	9.02	10.84	117.51

and TDM measures. The microscale analysis indicates that project-related CO concentrations are the same as or slightly higher than the 2012 No-Build concentrations, however the project will satisfy the SIP criteria for CO because the 2012 Build condition CO concentration is below the NAAQS.

Greenhouse Gas Policy

The proposed project is subject to EEA's Greenhouse Gas (GHG) Policy that requires Proponents to quantify project-related GHG emissions and propose and quantify the impact of mitigation measures to reduce GHG emissions. The Proponent submitted the results of the GHG analysis with the EENF. In the analysis, the Proponent calculated GHG emissions from both mobile sources and direct and indirect stationary sources. While the project is in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. Direct and indirect carbon dioxide (CO_2) emissions from the proposed building sources were calculated using the EQUEST model. The Proponent evaluated the change in CO_2 emissions from project-related traffic and proposed building/energy consumption sources for the 2007 Existing, the 2012 No-Build, the 2012 Build and the 2012 Build with Improvements Conditions. As presented in the EENF, total CO_2 emissions in the Build Condition are expected to increase by 9,526.2 tons per year (tpy) from the No-Build Condition. With recommended mitigation measures in place, CO_2 emissions are estimated to be reduced by 970.3 tpy; a 10.19% reduction.

Mobile Sources

Mobile source emissions for the 2012 Build Condition are estimated to be 136,560.7 tpy, reflecting an increase of 5,801.7 tpy from the No-Build Condition. Under the 2012 Build Condition with Improvements, CO_2 emissions are estimated to be 136,101.3 tpy, representing a decrease of 459 tpy (8% decrease). According to the EENF, this reduction is due to geometric and operational improvements of the study area roadways and proposed TDM measures. The Proponent should clarify whether the analysis submitted with the EENF quantified the GHG reduction impact of proposed TDM measures. In the Single EIR, the Proponent should evaluate the impact of TDM measures following guidance in the EEA Policy; this analysis should include the Proponent's expanded commitment to TDM measures in response to recommendations from MassDEP.

Stationary Sources

For stationary sources, CO_2 emissions in the 2012 Build Condition are expected to be 4,609.10 tpy, reflecting an increase of 3,724.5 tpy from the No Build Condition. Under the 2012 Build Condition with Improvements, CO_2 emissions are expected to be 4,098.2 tpy, resulting in a decrease of 510.9 tpy (approximately 14% reduction). The following measures are listed in the EENF to reduce stationary source emissions:

- Use highly-reflective (high-albedo) roofing materials
- Maximize interior daylighting through increased building perimeter and use of skylights and light wells

- Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance
- Incorporate super insulation to minimize heat loss
- Use efficient, directed exterior lighting
- Incorporate motion sensors and lighting and climate control

The results of the EQUEST energy modeling are presented in an Appendix to the EENF. In the Single EIR, the Proponent should provide this information in an updated format. The information in the EENF is difficult to interpret; tables and graphs displaying electricity and gas consumption are not labeled and the units on graphs change without explanation. The Proponent should clearly present the results of calculations used to quantify existing conditions, the Build Condition, and the impact of proposed emissions-reduction mitigation. If the Proponent uses bar graphs, graphs should be produced in color or clearly labeled so that the reader can understand the results. In response to the GHG Policy, the Single EIR should also present the data that were used to model energy use in the proposed building. A typical set of modeling inputs might include the following: project size and configuration; type of heating, ventilation and cooling systems; amount of glazing; and potential types of usage and hours of operation.

General

The EENF includes a summary of total CO_2 emissions results from stationary and mobile sources. The Build Condition summary breaks out emissions by building use; the list includes pet store, grocery store, department store, sporting goods store, electronics store, bank, retail and anchor. The Single EIR should clarify this information and provide additional information on what factors were applied to generate estimated emissions reductions and how reductions were allocated among the mix of mitigation measures that will be incorporated into the project.

The discussion in the EENF did not present a discussion of how the Proponent developed its GHG reduction mitigation alternatives. The GHG Policy states that when comparing the preferred alternative to other alternatives with greater GHG reduction, the Proponent should explain which alternatives were rejected, and the reasons for rejecting them. The Proponent should fully explain any trade-offs inherent in the evaluation of GHG reduction measures, such as increased impacts on some resources to avoid impacts to other resources.

The Proponent notes that the majority of the buildings for the project will be built by future tenants. According to the EENF, the Proponent will strongly encourage and incorporate where feasible measures to reduce project-related GHG impacts. The EENF included a table outlining a comprehensive list of GHG emissions mitigation measures; the Proponent states that some of the measures are being considered for the project. Elsewhere in the EENF, the Proponent presents a list of sustainable design measures in the EENF that may potentially be incorporated into the project. The Proponent should clarify how the redevelopment project will function and outline how much of the actual project it will construct and manage, how much will be completed by tenants, and how much control the Proponent will have over what tenants build. The Proponent should clarify in the Single EIR what specific measures will be implemented by the Proponent at the Westinghouse redevelopment site and should evaluate these measures as part of the updated response to the GHG policy. The Proponent should provide more detail about

the responsible party for specific mitigation measures, how and when they will be implemented, and how the success of mitigation measures will be monitored.

The GHG Policy requires mitigation for net project-related emissions and the Proponent is obligated to identify and commit to specific mitigation measures during the MEPA review process. Updated mitigation for mobile-source emissions should be presented in the draft Section 61 Finding submitted in the Single EIR for use by MassHighway. The Proponent should also identify and commit to mitigation measures for stationary source emissions in the Single EIR.

Hazardous Waste

The project will require MassDEP approvals under MGL Chapter 21E or the MCP in the form of Response Action Outcomes (RAOs) or other actions associated with final remediation and clearance of open Release Tracking Numbers (RTNs) at the project site. According to the EENF, two RTNs at the site have achieved closure and one is currently active. The currently active RTN covers two release conditions: chlorinated volatile organic compounds (CVOCs) in groundwater on the northern side of the site and petroleum in soil and groundwater on the southern portion of the site. The Proponent should note comments from MassDEP regarding the active RTN at the site and should provide an update on remediation activities in the Single EIR.

Construction Period Impacts

The construction of the project will include demolition of multiple existing buildings. The Proponent states in the EENF that much of the construction debris will be diverted and reused on-site or recycled to the extent feasible. All unusable construction waste will be managed and transported to an approved disposal facility by a licensed waste management contractor. The Proponent will develop an Asbestos Abatement Work Plan prior to demolition. The Proponent must comply with MassDEP's Solid Waste and Air Quality Control regulations and should respond in the Single EIR to comments from MassDEP regarding demolition issues. The Proponent should implement measures to alleviate dust, noise and odor nuisance conditions which may occur during the construction activities. I encourage the proponent to work with MassDEP to implement construction-period emission mitigation through its Diesel Retrofit Program, which can be reviewed online at http://www.mass.gov/dep/air/diesel/conretro.pdf.

Mitigation

The Single EIR should contain a separate chapter on mitigation measures. The chapter on mitigation should include an updated draft Section 61 Finding for use by MassHighway. The Section 61 Finding should contain a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation, the identification of the parties responsible for implementation of the mitigation, and a schedule for the implementation of the mitigation.

As outlined above, a commitment to TDM measures and mitigation for mobile source GHG emissions should be included in the draft Section 61 Finding for MassHighway. The chapter on mitigation should also present a clear commitment to measures to mitigate stationary source GHG emissions.

COMMONWEALTH OF MASSACHUSETTS
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DEPARTMENT OF ENVIRONMENTAL PROTECTION
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Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

April 9, 2008

For Craig Givens, WERO

Re: GHG & Transportation Review of Expanded Environmental Notification Form for Westinghouse Redevelopment in Springfield, Massachusetts, EEOEA No. 14205

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the Expanded Environmental Notification Form (EENF) for the Westinghouse Redevelopment in Springfield, Massachusetts. According to the EENF, the proposed project will consist of demolishing approximately 916,000 square feet of existing warehouses and manufacturing buildings to accommodate 470,000 square feet of retail and restaurant development and 1,069 new parking spaces.

GHG Direct and Indirect Stationary Sources

The report acknowledges the applicability of the MEPA Greenhouse Gas Policy to the project, but the level of analysis and commitment to reduce C02 emissions is inadequate. The report estimates that the direct/indirect source reduction from mitigation measures will be approximately 510 tons per year. There is, however, no information as to what factors were applied to generate that estimate and how it was allocated among the mix of Architectural Design/Treatments and Building Systems the project will incorporate.

More significantly, while the report summarizes a range of GHG mitigation measures the project could adopt (Table 4-5), it lacks any analysis of whether a particular measure is infeasible for this project and in many instances is equivocal on whether the proponent will even make the effort to determine whether it is practicable to apply energy-efficient designs and technologies. For example, the report, at 1-15-16, indicates that incorporation of energy efficiency strategies and LEED Certification design measures "may be evaluated", and the use of energy efficient designs and materials will be utilized where practicable and feasible. While practicability and feasibility are relevant performance standards it is in the context of minimizing potential adverse impacts. The proponent should provide the data, criteria and analysis underlying their feasibility conclusions to facilitate public comment and the exchange of information between the proponent and agencies that have expertise in this rapidly changing field.

Some of the limitation in the analysis and commitments may reflect that the majority of the buildings will be built by future tenants. In that regard, it is not clear if the stationary/indirect source GHG analysis only applies to the components of the projects planned to be constructed by the proponent or the full-build out. If the former, full build out C02 generation estimates should be provide understanding that

the lack of detailed information may require making assumptions or using estimate ranges. If full build out is known, than the mitigation analysis should be equally robust.

Not every possible mitigation measure needs to be subjected to a complete technological and financial analysis. But for the buildings the proponent is constructing and given availability of technical and payback information on LEED elements, a basic analysis should either commit to adopt those elements or do a credible job in explaining why they are not practicable. For example, many projects now routinely commit to high efficiency HVAC systems and the infrastructure for peak shaving should be built into the core-shell designs. Similarly, where there are mitigation commitments made in areas such as construction material recycling, building orientation and day-lighting for solar gain additional specificity should be provided in the SDEIR to give Section 61 Findings credibility. Even in regard to future construction by tenants, the proponent should explain why it is not practicable to commit to adopt provisions in development agreements that would require their buildings to incorporate basic energy efficiency technologies, or CO2 savings equivalent to the buildings.

If you have further questions contact Philip.Weinberg@state.us, 617-292-5972.

Mobile Sources-GHG and Criteria Pollutants

According to the EENF notice in the *Environmental Monitor,* the project will draw over 18,000 new daily vehicle trips (the full EENF references 16,700 vehicle trips, however) to the project once construction is completed in 2012. The project proponent conducted a mesoscale air quality modeling analysis consistent with MassDEP protocol, as well as a microscale analysis of the project's potential impact on carbon monoxide emissions at several local intersections.

The project proponent also conducted a greenhouse gas (GHG) analysis of the project and estimated the potential carbon dioxide (CO2) emissions in the 2012 Build year. The *MEPA Greenhouse Gas Emissions Policy and Protocol* requests that project proponents express net new trips in terms of vehicles miles traveled (VMT) for weekday and weekend conditions and break down vehicle trips by customer, employee and truck trips. Since the project proponent did not provide these data, MassDEP requests that the data be provided in the Single Environmental Impact Report (SEIR).

The project proponent has committed to implementing several measures to reduce the CO2, volatile organic compound (VOC), and nitrogen oxide (NOx) emissions from mobile sources associated with the construction and operation of the project. However, the EENF did not quantify the estimated emission benefits of each measure. The EENFindicates that the transportation measures would reduce CO2 by 459 tons per year; however, there is no information on the reductions that would be attributed to each measure. MassDEP requests that these data be provided in the SEIR.

Furthermore, due to the high number of vehicle trips, the project proponent—and subsequent tenants—must make additional effort to reduce the vehicle emissions impact of the project on the surrounding air quality. To this end, MassDEP has identified two regulations and numerous measures that can further reduce emissions of CO2, VOC, and NOx emissions from mobile sources associated with the project.

Requirements

Compliance with the Massachusetts Rideshare Regulation

MassDEP implements the Rideshare Regulation (310 CMR 7.16), a clean air program that applies to employers with 250 or more daily employees. Employers subject to the Rideshare Program must implement a series of incentives that are designed to reduce the number of trips made by employees who drive alone to work. To date, employers with 1,000 or more employees and employers with 250 or more employees that are also subject to the Air Operating Permit Program (as detailed in MassDEP's regulation, 310 CMR 7.00, Appendix C) must comply with the Rideshare regulation.

The Rideshare Program requires employers to submit annual reports, determine how their employees commute to work, and provide transit passes and a carpool-matching program to employees, among other incentives. Should the proposed project employ 250 or more employees, the project proponent should contact MassDEP at 617-292-5663 for assistance in complying with this air quality program.

Compliance with the Massachusetts Idling Regulation

The Massachusetts Idling regulation (310 CMR 7.11) prohibits motor vehicles, including construction equipment, from idling their engines more than five minutes unless the idling is necessary to service the vehicle or to operate engine-assisted power equipment (such as refrigeration units) or other associated power. The proponent should consider posting idling restriction signs on the premises to remind all drivers, patrons, and delivery personnel of the state's idling regulation. Questions regarding this regulation should be directed to Julie Ross of MassDEP at 617-292-5958.

Recommendations

In addition, MassDEP advises the project proponent take advantage of the following measures to reduce the emissions impact of the project on the air quality in the area.

Delivery Restrictions

MassDEP recommends that the proponent restrict truck deliveries to the retail complex to off-peak hours to minimize traffic impacts and diesel emissions in the project area.

Construction Period Air Quality Mitigation Measures

MassDEP recommends that project proponents and contractors install after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). MassDEP commends the project proponent for committing to installing these devices to reduce engine emissions. MassDEP's guidance document, "Diesel Engine Retrofits in the Construction Industry – A How to Guide", is available on MassDEP's website at http://www.mass.gov/dep/air/diesel/conretro.doc.

In addition, the project proponent stated that it would require contractors and subcontractors to use either low sulfur diesel (LSD) fuel or ultra low sulfur diesel (ULSD) fuel. LSD fuel, which has a sulfur content of 500 parts per million (ppm), is currently required for off-road engines under federal regulation. ULSD fuel, with a sulfur content of 15 ppm, will be required for off-road engines in 2010. However, because of the current availability of ULSD, MassDEP recommends the early use of ULSD fuel to reduce additional amounts of fine particulate matter, which is associated with the state's high incidence of asthma and is a probable carcinogen.

Transportation Demand Management (TDM) Measures

MassDEP acknowledges that the project proponent has committed to implementing several TDMs at the project, including bicycle racks, constructing new sidewalks, and working with the Pioneer Valley Transit Authority to install bus bays and shelters. However, because the project is expected to generate 18,000 vehicle trips per day, MassDEP recommends that the project proponent commit to, rather than encourage, implementing other measures listed in the EENF, such as a guaranteed ride home program, preferential parking for carpools, vanpools, and alternatively-fueled vehicles, and subsidizing transit passes.

In addition, MassDEP recommends that the project proponent implement the following additional incentives to reduce as many vehicle trips of employees and shoppers as possible. The SEIR should contain a list of the measures that will be implemented at the project.

- **On-Site Vehicle Trip Reduction Coordinator.** MassDEP recommends that the proponent designate an on-site vehicle trip reduction coordinator to implement, promote and follow up on the use of the mitigation trip reduction measures.

- **Transportation Management Association (TMA).** MassDEP recommends that the proponent join or help form a TMA that serves the project area. TMAs are organizations that help several employers in a local area develop and implement incentives that reduce traffic and trips to the worksite. Employers pay a fee for this service to a centralized coordinator to market and implement these incentives on their behalf.

- **Walking Incentives.** MassDEP recommends that the proponent provide landscaping, efficient lighting, benches, and other amenities to further encourage walking to and from the site.

- **Bicycle Incentives.** MassDEP recommends that the proponent install employee locker and shower facilities and other enhancements (e.g., bicycle helmets, coupons to bike stores and bike locks) to further encourage bicycle commuting.

Finally, MassDEP recommends that the project proponent explore ways to encourage shoppers to use transit or carpool to the proposed project, including offering discounts to customers who come to the retail establishment in a carpool, by transit or other alternative to driving alone in their vehicles.

Should you have any questions about the comments on reducing emissions of mobile sources in this letter, please contact Susan Lyon at 617-556-1101 or susan.lyon@state.ma.us.

W\MEPA\LYON\Westinghouse EENF March 2008

4

Air Quality

Introduction

This chapter presents the results of the air quality study for the Project. The 1990 Clean Air Act Amendments (CAAA) and the Massachusetts State Implementation Plan (SIP) require that a proposed project not cause any new violation of the National Ambient Air Quality Standards (NAAQS) for pollutants of concern, or increase the frequency or severity of any existing violations, or delay attainment of any NAAQS.

In accordance with the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) and Massachusetts Environmental Policy Act (MEPA) Greenhouse Gas Emissions Policy and Protocol, the air quality study for the Project includes the following three analyses: an ozone regional (mesoscale) analysis, a localized (microscale) analysis of mobile source pollutants, and an assessment of greenhouse gas (GHG) emissions. The mesoscale analysis evaluated the regional ozone precursor impacts of volatile organic compounds (VOC) and nitrogen oxides (NOx), the microscale analysis evaluated the local carbon monoxide (CO) concentrations, and the greenhouse gas analysis evaluated the regional carbon dioxide (CO_2) concentrations.

The ozone mesoscale analysis demonstrates that the Project is in compliance with the Massachusetts Department of Environmental Protection's (DEP's) policy on ozone emissions. The Project will incorporate reasonable and feasible mitigation measures, including a Transportation Demand Management (TDM) program to reduce volatile organic compounds (VOC) and oxides of nitrogen (NOx) emissions for the build condition.

The microscale analysis evaluated site-specific impacts from vehicles traveling through congested intersections in the Project area. This analysis demonstrates that all existing and future CO concentrations will meet the NAAQS.

The GHG emissions analysis demonstrates that the Project is in compliance with the EEA policy on GHG emissions. The Project will include mobile and stationary source mitigation measures that will result in reduced GHG emissions for the build condition, with improvements related to energy efficiency and other sustainable design and operation measures.

Background

The Massachusetts Department of Environmental Protection (DEP) has established guidelines that define the modeling and review criteria for air quality analyses prepared pursuant to the Massachusetts Environmental Policy Act (MEPA) process. These guidelines require that the proposed project determine the change in project-related vehicle emissions. If emissions from the Build Condition are greater than the No-Build Condition, then the proposed project should include all reasonable and feasible emission reduction mitigation measures. Massachusetts has incorporated this criterion into the SIP.

The 1990 Clean Air Act Amendments (CAAA) resulted in states being divided into attainment and non-attainment areas, with classifications based upon the severity of the air quality issues in the area. A non-attainment area is an area that has had measured pollutant levels that exceed the National Ambient Air Quality Standards (NAAQS). The CAAA established emission reduction requirements that vary by an area's classification.

The DEP and Environmental Protection Agency (EPA) have established guidance that defines the air quality modeling and review criteria for analyses prepared pursuant to the CAAA and SIP. The CAAA and the SIP require that a proposed project not:

- Cause any new violation of the NAAQS;
- Increase the frequency or severity of any existing violations; or
- Delay attainment of any NAAQS.

The Project is located in Springfield, which has the following designations:

CO Status. Springfield is classified as a Maintenance attainment area for CO. Proposed projects that are located in CO non-attainment or Maintenance attainment areas are required to evaluate their impact on CO concentrations and the NAAQS.

Ozone Status. Massachusetts has been determined to be a non-attainment area, statewide, for ozone. The State has been divided into two non-attainment areas, Eastern and Western Massachusetts. On June 15, 2005, the EPA revoked the 1-hour ozone standard for most areas in the country. This action means that the 1-hour ozone non-attainment area classified as "Serious," is no longer applicable for Western Massachusetts. Only the 8-hour ozone NAAQS applies. The Project is

located in the Western Massachusetts 8-hour ozone non-attainment area, which has been classified as "Moderate."

Greenhouse Gas Status. The Executive Office of Energy and Environmental Affairs (EEA) issued a policy and protocol for evaluating greenhouse gas emissions from proposed projects with particular emphasis on carbon dioxide (CO_2) emissions. This policy requires that certain projects quantify greenhouse gas emissions generated by the project and identify measures to reduce or minimize these impacts. The Project has responded to this policy and has evaluated CO_2 emissions from mobile and stationary sources generated by the Project.

Modeling Methodology

The DEP guidelines require that the air quality study utilize traffic and emissions data for existing and future (No-Build and Build) conditions. The traffic and emissions data are incorporated into the DEP and the U.S. Environmental Protection Agency (EPA) air quality models to generate emissions estimates that demonstrate whether or not the proposed project will have air quality impacts.

The air quality study evaluated three conditions, 2007 Existing, future 2012 No-Build, and 2012 Build Conditions. The 2007 Existing conditions included the existing traffic conditions in the study area, and accounted for the existing roadway geometrics and observations of traffic flow. Future 2012 No-Build condition included regional background traffic growth and planned roadway improvements. Anticipated future site-generated traffic volumes for the proposed mix of retail type uses (470,000 square feet) were then added to the 2012 No-Build traffic flow networks to reflect the 2012 Build scenario. A more detailed discussion of the information included in the 2012 No-Build and 2012 Build conditions can be found in Chapter 3, *Transportation.*

Mesoscale and Microscale Modeling Methodology

The mesoscale and microscale air quality analyses developed traffic data (volumes and speeds) and emission factor data for 2007 Existing and 2012 No-Build, and 2012 Build Conditions. These data were incorporated into air quality models to demonstrate that the project will meet the CAAA and SIP criteria. The mesoscale analysis calculated the changes in total pollutant emissions for the existing and future conditions within the study area. The microscale analysis calculated CO concentrations for the same conditions at congested intersections near the Project Site. The year 2012 was selected as the future year of analysis because MEPA's policy requires that a proposed project look five years into the future from the existing year of analysis.

Mesoscale Analysis

Consistent with the requirements of the SIP, the purpose of the mesoscale analysis is to estimate the area wide emissions of VOCs and NOx during a typical day in the peak ozone season (summer). The mesoscale analysis evaluated the change in emissions from the average daily traffic volumes, roadway lengths, and vehicle emissions. To demonstrate compliance with the SIP criteria, the air quality study must show the proposed project's change in daily (24-hour period) emissions. Using EPA-recommended air quality modeling techniques, total pollutant emissions were calculated for the project's phases under the 2007 Existing and future 2012 No-Build, and 2012 Build Conditions. The mesoscale study area, at a minimum, includes all the roadway links and intersections that are projected to experience a ten percent increase in traffic from the project and that experience a Level-of-Service (LOS) designation of "D" or lower under existing or future conditions. Major roadways and intersections that were included in the mesoscale analysis are depicted in Figure 4.1 and include:

- Interstate 291,
- Page Boulevard/St. James Boulevard (Route 20/20A),
- Roosevelt Avenue,
- East Street and,
- St. James Avenue.

Microscale Analysis

The microscale analysis evaluated the CO concentrations at congested intersections in the study area during the peak CO season (winter). Intersections in the study area were ranked based on traffic volumes and level of service. As shown in Figure 4.2, the following intersections were selected for analysis because they were the most congested intersections in the study area:

- St. James Boulevard (Route 20/20A) at Page Boulevard and Haumont Terrace,
- Page Boulevard at Stevens Street,
- Page Boulevard at Prentice Street and East Site Drive, and
- Page Boulevard at Roosevelt Avenue.

The microscale analysis calculated maximum 1-hour and 8-hour CO concentrations in the Project area. The EPA's computer model CAL3QHC[1] was used to predict CO concentrations at receptor locations for each intersection. These receptor locations were selected since they are located where the public has access and is expected to be for periods of time. Receptors were placed at the edge of the roadway, but not closer

[1] *User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections*, US Environmental Protection Agency, Office of Air Quality Planning and Standards, Technical Support Division; Research Triangle Park, NC; EPA-454/R-92-006; November 1992.

than 10 feet (3 meters) from the nearest travel lane, so that they were not within the roadway mixing cell. The results calculated at these receptor locations represent the highest concentrations at each intersection. Receptor locations farther away from the intersections will have lower concentrations because of the CO dispersion characteristics. The receptor locations that are along the major roadways in the study area are also expected to have lower CO concentrations than intersection receptors. The emission rates for vehicles traveling along these roadways are much lower than the emission rates for vehicles queuing at intersections.

The 1-hour CO concentrations were calculated directly using the EPA computer model, with evening peak hour traffic and emission data. The 8-hour CO concentrations were derived by applying a persistence factor of 0.76 to the 1-hour CO concentrations. This persistence factor was calculated from the DEP's most recent annual monitoring report[2]. It represents the average ratio of second highest 8-hour to second highest 1-hour CO readings at DEP's four Boston-area permanent monitoring stations in the years 2002- 2006.

Emission Rates for Mesoscale and Microscale Analyses

The vehicle emission factors used in the mesoscale and microscale analysis were obtained using the EPA's MOBILE6.2[3] emissions model. MOBILE6.2 calculates emission factors from motor vehicles in grams per vehicle-mile for existing and future conditions. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts-specific conditions such as the vehicle age distribution, the statewide Inspection and Maintenance (I/M) Program, and the Stage II Vapor Recovery System.[4] VOC and NOx emission factors for the mesoscale analysis were determined using the DEP-recommended temperatures for the summer (ozone) season and similarly, for the microscale analysis, the CO emission factors were determined using winter (CO) seasons. A detailed presentation of the MOBILE6.2 input and output data are presented in the Appendix.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mesoscale analysis for VOC and NOx emissions used typical daily peak and off-peak traffic volumes for the ozone season (summer). The

2 *2000 Annual Report on Air Quality in New England*, US Environmental Protection Agency, Region I, Lexington, Massachusetts; July 2001

3 MOBILE6.2 (Mobile Source Emission Factor Model), The May 2004 release from US EPA, Office of Mobile Sources, Ann Arbor, MI.

4 The Stage II Vapor Recovery System is the process of collecting gasoline vapors from vehicles as they are refueled. This requires the use of a special gasoline nozzle at the fuel pump.

microscale analysis used the evening peak hour traffic conditions during the CO season (winter). Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The traffic data used in the air quality study are presented in the Appendix. The detailed traffic analysis is presented in traffic section of this report.

Existing Conditions Analysis (Ozone and CO)

Mesoscale Analysis

The purpose of the mesoscale analysis is to estimate the area wide emissions of VOC and NOx during a typical day in the peak ozone season (summer) consistent with the requirements of the SIP. The mesoscale analysis evaluates the change in VOC and NOx emissions from the average daily traffic volumes, roadway lengths, and vehicle emission rates. To demonstrate compliance with the SIP criteria, the air quality study must show the Project's change in daily (24-hour period) VOC and NOx emissions. Using EPA-recommended air quality modeling techniques, total pollutant emissions were calculated for the Project under the four conditions. The mesoscale analysis calculated the 2007 mobile source emissions from the major roadways in the study area. These emissions, estimated to be 303.3 kilograms per day (kg/day) of VOCs and 855.8 kilograms per day of NOx establish a baseline to which future emissions can be compared. Table 4-3 below presents the mesoscale analysis results for all build conditions.

Microscale Analysis

The microscale analysis determined that the 1-hour CO concentrations for 2007 Existing Condition ranged from a minimum of 3.9 parts per million (ppm) to a maximum of 6.7 ppm. The corresponding maximum 8-hour CO concentrations ranged from a minimum of 3.0 ppm to a maximum of 5.1 ppm, which is well below the CO NAAQS of 9.0 ppm. The microscale results are presented in Tables 4-1 and 4-2 below. All the 1-hour and 8-hour concentrations are below the CO NAAQS of 35 and 9 ppm, respectively. These values are consistent with the areas designation as a Maintenance CO attainment area.

Project Impacts: Ozone and CO Air Quality Analysis

Future estimates of Project-related emissions are based upon changes in traffic and emission factor data. The traffic data includes traffic volumes, vehicle-miles-of-travel, signal cycle timing, and physical roadway improvements. The emission factor data

includes years of analysis and roadway speeds. The following section reports on the findings of the air quality analyses for the Project retail development based upon changes in these data.

Mesoscale Emissions Predictions

The mesoscale analysis estimated the future regional VOC and NOx emissions due to the changes in average daily traffic volume, roadway characteristics, and vehicle emissions. Under the 2012 No-Build Condition, VOC emissions are estimated to be 189.9 kg/day and the NOx emissions were estimated to be 430.7 kg/day (Table 4-3). The 2012 No-Build Condition VOC emissions are lower than the 2007 Existing Conditions emissions due to the implementation of state and federal emission control programs, such as the Federal Motor Vehicle Emission Control Program, the Stage II Vapor Recovery System, and the Massachusetts Inspection and Maintenance program.

Under the 2012 Build Condition, the VOC emissions were estimated to be 201.3 kg/day and the NOx emissions were estimated to be 445.0 kg/day. This results in a minor increase of 11.4 kg/day in VOC emissions and an increase of 14.3 kg/day in NOx emissions from the 2012 No-Build Conditions (Table 4-3).

The SIP requires that proposed projects with VOC and NOx emissions from the Build Condition that are greater than the No-Build Condition emissions, include all reasonable and feasible emission reduction measures. Because under the Build Condition the VOC and NOx emissions are greater than the corresponding No-Build Condition, the Proponent will incorporate emission reduction mitigation measures. These mitigation measures include physical mitigation, such as intersection and the roadway improvements, and trip reduction mitigation measures (i.e., transportation demand management). These mitigation measures are further described in the Chapter 3, *Transportation*.

The Proponent has committed to trip reduction strategies including a range of Transportation Demand Management (TDM) measures which will further reduce the emissions of the Project. The TDM mitigation measures that are proposed are described below in the Proposed Air Quality Mitigation Measures section.

Microscale Concentration Predictions

The microscale analysis indicates that reductions in CO concentrations are expected to occur over time when compared to the 2007 Existing Condition. These reductions can be attributed to more efficient vehicles with enhanced emissions control technologies and the benefits of the Massachusetts' Vehicle Inspection and Maintenance program. None of the future No-Build and Build concentrations approaches the CO NAAQS of 35 ppm and 9 ppm for 1-hour or 8-hour, respectively.

The highest CO concentrations for each intersection are presented in Tables 4-1 and 4-2 below. The results show that the 2012 Build concentrations are the same as or slightly higher than the 2012 No Build concentrations. The results of the microscale analysis demonstrate that the Project satisfies the SIP criteria for CO because all the 2007 Existing Condition and 2012 No-Build and Build Conditions CO concentrations (both 1- and 8-hour values) are below the NAAQS.

Table 4-1
Predicted Maximum 1-Hour CO Concentrations[1]

Receptor Number	Receptor Site	2007 Existing Condition	2012 No-Build Condition	2012 Build Condition
Page Boulevard at Roosevelt Avenue				
1	Northeast Corner: St/ Mary's Church	6.2	5.9	7.1
2	Southeast Corner: Vacant Fire Station	6.7	6.2	7.7
3	Southwest Corner: Western Mass. Electric Co. Substation	6.1	5.9	7.1
4	Northwest Corner: Residential	6.0	5.9	6.9
Page Boulevard at Prentice Street and East Site Drive				
5	Northeast Corner between Prentice and East : Auto Insurance and Medical Equipment Office Buildings	5.5	5.2	5.8
6	Northeast Corner between East and Rt.20A: B&G Auto Service	6.6	6.2	7.8
7	Southeast Corner: Westinghouse/Site	6.2	6.1	7.3
8	Southwest Corner: Westinghouse/Site	6.4	6.2	7.1
9	Northwest Corner: Dunkin Donuts	6.0	5.7	6.9
Page Boulevard at Stevens Street				
10	Southeast Corner : Westinghouse/Site	5.3	6.4	7.4
11	Southwest Corner: Sunnyside Up Diner	5.5	6.3	7.8
12	North Side : Glendale Auto Parts Shop	5.6	6.1	7.0
St. James Boulevard (Route 20/20A) at Page Boulevard and Haumont Terrace				
13	Northeast Corner: Louis&Clark Drug Store	5.5	5.4	5.8
14	Southeast Corner : 2 Guys Pizzeria	5.6	5.4	5.8
15	Southwest Corner : First Place Realty	5.9	5.7	6.1
16	Northwest Corner : St. James Auto Shop	5.5	5.4	5.7

1 The values include background (3.0 ppm for 1 hour) and are expressed in parts per million (ppm).
Note: The 1-hour CO NAAQS is 35 ppm.

Table 4-2
Predicted Maximum 8-Hour CO Concentrations[1]

Receptor Number	Receptor Site	2007 Existing Condition	2012 No-Build Condition	2012 Build Condition
Page Boulevard at Roosevelt Avenue				
1	Northeast Corner: St/ Mary's Church	4.7	4.5	5.4
2	Southeast Corner: Vacant Fire Station	5.1	4.7	5.9
3	Southwest Corner: Western Mass. Electric Co. Substation	4.6	4.5	5.4
4	Northwest Corner: Residential	4.6	4.5	5.2
Page Boulevard at Prentice Street and East Site Drive				
5	Northeast Corner between Prentice and East : Auto Insurance and Medical Equipment Office Buildings	4.2	4.0	4.4
6	Northeast Corner between East and Rt.20A: B&G Auto Service	5.0	4.7	5.0
7	Southeast Corner: Westinghouse/Site	4.7	4.6	5.5
8	Southwest Corner: Westinghouse/Site	4.9	4.7	5.4
9	Northwest Corner: Dunkin Donuts	4.6	4.3	5.2
Page Boulevard at Stevens Street				
10	Southeast Corner : Westinghouse/Site	4.0	4.9	5.6
11	Southwest Corner: Sunnyside Up Diner	4.2	4.8	5.0
12	North Side : Glendale Auto Parts Shop	4.3	4.6	5.3
St. James Boulevard (Route 20/20A) at Page Boulevard and Haumont Terrace				
13	Northeast Corner: Louis&Clark Drug Store	4.2	4.1	4.4
14	Southeast Corner : 2 Guys Pizzeria	4.3	4.1	4.4
15	Southwest Corner : First Place Realty	4.5	4.3	4.6
16	Northwest Corner : St. James Auto Shop	4.2	4.1	4.3

1 The values include background (3.0 ppm for 8 hour) and are expressed in parts per million (ppm).
Note: The 8-hour CO NAAQS is 9 ppm.

Proposed Air Quality Mitigation Measures

In order to mitigate and reduce air quality impacts from Project-related traffic (discussed above in the mesoscale and microscales analyses), the Proponent will implement physical and operational improvements to the roadways to reduce delays and queuing, as well as implement TDM measures in order to reduce single-occupant vehicle trips to the Project Site and to minimize peak-period traffic demands in the study area. The proposed roadway and transportation improvements for the Project including the elements of the TDM program are described in detail in Chapter 3, *Transportation* of this EENF.

The results of the mesoscale analysis demonstrate that the roadway improvements will meet the transportation conformity criteria by reducing both VOC and NOx

emissions (Table 4-3). The mitigation measures result in improved geometry and operation in the Project area. The mitigation measures would result in a 2.1 kg/day VOC emissions reduction and a 0.6 kg/day NOx emissions reduction from the 2012 Build Condition.

Table 4-3
Mesoscale Analysis Results (kilograms per day)

Pollutant	2007 Existing Condition	2012 No-Build Condition[1]	2012 Build Condition	2012 Build with Mitigation Condition[2]	2012 Build vs. Build with Mitigation (difference)
Volatile Organic Compounds (VOCs)	303.0	189.9	201.4	199.2	-2.1
Oxides of Nitrogen (NOx)	855.8	430.7	445.0	444.4	-0.6

1 The future no build condition emissions are lower than the existing conditions emissions due to the implementation of state and federal emission control programs, such as the Federal Motor Vehicle Emission Control Program, the Stage II Vapor Recovery System, and the Massachusetts Inspection and Maintenance program.
2 The Build conditions used for the air quality analysis include the physical and operational mitigation proposed to improve traffic operations (as outlined in Chapter 3, *Transportation*).

Greenhouse Gas Emissions Analysis

The EEA recently developed and issued a policy that requires project proponents to implement feasible measures to minimize GHG emissions. This policy requires that projects undergoing review by the MEPA Office at the EIR level and meeting specific criteria (e.g., generation of 3,000 or more vehicle trips per day) quantify the Project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying project-related GHG emissions, the policy also requires proponents to quantify the impact of proposed mitigation in terms of emissions and energy savings. The goal of this policy is to identify measures to reduce or minimize the GHG emissions.

This section discusses the calculation of the GHG emissions from mobile sources and both direct and indirect stationary sources related to the Project. While GHG emissions include several gases, Carbon Dioxide (CO_2) was selected for evaluation because it is the most significant component of Project-related GHG emissions.

The air quality study calculated GHG emissions from mobile and stationary sources. The mobile source emissions were calculated by performing a yearly GHG emissions analysis to evaluate the changes in CO_2 emissions for the existing and future conditions within the study area. Similar to the mesoscale analysis for ozone, the year 2012 was selected as the future year of analysis because MEPA's policy requires that a project look five years into the future from the current year of analysis. The GHG emissions mobile source analysis traffic (volumes, delays, and speeds) and emission factor data were developed for four conditions:

- 2007 Existing;
- 2012 No-Build;
- 2012 Build; and
- 2012 Build with improvements/mitigation.

In addition to mobile sources, direct and indirect CO_2 emissions from the Project's proposed building sources were calculated using the computer-based EQUEST model.[5] Direct emissions included those emissions from the facility itself such as boilers, heaters, and internal combustion engines. Indirect emissions included CO_2 emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Total CO_2 emissions were determined by combining the CO_2 results from the mobile source analysis with the CO_2 emissions from the proposed direct and indirect building sources.

Mobile Source GHG Analysis

The GHG mobile source analysis was conducted following procedures similar to the ozone mesoscale analysis. The mobile source analysis estimated the area wide CO_2 emissions from vehicle traffic for a time period of one year. The change in CO_2 emissions from traffic were based on the average yearly traffic volumes, roadway lengths and vehicle emissions factors for existing trips, new trips, and new trips with roadway improvements for weekday and weekend conditions.

Mobile Source GHG Emission Rates

Currently MOBILE6.2 has a simple estimate of CO_2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts-specific conditions. A detailed presentation of the MOBILE6.2 input and output data are presented in the Appendix.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mesoscale analysis for CO_2 emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The traffic data used in the air quality study are presented in the Appendix. The detailed traffic analysis is presented in the Traffic section.

[5] EQUEST (the Quick Energy Simulation Tool), version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA

Stationary Source GHG Analysis

The Project will generate GHG emissions through the use of electricity and fossil fuels. The stationary source analysis calculated Project-related CO_2 emissions from these building sources, including boilers, heaters, and internal combustion engines, using the computer-based EQUEST model. While the Project is in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. The stationary source analysis calculated GHG emissions for two conditions: 2012 Build and 2012 Build with Improvements. The 2012 Build Condition represents the stationary source emissions that would occur if the Project were to be built using typical construction materials and rooftop equipment. The 2012 Build with Improvements Condition represents the Project emissions based upon the use of improved building materials and rooftop equipment.

Existing GHG Conditions

The calculation of 2007 Existing Condition mobile and stationary source emissions provides a base for which future years are evaluated. The mobile source analysis calculated the 2007 CO2 emissions from the major roadways in the study area. These emissions, estimated to be 120,663 tons/year, establish a baseline to which future emissions can be compared (Table 4-4 below).

The GHG analysis calculated the 2007 CO2 emissions for direct and indirect emissions from the existing stationary sources. Direct emissions included those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions included those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Under the 2007 Existing Condition, the CO2 emissions were estimated to be 885 tons per year, establishing a baseline to which future emission can be compared (Table 4-4).

Project Impacts

Future Project-related emission calculations are based upon changes in traffic and emission factor data as well as the Project's building sources. The traffic data includes traffic volumes, vehicle-miles-of-travel, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The Project's building sources included direct emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following section

reports the findings of the mobile source and stationary source analyses for the Project.

Mobile Source GHG Emissions Projections

The mobile source analysis estimated the future study area CO2 emissions due to the changes in traffic and emission data. Under the 2012 No-Build Condition CO2 emissions were estimated to be 130,759.0 tons per year (Table 4-4).

Under the 2012 Build Condition, the CO2 emissions were estimated to be 136,560.7 tons per year resulting in an increase of 5,801.7 tons per year from the No-Build Condition (Table 4-4). Under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 136,101.3 tons per year, which results in a decrease of 459 tons per year in CO2 emissions (representing an almost 8 percent decrease in the estimated emissions related to the Project). This reduction is due to the geometric and operational improvements of the study area roadways and the TDM program (refer to Chapter 3, *Transportation*).

Stationary Source GHG Projections

The stationary source analysis calculated 2012 No-Build, 2012 Build and 2012 Build with Improvements CO2 emissions for direct and indirect emissions from stationary sources (Table 4-4). Direct emissions included those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions included those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Under the 2012 No Build Condition, no changes to the stationary sources were assumed from the existing conditions; hence, the same CO2 emissions as in the 2007 Existing Condition were assumed, (estimated to be 884.6 tons per year). Under the 2012 Build Condition, the CO2 emissions were estimated to be 4,609.1 tons per year resulting in an estimated CO2 emissions of 3,724.5 tons per year (Table 4-4). Under the 2012 Build Condition with Improvements, the CO2 emissions were estimated to be 4,098.2 tons per year resulting in a decrease of 510.9 tons per year in CO2 emissions (an approximately 14 percent of reduction of the estimated Project-related emissions). This reduction is due to the building mitigation measures discussed below.

Table 4-4
CO2 Analysis Results with Improvements Condition (tons per year)

GHG Analysis	2007 Existing Conditions	2012 No-Build Conditions	2012 Build Conditions	Project-Related CO2 Emmission[2]	2012 Build w/ Improvements Conditions	CO2 Reductions Due to Project Improvements[3]
Mobile Source Analysis	120,663.4	130,759.0	136,560.7	5,801.7	136,101.3	-459.4
Direct /Indirect Stationary Source	884.6	884.6	4,609.1	3,724.5	4,098.2	-510.9
Total	121,548.0	131,643.6	141,169.8	9,526.2	140,199.5	-970.3

1 Represents the difference in CO_2 emissions between the Build and No-Build Conditions.
2 Represents the difference in CO_2 emissions between the Build with Improvements and the Build Conditions.

GHG Mitigation Measures

As part of MEPA's Policy, a "menu" of mitigation measures is provided for consideration by project proponents. A number of these measures are being considered and evaluated as part of the Project. Table 4-5 below provides a comprehensive list of mitigation measures as they relate to greenhouse gas emissions (some of which are being considered for the Project) and describes generally the benefits and limitations of these measures.

Table 4-5
Summary of Greenhouse Gas Emissions Mitigation Measures

Mitigation Measure	Benefits	Limitations
1 Site Design & Layout		
1.a Develop consistent with smart growth principles, including integrating transportation and land use.	Reduces transportation air quality impacts. Preserves open space. Walkability provides improved health.	Public transportation may be non-existent or have limited funds. Must be coupled with making public transit appealing/convenient.
1.b Minimize energy use through building orientation	A building's orientation with relation to the sun will impact heating and cooling, natural ventilation, and daylighting.	Site constraints, including environmental constraints or natural resources.
1.c Preserve open space and conserve/restore natural resources on-site	Reduces land and air quality impacts (indirect) from development activities. Preserves larger ecosystems.	Site constraints may limit preservation of open space or the ability to restore natural resources.
1.d Minimize building/development footprint	Reduces energy demand and other environmental impacts.	May not be preferred development program.
1.e Utilize Low Impact Development (LID) measures for stormwater management	A potential measure to reduce land and air quality impacts from construction activities (indirect) with less land altering means of stormwater management through more natural systems.	Not all LID measures are appropriate for all development sites.
1.f Design water efficient landscaping	Reduces or eliminates the use of potable water for irrigation and energy used for irrigation systems.	May not be preferred aesthetically.
2 Architectural Design/Treatments		
2.a Use high- reflective (high-albedo) roofing materials	Reduces heat island effect and air quality impacts through reduced cooling requirements.	Buildings in very cold climates may not experience year-round energy benefits and may increase heating costs.
2.b Maximize interior daylighting through floor plates, increased building perimeter and use of skylights and light wells	Reduces the need for electric lighting of building interiors, resulting in reduced energy use and air quality impacts. Can improve worker productivity and reduce absenteeism and illness.	Must carefully balance heat gain and loss, glare control, visual quality and variations of daylight availability. Sometimes requires modeling/computer simulation.
2.c Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance	Reduces energy demand through efficiency and, therefore, air quality impacts.	Costs
2.d Incorporate super insulation to minimize heat loss	Reduces the loss of heat and cooling.	Long-term environmental waste implications.
2.e Use recycled content/reused /regional building materials and products	Reduces natural resources and the energy associated with manufacturing new materials, shipping indirectly reducing air quality.	Availability of products may be limited.

Table 4-5 (cont.)
Summary of Greenhouse Gas Emissions Mitigation Measures

	Mitigation Measure	Benefits	Limitations
3	*Building Systems*		
3.a	Install high-efficiency HVAC systems	Limits the harmful environmental side effects of energy generation, distribution and consumption (i.e., pollution). Improve building comfort, while reducing operating costs.	Some energy-efficient measures may require additional upfront costs.
3.b	Eliminate use of chlorofluorocarbons (CFC)-based refrigerants in HVAC systems	Reduces damage to the protective ozone layer in the earth's upper atmosphere.	The use of CFC-based refrigerants has been phased out.
3.c	Do not use refrigerants or select refrigerants that do not emit pollutants contributing to ozone depletion and maintain those refrigerants	Minimizes the negative impacts of refrigerant use on ozone depletion and global warming.	May limit the types of HVAC systems available or require higher level of maintenance.
3.d	Reduce energy demand using peak shaving or load shifting strategies	Limits the harmful environmental side effects of energy generation, distribution and consumption (i.e., pollution). Improve building comfort, while reducing operating costs.	Some energy-efficient measures may require additional upfront costs.
3.e	Incorporate on-site renewable energy sources (e.g., solar, wind, geothermal)	Reduces dependence on fossil fuels and, therefore, reduces air quality impacts as a clean energy source. Provides for a more self-sufficient building with reduced energy costs.	May require upfront costs. Some technologies may not be cost effective.
3.f	Incorporate combined heat and power technologies	Reduces energy demand	Not efficient or effective in locations where the demand for hot water is low
3.g	Incorporate motion sensors and lighting and climate control	Reduces energy demand through efficiency and, therefore, air quality impacts.	Commonly employed in new office construction.
3.h	Incorporate water conserving fixtures	Saves energy to deliver and heat water.	Commonly employed in new construction.
3.i	Conduct building commissioning	Results in improved design and construction coordination.	Will result in increased soft costs and may require additional scheduling/coordination.
4	*Building Operations*		
4.1	Conduct ongoing measurement and verification (M&V) of systems, or ongoing building commissioning	Results in optimal building operation and cost savings in terms of energy performance. Minimizes long-term air quality/environmental impacts.	Cost to institute a M&V Plan is strongly tied to complexity of building systems.
4.2	Provide storage and collection of recyclables	Diverts a significant portion of solid waste stream from landfills. Could result in reduced disposal costs and generate revenue.	Must encourage occupants to change behavior. Space constraints may limit storage and collection area.
4.3	Purchase appliances, computers with lowest energy rating (such as Energy Star-rated)	Reduces energy demand	Requires additional costs

Table 4-5 (cont.)
Summary of Greenhouse Gas Emissions Mitigation Measures

	Mitigation Measure	Benefits	Limitations
5	*Alternative Transportation*		
5.1	Locate new buildings near public transportation and/or expand public transit onto or within walking distance	Reduces emissions and energy through the elimination of vehicle trips due to the option of alternative transportation.	Locations near public transit are not always available or appropriate.
5.2	Purchase alternative fuel and/or fuel efficient vehicles for fleet	The increased use of renewable and alternative fuels can result in significant reductions in air quality impacts from the use of petroleum-based fuels. By displacing petroleum fuels, many, although not all, of these fuels can provide reductions in greenhouse gas emissions.	To estimate the impacts of increases in renewable and alternative fuels on greenhouse gas emissions, the entire fuel lifecycle including fossil fuel extraction or feedstock growth, fuel production, distribution, and combustion should be accounted for.
5.3	Provide pedestrian and bicycle facilities on-site and connections off-site	Encourages alternative transportation and offsets air quality impacts from single-occupant vehicles.	Site constraints may limit the size/type of facilities.
5.4	Size parking capacity to meet, but not exceed, the local requirements and/or seek variance for reduced parking	Encourages employees to use alternative modes to travel to work	Alternative modes not always available or appropriate
5.5	Pursue opportunities for shared parking or banked parking	Encourages alternative transportation and offsets air quality impacts from single-occupant vehicles.	Requires coordination among different tenants
5.6	Parking management program, including preferential parking for carpool/vanpool or alternative fuel vehicles	Encourages alternative transportation and offsets air quality impacts from single-occupant vehicles.	May result in additional cost of staff to coordinate and manage
5.7	Implement Transportation Demand Management (TDM) measures to encourage alternative modes of transportation (e.g., posting of information, transit subsides, telecommuting/flex time)	Encourages alternative transportation and offsets air quality impacts from single-occupant vehicles.	May result in additional cost of staff to coordinate and manage
5.8	Roadway improvements to improve traffic flow	Reduces vehicle congestion and emissions	Requires additional costs
5.9	Provide no-idling truck zones at loading/off-loading	Meets State law requirements	Multiple signs may be needed to be visible
6	*Other*		
6.a	Develop design and construction sustainable guidelines	Allows tenant development to implement consistent building construction	Requires that project proponent maintain control of building construction
6.b	Use ultra-low sulfur diesel fuel for construction vehicles	Reduces temporary air quality impacts from construction vehicles.	May increase cost

Sources: MEPA Greenhouse Gas Emissions Policy and Protocol, Leadership in Energy and Environmental Design (LEED) New Construction Rating System, version 2.2.

As mentioned above, the EEA and MEPA draft GHG emissions policy encourages project proponents to identify and quantify measures that would reduce or minimize GHG emissions from mobile sources and direct and indirect stationary sources. The Proponent has developed physical and operational mitigation measures to be included in the Project. The following is a list of these mitigation measures (most of which were included in the air quality analysis where applicable). It should be noted that the majority of buildings for the Project will be built by future tenants. The Proponent will strongly encourage and incorporate (where feasible) these sustainable elements in order to reduce the Project-related impacts to GHG emissions.

Architectural Design/Treatments

- Use highly-reflective (high-albedo) roofing materials.
- Maximize interior daylighting through increased building perimeter and use of skylights and light wells.
- Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance.

Building Systems

- Incorporate super insulation to minimize heat loss.
- Use efficient, directed exterior lighting.
- Incorporate motion sensors and lighting and climate control.

Transportation Measures

In order to mitigate and reduce GHG impacts from Project-related mobile sources, the Proponent will implement physical and operational improvements to the roadways to reduce delays and queuing, as well as implement TDM measures in order to reduce single-occupant vehicle trips to the Project Site and to minimize peak-period traffic demands in the study area. Refer to Chapter 3, *Transportation* for a description of the proposed roadway and transportation improvements for the Project including the elements of the TDM program.

Conclusion

The air quality study demonstrates that the Project complies with the Clean Air Act Amendments (CAAA), the State Implementation Plan (SIP), and the Executive Office of Energy and Environmental Affairs (EEA) policy on Greenhouse Gas emissions. The ozone mesoscale analysis demonstrates that the Project will result in a minor increase of VOC and NOx emissions, as compared to the No-Build Condition. Consistent with the guidelines of the Massachusetts Department of Environmental Protection (DEP), the Project will incorporate reasonable and feasible mitigation measures to reduce VOC and NOx emissions. These mitigation measures include roadway improvements, traffic signal improvements and a TDM program. The implementation of these mitigation measures will help reduce the VOC and NOx emissions associated with the Project.

The microscale analysis evaluated Project-related impacts from vehicles traveling through congested intersections in the study area. This analysis demonstrates that all existing and future CO concentrations will be below the NAAQS criteria of 35 ppm and 9 ppm for 1-hour and 8-hour concentrations, respectively.

The GHG emissions analysis demonstrates that the Project meets the EEA draft policy on GHG emissions because it includes mobile and stationary source mitigation measures that will reduced the GHG emissions.

The air quality study demonstrates that the Project conforms to the CAAA, the SIP, and EEA GHG policy because:

- It will implement reasonable and feasible emission reduction mitigation measures;
- No new violation of the NAAQS will be created;
- No increase in the frequency or severity of any existing violations will occur; and
- No delay in attainment of any NAAQS will result.

#14216 - for GHGfile

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May 9, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY & ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME:	Proposed Retail Development, Route 20
PROJECT MUNICIPALITY:	Charlton
PROJECT WATERSHED:	French & Quinebaug
EOEA NUMBER:	14216
PROJECT PROPONENT:	Konover Development Corporation
DATE NOTICED IN MONITOR:	April 9, 2008

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and Section 11.03 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of an Environmental Impact Report (EIR).

Project Description

As described in the Environmental Notification Form (ENF), the project consists of a proposed retail development along Route 20 (Worcester Road) in Charlton, MA. The project will result in the development of an approximately 97 acre parcel located on the north site of Route 20 and west of Center Depot Road (the "north parcel") and an approximately 23 acre parcel located south of Route 20 and west of North Main Street (the "south parcel").

The majority of the project site currently consists of wooded areas and former agricultural fields which have not been actively cultivated for approximately 20 years. One residence is currently located on the north parcel, and five residences are currently located on the south parcel. An existing, inactive standpipe water tank is also located on the north parcel. The project site is served by public water, sewer and electric utilities and is currently zoned for Community-Business (CB) use.

The project will consist of a commercial retail center that includes the construction of 17 retail stores on the north and south parcels. The Proponent envisions that the development will consist of approximately 700,000 square feet (sf) of commercial retail space, including a mix of retail stores, banks and restaurants, in addition to associated driveways, parking areas and other infrastructure. At the MEPA site visit held for the project on April 17, 2008, the Proponent indicated that the project may include a home improvement store, a supermarket, and/or a movie theater. Up to 14 retail stores, ranging in size from approximately 2,900 to 154,440 sf are proposed for the north parcel. The proposed development for the south parcel includes an approximately 133,575 sf retail store and an approximately 5,500 sf restaurant. The project will be developed in three phases. The first two phases will consist of development of the north parcel, while the south parcel will be developed in the third phase.

Jurisdiction and Permitting

The project is undergoing review and requires the preparation of an EIR pursuant to the following sections of the MEPA regulations: 301 CMR 11.03(1)(a)(1) because it will result in the direct alteration of more than 50 acres of land; 301 CMR 11.03(1)(a)(2) because it will result in the creation of more than 10 acres of new impervious surface; 301 CMR 11.03(6)(a)(6) because it will result in the generation of more than 3,000 new average daily trips (adt); and 301 CMR 11.03(6)(a)(7) because it will require the construction of more than 1,000 new parking spaces.

The project requires the following permits and/or review: a National Pollutant Discharge and Elimination System (NPDES) Construction General Permit from the U.S. Environmental Protection Agency (EPA); a Sewer Connection Compliance Certification from the Department of Environmental Protection (MassDEP); an Access Permit from the Massachusetts Highway Department (MassHighway); Site Plan Review from the Charlton Planning Board; and an Order of Conditions from the Charlton Conservation Commission. The project also requires the preparation of a mesoscale air quality analysis and is subject to the MEPA Greenhouse Gas Policy.

Because the Proponent is not seeking financial assistance from the Commonwealth for the project, MEPA jurisdiction extends to those aspects of the project that may cause significant Damage to the Environment and that are within the subject matter of required or potentially required state permits. In this case, MEPA jurisdiction extends to land alteration, stormwater, wetlands, and transportation.

SCOPE

General

As modified by this Certificate, the Proponent should prepare the Draft EIR (DEIR) in accordance with the general guidelines for outline and content found in Section 11.07 of the

MEPA regulations. The DEIR should include an existing conditions plan delineating resources and abutting land uses for the entire project area and a proposed conditions plan (or plans) that include all proposed structures. Plans should be provided at a reasonable scale (e.g. 40 or 60 scale). The DEIR should identify and describe any project phasing.

The DEIR should include a copy of this Certificate and of each comment received. In order to ensure that the issues raised by commenters are addressed, the DEIR should include a response to comments. This directive is not intended to, and shall not be construed to, enlarge the scope of the DEIR beyond what has been expressly identified in this Certificate.

The Proponent should circulate the DEIR in accordance with Section 11.01(1) of the MEPA regulations; to those who commented on the ENF; to municipal officials in the Town of Charlton; and to any state and federal agencies from which the Proponent will potentially seek permits or approvals. In addition, copies of the DEIR should be made available at the Charlton public library.

Permitting and Consistency

The DEIR should include a brief description of each state permit or agency action required or potentially required, and should demonstrate that the project will meet applicable performance standards. The DEIR should contain sufficient information to allow the permitting agencies to understand the environmental consequences of their official actions related to the project.

The Proponent should clarify whether a Distribution System Modification Permit (BRP WS 32 or 33) will be required from MassDEP. If so, the DEIR should respond to MassDEP's comments on the ENF regarding water supply for the project. If municipal water is not available for the project, the Proponent should discuss how it will supply potable, fire protection and irrigation water to the project, and should outline how the project would comply with the Massachusetts Drinking Water Program regulations at 310 CMR 22.00.

In accordance with Executive Order No. 385, "Planning for Growth" and Section 11.03 (3)(a) of the MEPA regulations, the DEIR should discuss the consistency of the project with local and regional growth management and open space plans. The DEIR should also discuss the consistency of project design with any applicable state policies, including the Commonwealth's Sustainable Development Principles. The Proponent should also provide an update on the local permitting process for the project.

In response to concerns raised at the MEPA site visit for the project and in comments submitted by the Charlton Planning Board, I encourage the Proponent to provide a discussion of potential noise impacts and mitigation in the DEIR.

Alternatives

The DEIR should evaluate site design alternatives and measures that avoid, minimize or

mitigate the environmental impacts associated with impervious surface, stormwater, wetlands and traffic to the maximum extent feasible. In addition to the No-Build Alternative and the Preferred Alternative, the Proponent should consider the following:

- The Proponent proposes to construct approximately 2,937 surface parking spaces for the project. The DEIR should explain how the number of parking spaces needed was determined. If the parking supply is greater than the amount required under local zoning, the DEIR should explain why, and should examine the feasibility of an alternative with fewer spaces. Parking demand management should be a key component of the overall mitigation analysis.
- The project will be required to comply with MassDEP's recently revised Stormwater Management Standards (January 2008). Pursuant to the revised stormwater regulations, the Proponent must consider environmentally sensitive site design and LID development techniques to manage stormwater. The DEIR should include an analysis of opportunities for recharge of runoff from impervious areas both from rooftops and other areas; improved source control of runoff throughout the site; and better control of pollutants of concern (especially sediments, nutrients, metals and petroleum-based pollutants). The Proponent should examine the use of porous pavement in lower use parking areas, as well as the creation of rain gardens in parking lot islands and at lot edges for stormwater management and infiltration.
- Comments from the Executive Office of Transportation (EOT) indicate that a proposed signalized main access to both sites from Route 20 may not be possible. As outlined in more detail in this Certificate below, the Proponent should consult with EOT on this matter and if necessary provide an alternative in the DEIR in which site access is provided via Center Depot Road and North Main Street.
- The project is anticipated to result in impacts to 4,120 sf of BVW associated with the construction of the access driveway from Route 20 to the south parcel. The Proponent should examine alternative site layouts and measures to reduce wetland impacts.

For each alternative, the DEIR should quantify the amount of land altered, the amount of earth work involved in meeting final grades, the amount of impervious surfaces created and any wetland impacts. The DEIR should explain any trade-offs inherent in the alternatives analysis, such as increased impacts on some resources to avoid impacts to other resources.

Land Alteration/Drainage

According to the ENF, the project's stormwater management system will feature a combination of traditional and Low Impact Development (LID) stormwater Best Management Practices (BMPs) including below-ground detention, underground infiltration, stormwater basins and hydrodynamic separators. The DEIR should include a detailed drainage plan and outline of the stormwater management system that identifies stormwater discharge points, and describes any drainage impacts associated with required off-site roadway improvements. The DEIR should provide drainage calculations, pre- and post-construction run off rates and a detailed description of BMPs.

Details concerning the assumptions used in designing the stormwater system and

sufficient information to demonstrate that the system meets the requirements of MassDEP's revised Stormwater Management Standards (January 2008) should be included in the DEIR. The proposed stormwater management plan should feature decentralized systems that involve the placement of a number of small treatment and infiltration devices located close to the various impervious surfaces that generate stormwater runoff in place of a centralized system comprised of closed pipes that direct all the drainage from the entire site into one large dry detention basin.

The DEIR should also describe the operations and maintenance program for the drainage system to ensure its effectiveness including a schedule for maintenance and identification of responsible parties. The maintenance program should outline the actual maintenance operations, sweeping schedule, snow removal and de-icing policies, responsible parties, and back-up systems.

Wetlands

Wetlands on the project site include Bordering Vegetated Wetlands (BVW) on the north and south parcels. The total acreage of BVW on the project site is approximately 12 acres. An area of isolated land subject to flooding (approximately 0.44 acres) is located on the eastern portion of the south parcel. The Charlton Conservation Commission has issued an Order of Resource Area Delineation (ORAD), which verified the wetland resource area boundaries at the site.

The development of the north parcel will not result in any direct impacts to wetland resources, however some construction activities are proposed within the 100-foot buffer zone to resource areas. The project is anticipated to result in impacts to 4,120 sf of BVW associated with the construction of the access driveway from Route 20 to the south parcel. In the DEIR, the Proponent should examine measures to avoid or minimize impacts associated with the access drive through the use of a raised crossing, retaining walls or other modifications.

The Proponent should submit plans with the DEIR that clearly delineate wetlands on the project site. The DEIR should quantify the project's estimated impact on each resource area. It should describe the nature of all likely impacts that cannot be avoided, including crossings, grading, overstory clearing and construction-related disturbances and whether they are temporary or permanent in nature. The Proponent should explain how the project would comply with the performance standards in the wetlands regulations and demonstrate that the alteration of resource areas has been avoided and minimized.

The Proponent states in the ENF that BVW impacts on the south parcel will be mitigated through the creation of an on-site wetland replication area. The Proponent should identify the proposed site for wetland replication. Typically, MassDEP recommends wetlands replication at a ratio of 2:1. A detailed wetlands replication plan should be provided which, at a minimum, should include: replication location(s); elevations; typical cross sections; test pits or soil boring logs; groundwater elevations; the hydrology of areas to be altered and replicated; list of wetlands plant species of areas to be altered and the proposed wetland replication species; planned construction sequence; and a discussion of the required performance standards and long-term

monitoring.

Transportation

The project is anticipated to generate 28,141 new adt on a weekday and 37,346 adt on a Saturday. The Proponent submitted a traffic impact and access study (TIAS) with the ENF. The DEIR should include an updated TIAS prepared in conformance with the Executive Office of Energy and Environmental Affairs/Executive Office of Transportation (EEA/EOT) Guidelines for EIR/EIS Traffic Impact Assessments. As outlined in comments from EOT, the scope of the traffic study should be expanded to include the following state highway locations:

- The Route 20/Route 169 intersection;
- The Route 20/Stafford Street/Carpenter Hill Road intersection;
- The Route 20/Carroll Hill Road/Old Worcester Road intersection; and,
- The Route 20/Richardson Corner Road/Oxbow Road intersection.

The DEIR should present capacity analyses and a summary of average and 95th percentile vehicle queues for each intersection within the study area. The Proponent should clarify the assumption in the TIAS that the average annual daily traffic volume on Route 20 decreased in the period between 2001 and 2004.

Site access will be provided by three driveways for the north site and two driveways for the south site. The main driveway for the north and south sites is proposed to be located on Route 20 at a new signalized intersection, approximately 1,000 feet west of the signalized intersection at Center Depot Road. A minor site access for the north parcel will also be developed off Center Depot Road/North Main Street to accommodate customer traffic oriented to and from the north and south and to reduce traffic impacts to Route 20. This driveway will be stop sign controlled, providing right and left turning lanes. The proposed third driveway for the north site will be located on Route 20, approximately 500 feet west of Center Depot Road and North Main Street. This driveway will only allow right turns to and from Route 20 westbound. The proposed second driveway for the south site will be located on North Main Street, approximately 350 feet south of the intersection with Route 20. This driveway will be stop sign controlled, providing exclusive right and left turning lanes.

The TIAS submitted with the ENF indicates that all study area intersections are expected to operate at Level of Service (LOS) C or better in the Build condition with the exception of the intersection of Route 20 at North Main Street/Center Depot Road and the intersection of North Main Street at Route 31. The Proponent has proposed the following improvements to mitigate project-generated traffic:

- Construct a new signal at the proposed main site driveway;
- Widen Route 20 to provide eastbound and westbound right turn lanes at the site driveway intersection. A single westbound and double eastbound left turn is also proposed at this intersection;
- Construct all three site driveways to provide two exiting lanes;

- Construct channelized right turn lanes on the northbound and southbound site driveway approaches to Route 20;
- Widen Center Depot Road to provide an exclusive northbound left turn storage lane at the proposed northeast site driveway;
- Widen Center Depot road at the intersection with Route 20 to provide a second southbound left turn lane;
- Widen North Main Street to provide an exclusive northbound right turn lane;
- Modify signal timing and phasing at the intersection of Route 20 at North Main Street and Center Depot Road to provide protected northbound and southbound left turn phases; and,
- Conduct signal warrant analyses for the intersection of North Main Street at Route 31 and Old Worcester Road.

In its comments on the ENF, EOT has stated that it cannot support a traffic signal at the proposed main site driveway because access to the north side of the development can be provided from Center Depot Road and access to the south parcel can be provided from North Main Street. The Proponent should consult with EOT and MassHighway District 3 regarding access to the site in advance of submitting the DEIR. If the Proponent is unable to provide a signalized access to both sites from Route 20 as proposed in the ENF, the DEIR should present a revised site layout with the primary access points on Center Depot Road and North Main Street. The Proponent should outline any additional local approvals that would be required for the revised site plan. The TIAS should be updated to reflect the different access and exit movements at the site and the Proponent should outline necessary mitigation at the Route 20/Center Depot Road/North Main Street intersection to accommodate the site traffic.

The DEIR should include conceptual plans for the proposed roadway improvements that should be of sufficient detail to verify the feasibility of constructing such improvements. The conceptual plans should clearly show proposed lane widths and offsets, layout lines and jurisdictions, and the land uses (including access drives) adjacent to areas where improvement are proposed. Any mitigation within the state highway layout must conform to MassHighway standards, including but not limited to, provisions for lane, median and shoulder widths, and bicycle lanes and sidewalks.

Pedestrian, Bicycle and Transit Connections

As outlined in the ENF, the local and state roadways in the vicinity of the project site do not provide any pedestrian or bicycle transportation facilities. The Proponent should outline in the DEIR what pedestrian and bicycle accommodations will be provided at the project. The Proponent should commit to providing pedestrian signal and sidewalk facilities as appropriate to facilitate pedestrian connections within and between the two adjacent project parcels.

The Town of Charlton is currently not served by public transit service. The Proponent should work with the Worcester Regional Transit Authority (WRTA) or other private shuttle service providers to expand transit linkage between the project site and Worcester or other viable population centers within the region. The project should include transit friendly design features to accommodate possible future public transportation expansion.

Transportation Demand Management

The DEIR should include a comprehensive Transportation Demand Management (TDM) program that investigates all feasible measures aimed at reducing site trip generation. The TDM program should identify measures and incentives to encourage the use of alternative modes such as transit, walking, and bicycling. The TDM plan should include specific measures that have been successful in reducing trip generation for retail establishments. The Proponent should note suggested measures outlined by MassDEP in their comments. The Proponent should provide clear commitment to implement and continuously fund any evaluated TDM measures deemed feasible to sustain and/or increase mode usage over time to ensure a balanced and functional transportation system along the corridor. The DEIR should also discuss whether the project will require compliance with MassDEP's Ridesharing Regulation (310 CMR 7.16).

Air Quality

The projected vehicle trips from the project triggers MassDEP's requirement that the proponent conduct an air quality mesoscale analysis to determine if the proposed project will increase the amount of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the project area and to assess the project's consistency with the Massachusetts State Implementation Plan (SIP). The Proponent should consult with MassDEP regarding modeling protocol prior to conducting the analysis. If the analysis indicates an increase in VOC and NOx emissions, the Proponent must develop mitigation measures to offset the increase. The results of the analysis and a description of any required mitigation should be submitted with the DEIR. The DEIR should also address DEP's comments related to idling, delivery restrictions, and construction period air quality.

Greenhouse Gas Policy

The project is subject to EEA's Greenhouse Gas (GHG) Emissions Policy and Protocol, and the DEIR must demonstrate consistency with the analysis and mitigation provisions therein. The Policy is available at http://www.mass.gov/envir/mepa/pdffiles/misc/GHG%20Policy%20FINAL.pdf.

The Proponent should calculate GHG emissions from both mobile sources and direct and indirect stationary sources. The Proponent should compare GHG emissions associated with: 1) a code-compliant baseline (the sum of direct emissions from stationary sources and indirect emissions from energy consumption and transportation); 2) the preferred alternative (the sum of direct emissions from stationary sources, indirect emissions from energy consumption, and transportation for the project as proposed in the ENF); and 3) project alternatives with greater GHG emissions-related mitigation than the preferred alternative. The Proponent should note that it is required to quantify mitigation benefits.

The Appendix to the Policy contains a partial, non-exhaustive list of measures to reduce GHG emissions. MassDEP has also provided an extensive list of possible GHG-reduction strategies in its comment letter on the ENF. When comparing the preferred alternative to other

alternatives with greater GHG reduction, the Proponent should explain which alternatives were rejected, and the reasons for rejecting them. The Proponent has requested a meeting with the MEPA office to discuss potential GHG reduction measures appropriate to the proposed project. The DEIR should reflect an analysis of mitigation measures discussed at that meeting. The Proponent should evaluate the use of combined heat and power (CHP), solar or geothermal power on site to generate energy for the project.

The Proponent should clarify how the proposed project will function and outline how much of the actual project it will construct and manage, how much will be completed by tenants, and how much control the Proponent will have over what tenants build. The Proponent should clarify in the DEIR the responsible party for specific mitigation measures, how and when mitigation will be implemented, and how the success of mitigation measures will be monitored.

Construction Period Impacts

The DEIR should include a discussion of construction phasing, evaluate potential impacts associated with construction activities and propose feasible measures to avoid or eliminate these impacts. I encourage the Proponent to consider participating in the Massachusetts Diesel Retrofit Program, consisting of an engine retrofit program and/or use of low sulfur fuel to reduce exposure to diesel exhaust fumes and particulate emissions during construction. An overview of the program can be viewed here: http://www.mass.gov/dep/air/diesel/conretro.pdf

Mitigation

The DEIR should contain a separate chapter on mitigation measures. It should include a Draft Section 61 Finding for all state permits that includes a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation, and the identification of the parties responsible for implementing the mitigation. The DEIR should provide a schedule for the implementation of the mitigation, based on the construction phases of the project.

May 9, 2008
Date

Ian A. Bowles

Comments received:

4/16/2008	Arnold Burlingame
4/24/2008	Town of Charlton, Planning Board
4/28/2008	Peter Cutting
4/28/2008	Central Massachusetts Regional Planning Commission
4/29/2008	Executive Office of Transportation

4/30/2008 Department of Environmental Protection, Central Regional Office

IAB/BA/ba

BA

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Central Regional Office, 627 Main Street, Worcester, MA 01608

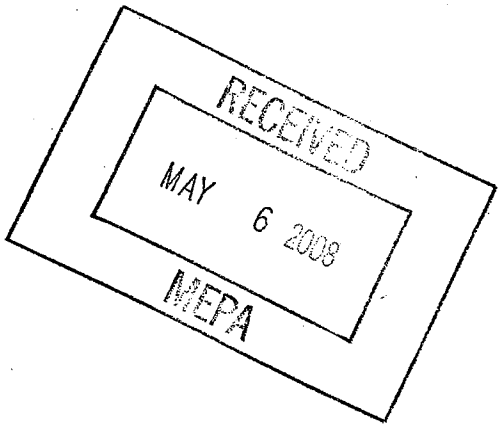
DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

April 30, 2008



Secretary Ian A. Bowles
Executive Office of Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114

Attention: MEPA Unit – Briony Angus

Re: Environmental Notification Form (ENF)
Proposed Retail Development, Route 20
Charlton
EEA # 14216

Dear Secretary Bowles,

The Massachusetts Department of Environmental Protection's (MassDEP) Central Regional Office (CERO) has reviewed the ENF for Proposed Retail Development, Route 20 in Charlton. The project involves a proposed commercial retail development along Route 20 (Worcester Road) in Charlton. The project site includes an approximately 97-acre parcel located on the north side of Route 20 and west of Center Depot Road and an approximately 23-acre parcel located south of Route 20 and west of North Main Street. Approximately 700,000 square feet (sf) of mixed commercial retail space is proposed, including stores, banks and restaurants. The project exceeds Mandatory Environmental Impact Report (EIR) thresholds related to land alteration, impervious area, traffic and parking. The project will require an Access Permit from MassHighway, a Sewer Connection Compliance Certificate from MassDEP, Site Plan Review from the Charlton Planning Board, and an Order of Conditions from the Charlton Conservation Commission. The project is also subject to EEA's Greenhouse Gas Policy.

MassDEP offers the following comments on the ENF:

Water Supply

- The Proponent has indicated in the above MEPA document that water for the proposed project will be supplied through the Town of Charlton municipal water supply system

via existing infrastructure along the Route 20 Corridor and a Town owned water tank on site. The water supply system is currently dry, but will be filled and pressurized as part of a water improvement project currently under way. The proponent also states that the developer is in contact with the Charlton Sewer and Water Commission to reserve the appropriate betterments for the site. The drinking water needs for the proposed project have been projected to be 41,500 gallons per day. This amount is less than the projected wastewater use. The proponent needs to provide the basis for the derivation of the drinking water needs 41,500-gpd and explain the difference from the projected wastewater flow.

- MassDEP is aware that the Town of Charlton, through the Charlton Water & Sewer Commission has proposed public water system interconnection improvements. The proposed interconnection and water system improvements project will allow the Town of Southbridge public water system (PWS ID # 2278000) to supply water to a portion of Town of Charlton that has experienced contamination of private wells. This project involves supplying approximately 100,000 gallons per day of water from Southbridge public water system to the existing Charlton distribution system. MassDEP believes that the contaminated properties and other properties have already been on the priority list for the 100,000-gallon per day capacity. Unless the Town of Charlton is able to find additional capacity with an in town source of water or through another inter-municipal agreement the proposed Charlton public water system will not have any excess water capacity available to supply the proposed retail development project.

- If Town of Charlton were to obtain additional water supply capacity, MassDEP requires that the Proponent submit documentation from the Town of Charlton that they have adequate hydraulic capacity to provide safe drinking water to the proposed project area at the anticipated post development demand flow, while maintaining compliance with Public Water System's Water Management Registration and/or Permit requirements.

- The Proponent should also be aware that submittal of a Distribution System Modification permit application BRP WS 32 or BRP WS 33, as applicable, may be required for MassDEP review and approval for any distribution system including water main extensions, storage tank construction, booster pump construction, and other appurtenant structures, etc. A registered Massachusetts Professional Engineer must stamp all plans and specifications submitted to MassDEP.

- If Town of Charlton municipal water is not available for the proposed retail development, the proponent should be aware that all proposed potable sources of water supply that will serve an average of at least 25 persons per day, 60 or more days per year are subject to, and must meet the requirements of 310 CMR 22.00 Massachusetts Drinking Water Program Regulations, and the "Guidelines and Policies for Public Water Systems" (the Guidelines). Accordingly, the proposed development would be considered a public water system, and thus needs to go through MassDEP's "New Source Approval" permitting process.

- If on-site wells are proposed, a hydrogeological analysis that demonstrates sufficient supply without adverse impacts to other water resources must be included in the report. The proposed well site shall meet Zone I requirements, including ownership and/or control and prohibited land use restrictions and activities. Please be aware that all activities unrelated to the operation of the public water system must be located outside of the 100 to 400 foot Zone I protective radius of the well, and must be addressed as part of MassDEP's New Source Approval permitting process. Activities such as, but not limited to, vehicles, buildings, parking lots, roadways, fuel storage, hazardous waste storage, salt storage, floor drains, septic systems, picnic areas and other areas of concentrated human activity would not be allowed within the Zone I radius of the well. Prior to commencement of the development of a new public water source, the proponent should conduct a thorough analysis of system demand and have a viable water conservation program in place. Conservation should include the full range of water supply conservation, demand management, and water reuse activities and devices.

Wetlands

The project is proposed to be developed in three phases:

- Phases I & II – North Parcel: There are no direct impacts (filling/altering) to any wetland resource areas associated with the development of the north side of the project. However, construction activities are proposed within the 100-foot buffer zone to wetland resource areas. A Notice of Intent will be filed with the Charlton Conservation Commission/MassDEP and a Final Order of Conditions obtained.

- Phase III – South Parcel: Approximately 4,120 sf of bordering vegetated wetland impacts are associated with the construction of an access driveway from Route 20 to the South Parcel. This impact will be mitigated through on-site wetland replication. A Notice of Intent will be filed with the Charlton Conservation Commission/MassDEP and a Final Order of Conditions obtained. The proposed stormwater management system has been designed to comply with the Massachusetts Stormwater Management Standards.

  It appears that the 4,120 sf of bordering vegetated wetland impacts associated with the construction of an access driveway from Route 20 to the South Parcel may either be avoided or at least minimized through driveway realignment or other design modifications – retaining walls, etc. The proponent must demonstrate to the issuing authority that they have evaluated options to avoid and minimize filling/alteration of bordering vegetated wetlands.

  The proponent is required to demonstrate that the projects stormwater management system has been designed in accordance with the revised Stormwater Management Standards and the newly promulgated regulations that took effect January 2, 2008.

Wastewater

The proposed design flow for the three-phase development is 47,000 gallons per day (gpd) at completion. Since the ultimate design flow is less than 50,000 gpd, the proponent does not need to obtain a connection permit from the Department prior to construction. Instead, the proponent

must obtain local sewer connection permit and then must file a one-time certification signed by the local authority with MassDEP within 60 days after the connection starts to be used.

- The proponent needs to provide the basis for the derivation of the wastewater flow quantity of 47,000-gpd.

The proponent states in the Project Description, "The Charlton Sewer and Water Commission are currently undertaking projects which will increase the available water and sewer capacity in town."

- Under its current NPDES permit, Charlton is authorized to discharge 450,000 gpd from its POTW. In a 4/10/08 discussion the Charlton Sewer and Water Commission Administrator stated that the current average flow at the plant is approximately 200,000 gpd, and that the remaining capacity of 250,000 gpd has been allocated to existing assessed betterments. Based on this discussion it appears that the proponent has not yet obtained local approval to connect the proposed development. Unless the proponent can obtain a commitment from Charlton for this flow capacity, it should investigate the feasibility of on-site disposal alternatives.

The proponent states that the project is characterized as a sewer connection.

- Since the project consists of the construction of multiple buildings a network of sewers will be need to be constructed. The Town needs to ensure through the local permitting process that the developer has a formal operation and maintenance plan for the private sewer system in-place prior to the connection of the Project to the municipal sewer system. The local authority must ensure that the sewers and any pump stations are designed in accordance with recommended guidelines specified in TR-16 and with MassDEP watertight construction policies. We recommend that food preparation establishment be equipped with an external in-ground grease interceptor on the kitchen line, and that pump stations be equipped with alarms and back-up power.

Transportation

Mobile Source Greenhouse Gas Analysis

- The proposed project is a large retail development consisting of seventeen retail stores and restaurants totaling 700,000 sf with 2,937 parking spaces. The proposed retail development will generate an estimated 28,200 new vehicle trips (Saturday Average Daily Traffic). The proposed project site contains two adjacent parcels of undeveloped land and is bisected by Route 20.

Requirements

Mesoscale Analysis

- The significant number of projected new daily vehicle trips triggers MassDEP's review threshold that requires an air quality mesoscale analysis comparing the Build and No Build conditions. The DEIR should include the mesoscale analysis. The project proponent should consult with MassDEP regarding modeling protocol prior to conducting

this analysis. The current emission model, EPA's MOBILE 6.2, should be used for this effort.

The purpose of the mesoscale analysis is to determine whether and to what extent the proposed project will increase the amount of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the project area. The mesoscale analysis will also be used to determine if the project will be consistent with the Massachusetts State Implementation Plan (SIP). Emission increases due to the project must be mitigated and any subsequent environmental impact analysis should include the project proponent's commitment to implement said mitigation measures.

For the purpose of determining traffic impacts and site access evaluations, the project proponent must conduct an analysis of all roadway segments affected by the project, typically an area within a 0.3 to 16 km radius of the project. The project study area established for the traffic analysis provided with the ENF encompasses an area approximately one mile around the project site and includes major intersections with Route 20. The exact geographical area for the analysis depends on local conditions and the impact of the project on area travel patterns. The area should be large enough to include all roadway links that could experience a 10% potential increase in traffic and which currently operate at or, will be degraded to, a Level of Service (LOS) D or lower. The project proponent should identify the proposed boundaries of each of the project alternatives, including the Existing condition in the Base Year, and the No-Build and Build conditions at the project completion and project design years as appropriate. The project proponent has identified the Build Year as 2012.

VOC and NOx emissions for the Existing condition can be estimated using existing characteristics on the roadway segments. Emissions in the Build and No-Build conditions can be estimated by changing the traffic characteristics on the roadway segments to those conditions that are expected to occur when the entire project is completed.

If the mesoscale analysis of the Build condition compared with the No-Build condition indicates that the proposed project will result in an increase in VOC and NOx emissions, then the project proponent must demonstrate a good faith effort to develop, implement, or fund adequate mitigation measures to offset these increases to the maximum extent possible. The mitigation measures may include project appropriate Transportation Demand Management (TDM) measures and/or other project specific measures.

Greenhouse Gas Analysis

- The DEIR should also include a Greenhouse Gas (GHG) Analysis. The mesoscale analysis can be used to estimate the mobile source carbon dioxide (CO2) emissions associated with the additional vehicle trips using updated emissions data. The analysis should compare CO2 emissions for the following conditions; the existing 2008 baseline, the 2012 No-Build, the 2012 Build, and the 2012 Build with Improvements.

Recent GHG analyses of mixed use developments have estimated their respective TDM programs to account for approximately 10% of the their overall mobile source CO2 reductions. While the retail uses of the proposed project may not achieve the same level

of reductions, MassDEP believes that an appropriate TDM package designed for a large retail environment could reduce ADT with corresponding decreases in VOC, NOx, and CO2 emissions. In an effort to yield additional emission reductions, MassDEP recommends the following additional measures.

Recommendations

MassDEP advises the project proponent take advantage of the following measures to reduce the emissions impact of the project on the air quality in the area.

Delivery Restrictions

- MassDEP recommends that the proponent restrict truck deliveries to the retail complex to off-peak hours to minimize traffic impacts and diesel emissions in the project area.

Construction Period Air Quality Mitigation Measures

- MassDEP recommends that project proponents and contractors install after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). MassDEP commends the project proponent for committing to installing these devices to reduce engine emissions. MassDEP's guidance document, "Diesel Engine Retrofits in the Construction Industry – A How to Guide", is available on MassDEP's website at http://www.mass.gov/dep/air/diesel/conretro.doc.

In addition, the project proponent stated that it would require contractors and subcontractors to use either low sulfur diesel (LSD) fuel or ultra low sulfur diesel (ULSD) fuel. LSD fuel, which has a sulfur content of 500 parts per million (ppm), is currently required for off-road engines under federal regulation. ULSD fuel, with a sulfur content of 15 ppm, will be required for off-road engines in 2010. However, because of the current availability of ULSD, MassDEP recommends the early use of ULSD fuel to reduce additional amounts of fine particulate matter, which is associated with the state's high incidence of asthma and is a probable carcinogen.

Transportation Demand Management (TDM) Measures

The project proponent should also consider implementing the following measures to further reduce vehicle trips within the project study area:

- On-Site Vehicle Trip Reduction Coordinator; MassDEP recommends that the proponent designate an on-site vehicle trip reduction coordinator to implement, promote and follow up on the use of the mitigation trip reduction measures. The coordinator should work with all tenant employees and patrons.

- Commuter Tax Benefit Program; This transportation tax benefit program encourages employees to take transit or vanpools to work, providing transit and bus services are available within a mile of the project site. This program provides the added benefit of decreasing taxes for employers and employees.

- Transit Options; **MassDEP** recognizes that the proposed project site is located in a sparsely developed geographic area and is not currently served by transit. MassDEP recommends that the proponent work with the Worcester Regional Transit Authority or

other private shuttle service providers to expand transit linkage between the project site and Worcester or other viable population centers within the region.

- Rideshare-Matching Program: MassDEP recommends that the proponent establish a rideshare-matching program to match employees in carpools and/or vanpools. The proponent could also enlist the services of a third-party provider to carry out this program.

- Form or Join an Existing Transportation Management Association (TMA): TMAs are organizations that help several employers in a local area develop and implement incentives that reduce traffic and trips to the worksite. Employers pay a fee for this service to a centralized coordinator to market and implement these incentives on their behalf.

- Guaranteed Ride Home Program: MassDEP recommends that the proponent establish an emergency ride home program for all project employees who travel by carpools/vanpools.

- Preferential Parking: MassDEP recommends that the proponent designate special, preferred parking spaces for carpools and/or vanpools as an incentive to encourage both employees and patrons to rideshare to the retail development.

- Bicycle Incentives: To increase bicycle usage to the project site, MassDEP recommends that the proponent install adequate locker and shower facilities, and secure bicycle storage for employees of store tenants. Secure bicycle racks in adequate number and on-site distribution should be provided and made available to all store patrons.

- Pedestrian Incentives: MassDEP recommends that the proponent coordinate with MHD through the site traffic impact assessment process to integrate a pedestrian activated signal option into the proposed signalized site access intersection at Route 20. The project should provide the pedestrian signal and sidewalk facilities as appropriate to facilitate pedestrian access within and between the two adjacent project parcels.

- Traffic Calming: Traffic calming measures in excess of jurisdiction requirements provide motor vehicle speed reduction and encourage bicycle and pedestrian trips. All sidewalks within or adjacent to a project should be a minimum of 5' wide with vertical curbing and avoid acute angle intersections. All intersections within or adjacent to a project should feature one or more of the following traffic calming design techniques: marked crosswalks, count-down signal timers, curb extensions, speed tables, raised crosswalks, raised intersections, median islands, tight corner radii, and round-abouts. Streets internal and adjacent to the project feature pedestrian, safety/traffic calming measures such as on-street parking, planter strips and street trees and chicanes (variations in road width) to discourage high-speed travel.

The project proponent should also consider the additional measures listed on page 10 of MEPA's Greenhouse Gas Emissions Policy and Protocol. In addition to these recommendations, MassDEP reminds the proponent of the following requirements.

Required Additional Measures

Compliance with the Massachusetts Idling Regulation

- The Massachusetts Idling regulation (310 CMR 7.11) prohibits motor vehicles from idling their engines more than five minutes unless the idling is necessary to service the vehicle or to operate engine-assisted power equipment (such as refrigeration units) or other associated power. The proponent should post idling restriction signs in all loading and drop-off areas within the site to remind all drivers, patrons, and delivery personnel of the state's idling regulation. Questions regarding this regulation should be directed to Julie Ross of MassDEP at 617-292-5958.

Compliance with the Massachusetts Rideshare Regulation

- MassDEP implements the Rideshare Regulation (310 CMR 7.16), a clean air program that applies to employers with 250 or more daily employees which may or not affect future tenants of this project. Employers subject to the Rideshare Program must implement a series of incentives that are designed to reduce the number of trips made by employees who drive alone to work. To date, employers with 1,000 or more employees and employers with 250 or more employees that are also subject to the Air Operating Permit Program (as detailed in MassDEP regulation, 310 CMR 7.00, Appendix C) must comply with the Rideshare regulation. Questions regarding this regulation should be directed to MassDEP's Rideshare Helpline at 617-292-5663 for assistance in complying with this air quality program.

Greenhouse Gas Emissions

- This project is categorically included for the preparation of an EIR and requires a Massachusetts Highway Department (MHD) access permit and is, therefore, subject to the MEPA Greenhouse Gas Emissions Policy and Protocol. The ENF does not, however, reference the policy or apply its principles by quantifying the direct and indirect emissions of $C0_2$ from a base case build out or the projected GHG reductions as a result of mitigation measures the proponent will adopt. This oversight needs to be fully addressed in the DEIR.

  A project at this early stage of development provides a multitude of opportunities for designing buildings and transportation management measures that reduce energy consumption and substitute renewable energy sources for fossil fuel sources. Green developments are a smart financial investment. With a growing market demand for facilities that have reduced carbon footprints, rents are being driven higher for the US Building Council's Leadership in Energy and Environmental Design (LEED) certified buildings and ENERGY STAR buildings than rents for less energy-efficient buildings, and occupancy rates are reported to be higher too by the CoStar Group, which released a study on rents, sales, and occupancy for energy efficient buildings in their commercial property database.

  Another study from the New Buildings Institute (NBI) found that building performance averages are 25-30 percent more efficient for LEED certified buildings than non-LEED buildings, and gold-platinum LEED rated buildings are 45 percent better than the national average, which approaches the interim goals of Architecture 2030, (a non-profit organization whose goal is to reduce GHG emissions by changing the way developments

are planned, designed, and constructed). The NBI study also shows a good correlation between modeled and actual building performance, which provides assurances to developers and regulators that these measures will be effective. Additional information on energy efficiency/renewable rating systems is available at a number of websites including: http://energystar.gov/http://www.buildinggreen.com/, www.architecture2030.org/. The website for new construction, core and shell, and commercial interiors for LEED certified buildings is http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222. In addition, for a Massachusetts perspective, consultation with green building experts can be obtained through the Green Building Roundtable: http://www.greenroundtable.org, located in Boston.

All GHG reduction mitigation measures, it will benefit the proponent to use functional and quantitative analyses and mock ups to assess what greenhouse gas reduction measures are feasible for the project type, starting with measures that offer the greatest energy reductions, and then considering what will work operationally. These assessments should either lead to commitments to adopt the LEED and/or ENERGY STAR elements, or the EIR should do a credible job in explaining why a particular efficiency or green power generation component is impracticable. Since there is, for example, no demonstration in the ENF that it would be technically infeasible or cost prohibitive to install combined heat and power (CHP) and/or solar, or geothermal (?) power on-site to generate energy for some of the multiple buildings' functions, the EIR should consider the feasibility of implementing CHP and/or alternative energy sources for the project. CHP units decrease GHG by using the waste heat from the power generation for heating or cooling. The Department plans to adopt a combined heat and power rule this summer, which may reduce the cost of pollution control equipment for the power plant by crediting it with the avoided pollutant emissions that would have been generated from the heat-only generation units. Alternatively, there is no commitment in the ENF to purchase power generated by renewable energy sources for any portion of the electricity use on the site. LEED certification for New Construction/Retail requires a 35%-50% contribution of green power.

Even if on-site power generation is not feasible, many projects now routinely commit to orienting and designing buildings for photovoltaic functions and day-lighting of interiors, insulation, duct sealing, high efficiency windows and other fenestration elements, green roofs or other designs to reduce solar energy absorption (high-albedo) and high efficiency HVAC systems. Interior lighting and thermostat controls to reduce consumption are basic components, and the infrastructure for peak energy shaving can be built into the core-shell designs. Additional information on building design energy reduction measures and standards is available on many websites, including the following: http://www.eere.energy.gov/, http://www.nahb.org, www.sbicouncil.org, http://www.aceee.org, http://www.ashrae.org/, www.coolroofs.org, and http://www.ornl.gov.

There also are substantial energy benefits to be gained by using building materials with recycled content and, at a minimum, the DEIR should discuss how the buildings will be designed so that the tenants will be able to conduct source separation of recyclable materials in compliance with MassDEP Waste Bans. For additional information, visit the

following MassDEP web page: http://www.mass.gov/dep/recycle/wstban01.doc. Similarly, the DEIR should commit to recycling a substantial percentage of the construction and demolition (C&D) waste to comply with the C&D waste ban. Additional information is available on the MassDEP website: http://www.mass.gov/dep/recycle/reduce/cdrguide.pdf.

It is not clear to what extent the proponent will be responsible for developing each of the phases. That should be made more apparent. Even in regard to future construction by tenants, the proponent should explain why it is not practicable to commit to adopt provisions in development agreements that would require future construction to incorporate basic energy efficiency technologies, or CO2 savings equivalent to the buildings. In the event that the proponent is the long term developer, it should the proponent should explain why it is not practicable to commit to adopt provisions in development agreements that would require their buildings to incorporate basic energy efficiency technologies, or CO2 savings equivalent to the buildings. If you have further questions on this topic contact Philip.Weinberg@state.ma.us, 617-292-5972.

The MassDEP CERO appreciates the opportunity to comment on the proposed project. If you have any questions regarding these comments, please do not hesitate to contact Stella Tamul, MEPA Coordinator, at (508) 767-2763.

Sincerely,

Paul Anderson
Deputy Regional Director
Bureau of Resource Protection

Cc: Commissioner's Office, MassDEP
Martin Suuberg, Regional Director, CERO

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CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Hamilton Canal District
PROJECT MUNICIPALITY	: Lowell
PROJECT WATERSHED	: Merrimack
EEA NUMBER	: 14240
PROJECT PROPONENT	: Trinity Hamilton Canal Limited Partnership
DATE NOTICED IN MONITOR	: May 7, 2008

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of an Environmental Impact Report (EIR). In a separate Draft Record of Decision (DROD) issued today, I propose granting a Phase I Waiver to allow a portion of the project to proceed to state permitting prior to completion of the EIR for the entire project. The DROD will be noticed in the June 25, 2008 issue of the *Environmental Monitor* for a 14-day public comment period. Within seven days of the close of comments, I shall reconsider, modify, or confirm the waiver in a Final Record of Decision

Project Description

The project as proposed in the Expanded Environmental Notification Form (EENF) consists of a transit-oriented, mixed use development on a 13-acre site in the Hamilton Canal District. The project includes housing (affordable and market-rate), commercial and retail space, restaurants, a theatre, and art gallery, and includes new construction as well as adaptive reuse of historic buildings. The project is being designed to meet Leadership in Energy and Environmental Design for Neighborhood Development (LEED-ND) criteria and be LEED-certifiable.

The project is located within the boundaries of three historic districts including the Lowell National Historic Park and Preservation District, the Downtown Lowell Historic District and the Locks and Canals Historic District. The site is adjacent to the National Historical Park

Visitor Center and the proposed new Lowell Trial Court. The City of Lowell has partnered with the proponent in developing a Master Plan for the project, which is considered a significant next step in the redevelopment and revitalization of downtown Lowell. The project site includes historic mill buildings associated with former textile manufacturing operations. It is a brownfields site, which is currently undergoing assessment and remediation in accordance with the Massachusetts Contingency Plan (MCP).

The total development proposed, approximately 1.8 million square feet, includes 767,000 gross square feet (gsf) of housing (623 units), 54,800 gsf of retail space, 424,000 gsf of commercial spaces and 627,000 gsf of parking (1,964 surface, above and below-grade spaces including a 980-car garage). The EENF estimates that approximately 10,440 new vehicle trips per day will be generated by the proposed project. The project is being designed as a transit - oriented development with an expanded trolley system proposed from Dutton Street to the Gallagher Transportation Terminal, located a quarter mile south of the site. The transportation component of the project also includes a new four-way intersection and reconfiguration at the Lord Overpass, pedestrian linkages and canal walks, a new Jackson Street extension to Thorndike Street, and an extension of Broadway Street across the Merrimack Canal. The project includes new bridge construction across the Hamilton and Pawtucket Canals, rehabilitation of existing canal crossings, and a temporary bridge across the Hamilton Canal (to accommodate construction vehicles during Phase I).

The project includes restoration of the majority of the Freudenberg building (an existing building addition is proposed for demolition), and retention of historic walls remaining from other structures, primarily the Appleton Manufacturing Company buildings. The EENF indicates that several historic Appleton buildings are proposed for demolition as they are unsafe and in a state of disrepair, and restoration is infeasible.

Permits and Jurisdiction

The project is undergoing review and requires the preparation of a mandatory EIR pursuant to Section 11.03 (6)(a)(6) of the MEPA regulations because it will result in generation of 3,000 or more new average daily trips (adt) and Section 11.03 (6)(a)(7) due to construction of 1,000 or more new parking spaces at a single location.

The project is also undergoing environmental review pursuant to Section 11.03(1)(b) (3) because it involves conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97. The project is also under review pursuant to Section 11.03(1)(b)(7) because it requires approval in accordance with M.G.L. c. 121B of a modification to an existing urban renewal plan; Section 11.03(3)(b)(6) because it involves reconstruction of a pile-supported structure of 2,000 or more square foot (sf) base area that occupies waterways; Section 11.03(10)(b)(1) because it involves demolition of a historic structure located in a Historic District listed in the State Register of Historic Places; and Section 11.03(5)(b)(3)(c) because it involves construction of one-half or more miles of new sewer mains.

The proposed project will be reviewed under the Integrated MEPA/Permitting Review pilot process. Permits and approvals required include a Vehicular Access Permit from the Massachusetts Highway Department (MassHighway); a Chapter 91 License and Sewer Connection/Extension Permit from the Massachusetts Department of Environmental Protection (MassDEP); approval of an Urban Renewal Plan Amendment from the Department of Housing and Community Development (DHCD); easements from the Department of Conservation and Recreation (DCR) and the Division of Capital Assets and Management (DCAM); and possibly a short-term permit for construction of a temporary bridge from DCR. Since granting of easements on DCR-owned property constitutes a disposition of land, the project requires legislative approval pursuant to Article 97 of the Massachusetts Constitution. The project is also subject to review by the Massachusetts Historic Commission. The proposed project involves state funding (transportation funding and potentially State Historic Tax Credits). The project is subject to the EEA/MEPA Greenhouse Gas Policy.

As discussed in the EENF, there are several ownership entities involved in the project, including the City of Lowell, the Lowell National Historic Park (LNHP), DCAM and DCR. Implementation of the project will require conveyance of parcels of land from the City to the proponent and a conveyance or lease from the LNHP for redevelopment of existing parking lots. The proposed street network and pedestrian routes will require approvals for use of DCR-owned property. The City will also be conveying parcels to DCAM for the proposed Trial Court[1]

The project involves state funding. Therefore, MEPA jurisdiction is broad and extends to all aspects of the project with the potential to cause Damage to the Environment as defined in the MEPA regulations.

Phase I

The project is proposed as a phased development. The proponent has requested a Phase I Waiver to allow a portion of the project to proceed prior to completion of the EIR for the entire project. The Phase I portion includes adaptive reuse of the historic Appleton Mill complex for housing (220,000 sf) and the Freudenberg Building for office space (50,000 sf). Phase I also includes construction of a temporary bridge.

As noted in the DCR comment letter, a properly conditioned permit or temporary easement may be required for the proponent to construct a temporary bridge during construction of Phase I because the existing bridges may not be able to support the load of vehicles and equipment required. The proponent may apply to DCR for a short-term revocable permit authorizing the construction of a temporary bridge. The granting of a temporary easement for such use would invoke the requirements of Article 97. If a temporary easement is required, the proponent should coordinate with DCR and DCAM regarding the draft legislation and to develop a mitigation plan.

Based on information provided in the EENF transportation study, Phase I is expected to generate 1,460 vehicle trips on an average weekday and 940 trips on an average Saturday. The

[1] The proposed new Lowell Trial Court is not part of the Hamilton Canal District Project but was considered in the EENF traffic analysis.

proponent has proposed mitigation for Phase I impacts consisting of widening at the Middlesex Street westbound approach to the Lord Overpass, restriping of the Lord Overpass and approaching roadways, and retiming of existing traffic signals to optimize overall traffic flow. The analysis in the EENF has demonstrated that upon implementation of the proposed mitigation measures, the existing infrastructure can generally accommodate the traffic associated with Phase I of the project. The Executive Office Transportation and Public Works (EOTPW) does not object to the granting of a Phase I Waiver.

The proposed temporary bridge for Phase I construction will also require a Chapter 91 License from MassDEP. The proponent should provide additional information to MassDEP identifying the exact location and construction methodologies proposed. The proponent should also coordinate with MHC regarding adverse effects to historic resources and to provide additional information that may be required for MHC review.

Expanded ENF Review

The EENF provides an overview of the project, including a description of the site, its historical use, and the master planning process for the proposed redevelopment. The EENF includes a breakdown and a map indicating the proposed development for each of the 17 parcels on the project site. The EENF includes a detailed description of the proposed project, a timeline for the phased development, and a list of permits and approvals required. The EENF also includes an analysis of alternatives, environmental impacts and proposed mitigation measures.

Consistency with state, local and regional policies

The project as presented in the EENF is the result of a joint master planning process between the proponent and the City of Lowell, which includes five public charettes, also referred to in the EENF as "Vision Sessions". The fourth vision session was held on May 29th, 2008 and included presentation and discussion of the draft form-based zoning code for the project. As noted in the EENF, the intent of the form-based zoning code is to establish clear design expectations for the project early in the development process. The EENF includes a discussion of land use controls for the project and consistency with local and regional plans. The City of Lowell, in its comment letter, supports the project and the Phase I Waiver request. The Northern Middlesex Council of Governments (NMCOG) in its comment letter, expresses support for the project, including the Phase I Waiver request, and notes that the project is consistent with the NMCOG regional growth policy plan, and is identified as a priority project within the Greater Lowell Comprehensive Economic Development Strategy (CEDS). In addition, NMCOG has also worked with the City of Lowell in designating the site as a Priority Development Site for Chapter 43D expedited permitting.

The EENF notes that the proponent intends to use the Commonwealth's Ten Sustainable Development Principles as a guide in developing the master plan for the site. As discussed in the EENF, the Jackson Appleton Middlesex (JAM) Plan, created in 1987 and later amended in 2000, emphasized industrial expansion, which is now considered inappropriate for current conditions. Hence, the EENF proposal for a transit-oriented mixed-use development, consistent with the City's Comprehensive Plan and the Commonwealth's emphasis on smart-growth strategies. The

proposed project master plan and the form-based zoning code will be submitted as part of an amendment to the JAM Plan, which will require approval from the Lowell City Council and the Department of Housing and Community Development (DHCD).

The EENF includes a discussion of compliance with the EEA Article 97 Disposition Policy. The project requires easements over DCR property (considered a change in use of parkland) and is therefore subject to legislative approval of the disposition for proposed construction and reconstruction of bridges and pedestrian crossings. As described in the EENF, the project cannot provide public access without crossing the canals, and therefore there is no feasible alternative that would not involve the use of Article 97 lands. In addition, the project will support redevelopment and revitalization of the Hamilton Canal district and Downtown Lowell, and the proponent proposes to swap an on-site parcel as mitigation for the land included in the proposed disposition.

Sustainable Design

The EENF includes a chapter on urban design that describes site layout and design principles, as well as proposed development and open space for each of the 17 parcels. The EENF indicates that the project will be designed to LEED Neighborhood Development standards and all buildings will be LEED-certifiable. The project includes green walls and roof for the parking garage. The EENF includes a LEED-ND project checklist and a summary of how the project scores for different LEED-ND categories. As described in the EENF, the project meets all the pre-requisites for the Smart Location and Linkage category and qualifies for many credits in the Neighborhood Pattern and Design and the Green Construction and Technology categories. The proponent expects that the project will score in the Silver category for LEED-ND and will evaluate other potential design elements that may warrant a Gold rating.

Wetlands and Waterways

The project, as described in the EENF, includes new and replacement pedestrian and vehicular bridges over the Hamilton and Lower Pawtucket Canals in order to connect the proposed development to the surrounding community. Given the nature of the project site, which is bounded by canals and has no interior roadways connecting to existing public ways, I concur with MassDEP that the proposed crossings qualify for consideration as water-dependent infrastructure crossing facilities.

The canals in the project area are considered to be wetland resource areas. The banks of the canals play a role in control of flood waters and storm damage prevention. The EENF includes a graphic outlining Land Under Water (LUW) and Bank resource and buffer areas. As discussed in the EENF, the bridge work proposed will occur on upland portions of the site and bridge structures will span the canals. Potential impacts include shading, which is considered insignificant in the context of this project. Impacts to navigation will also be considered as part of the Chapter 91 licensing required for the project. According to the EENF, the proposed bridges will have the same or greater clearances as existing bridges and will therefore not adversely impact navigation. The proponent has committed to stormwater and erosion controls to prevent any adverse affects to water quality from proposed work in the buffer zone.

Air Quality

The EENF includes a mesoscale analysis as required for projects that exceed the MassDEP review threshold of 6,000 daily trips for mixed-use projects. The purpose of the analysis is to determine the potential increase in volatile organic compounds (VOCs) and nitrogen oxides (NOx) emissions in the project study area and to identify mitigation measures to reduce project-related trips and associated emissions.

The mesoscale analysis predicted VOC and NOx emissions using the current USEPA emission model (MOBILE 6.2) and traffic flow conditions for the 2007 existing, 2012 Phase I Build, 2017 No Build, and 2017 Build and Build with Mitigation conditions. The modeling results indicate an 8.8 percent increase of VOC and NOx under the 2017 Build compared to the No Build conditions. The proponent has committed to several traffic mitigation and transportation demand management (TDM) measures that would result in a five percent reduction in the project's average daily traffic, and less than a one percent reduction in NOx and VOC emissions.

The EENF also analyzes Greenhouse Gas (GHG) emissions in accordance with the EEA/MEPA GHG Emissions Policy and Protocol. The GHG analysis in the EENF includes an analysis of direct and indirect GHG emissions. CO_2 emissions for the project's energy use are estimated at 28,116 tons per year The EENF includes proposed mitigation measures that are expected to reduce CO_2 emissions by 26 percent overall (this includes an estimated 5 percent reduction in CO_2 from TDM). The EENF includes a meso-scale analysis of transportation-related impacts and compares CO_2 emissions for the 2007 Existing conditions, the 2017 No-Build condition and the 2017 Build and 2017 Build with Mitigation conditions. The analysis estimates that the 2017 Build condition produces 959.2 tons per year (tpy) compared with 910.7 tpy produced by the 2017 Build with Mitigation condition. According to the EENF, the combined traffic mitigation and TDM measures proposed will reduce CO_2 emissions by five percent. MassDEP accepts the modeling assumptions and accuracy of the analysis and results. However, MassDEP also believes that the level of estimated CO_2 reductions does not adequately meet the GHG policy requirements to identify measures to avoid, minimize, and mitigate these emissions. While MassDEP is not recommending a particular threshold of acceptable CO_2 emission reductions, analyses from comparable projects have estimated that mitigation programs could achieve approximately ten percent overall reduction in mobiles source CO_2 emissions.

According to the EENF, the project is being designed to reduce the demand for electricity, thereby reducing indirect CO_2 emissions, and to reduce direct emissions associated with fuel combustion for heating and other uses. A key component of the mitigation plan for VOC, NOx and CO_2 emissions includes efforts to reduce the number of single-vehicle occupant trips to and from the site. The project is located in close proximity to the Lowell Regional Transit authority (LRTA) Gallagher Transit Terminal, the Kennedy Bus Tranfer Center, and the Massachusetts Bay Transit Authority (MBTA) Lowell Commuter Rail Station. The proponent has committed to work with LRTA, MBTA and Merrimack Valley Regional Transit Authority (MVRTA) to develop a comprehensive transportation plan for the project, and will work with the National Park Service and the City of Lowell to expand the existing trolley system. The

proponent should expand upon the GHG analysis and mitigation plan as further detailed in the Scope below.

Geotechnical and Groundwater Analysis

The proposed project includes buildings ranging from three to fifteen stories and may include up to two levels of underground parking. The proponent has conducted a preliminary analysis of subsurface conditions on-site and included a summary in the EENF. A more detailed geotechnical subsurface investigation will be conducted for each parcel to inform recommendations for site-specific foundation design. Underground parking may require excavation of up to 15 feet, which will require temporary earth support systems and discharge of construction dewatering. Groundwater quality will be monitored during construction.

Waste Site Clean-up

The EENF discusses environmental assessments and other investigations under the Massachusetts Contingency Plan (MCP) that have been conducted because of contamination associated with historic uses of the site. Sixteen Release Tracking Numbers (RTN) have been assigned to ten of the parcels on-site. The proponent is working with MassDEP to coordinate investigations and clean-up required under the MCP. Six of the RTN sites have been cleaned up to applicable standards and achieved a Response Action Outcome (RAO). Two of the RTNs are still undergoing investigation and/or remediation and eight RTNs are under a Special Project Designation Permit which defers MCP deadlines to a schedule consistent with the development plan for the site. The EENF indicates that soil and groundwater testing program will be implemented to assess conditions prior to construction, and notification will be provided to MassDEP as required under the MCP. Excess soil will be characterized for off-site disposal, treatment, reuse and recycling in accordance with MassDEP and MCP requirements.

Construction

The proponent has committed to a Construction Management Plan (CMP) which will be submitted to the City of Lowell Public Works Department for review prior to construction. The CMP will include detailed information on construction and demolition, mitigation measures, traffic routing, and access and staging areas. The proponent intends to coordinate extensively with the City on transportation planning for the construction period.

Transportation

The EENF included a transportation study that generally confirms to the EEA/EOTPW Guidelines for EIR/EIS Traffic Impact Assessments. The EENF includes the results of a traffic study conducted to analyze potential impacts in the study area, which includes 34 intersections. The EENF includes a summary of the existing conditions assessment of transportation infrastructure and traffic operations conducted by the proponent. The analysis in the EENF includes potential impacts projected to the year 2017 and considers planned roadway improvements and other planned development projects. The project is expected to generate 746 new trips during weekday morning peak hour, 1,032 trips during the weekday evening peak hour

and 1,063 new trips during the Saturday midday peak hour. The EENF also projects additional pass-by trips during those peak hours (14, 50, and 146 respectively). The total vehicle trip estimate for the project is approximately 10,450 trips per day. Phase I of the project is expected to generate 1,460 vehicle trips on an average weekday.

The EENF concludes that several signalized intersections already are operating at or above capacity, or will do in the future even without the proposed development. According to the EENF, the proposed project will result in one additional intersection operating at or above capacity and/or with delays greater than 55 seconds. The EENF concludes that the project will result in an additional five unsignalized intersections operating at or above capacity.

The EENF includes a mitigation section describing proposed site access and roadway improvements. These improvements include the Revere Street and Jackson Street extensions and proposed intersection improvements at the Lord Overpass and 17 other intersections. The EENF includes an intersection capacity analysis that incorporates the proposed roadway and traffic signal improvements, and concludes that the project's traffic can be accommodated with no significant impact on future traffic operations.

The EENF proposes pedestrian improvements on-site and in the project area, including widening to incorporate sidewalks on existing canal bridges, a trolley expansion, and a sidewalk on Jackson Street (which would connect with the Hamilton Canal Walk, completing a pedestrian connection from the Revere Street Bridge to Central Street). The proponent has also committed to a Transportation Demand Management (TDM) program to reduce single occupancy vehicle (SOV) trips. The TDM program will include an on-site Transportation Coordinator, a carpool/preferred parking program, and bicycle racks, and the proponent will explore opportunities with the Lowell Regional Transit Authority (LRTA) to increase bus access to the project site.

SCOPE

General

The proposed project is the first project to be reviewed under the Integrated MEPA/Permitting Review Process. As part of the integrated review process, an Inter-Agency meeting for the proposed project was held during the EENF review period, which included representatives of state agencies, the City of Lowell and the regional planning agency (North Middlesex Council of Governments). Pursuant to the policy on Integrated MEPA/Permitting Review, state agencies are expected to submit comments identifying information they require in the DEIR and in permit applications.

Several state agencies have submitted detailed comments on the EENF. In addition to a general response to comments, the proponent shall provide in the DEIR a detailed response to the comment letters dated June 6, 2008 submitted by DCR, MassDEP and EOT and the comment letter dated June 5, 2008 from MHC. The proponent may choose to submit draft permit

applications with the DEIR. The Scope for the Final EIR will require inclusion of permit applications for public review and comment.

The proponent should prepare a Draft EIR (DEIR) in accordance with the general guidance for outline and content found in Section 11.07 of the MEPA regulations as modified by this Scope. The DEIR should include maps and plans at a reasonable scale, a project summary and schedule, a list of permits required and a description of any changes since the filing of the EENF.

Alternatives

The DEIR should include an analysis of alternatives to removal and reconstruction of the two bridges associated with the Lord Overpass reconfiguration. As further detailed in the EOTPW letter, the proponent must demonstrate that there are no other feasible alternatives that could mitigate the project's traffic impacts. The DEIR should include an evaluation of alternative Article 97 replacement property, transportation improvement options, and additional Low Impact Development (LID), GHG, and other sustainable design mitigation measures as further detailed in other sections of the Scope below.

Article 97 Disposition

As further detailed in its comment letter, the DCR has care and control of Commonwealth-owned property and associated air rights on the site including narrow strips of land abutting sections of the Hamilton and Pawtucket Canals, and land to the easterly side of the Merrimack Canal. The DCR easements requested by the proponent would constitute a disposition of property under Article 97 of the Massachusetts Constitution requiring approval of the legislature. In addition, a permit or temporary easement may be required for the proposed Phase I temporary bridge required for Phase I construction.

The DEIR should include an update on the status of the proposed temporary bridge permitting process and clarify whether the proponent has applied for a short-term permit or intends to request a temporary easement under Article 97. The proponent should consult with DCR before filing Article 97 legislation, and during preparation of the DEIR. As further detailed in the DCR comment letter, there are a number of issues that must be resolved relating to land ownership, bridge construction, and compensation and mitigation.

The DEIR should include a revised parcel map that identifies any changes since the EENF based on consultation with DCR regarding property ownership. The proponent should work with DCR to reach agreement on the details of proposed compensation as well as mitigation required under EEA's no-net loss policy. The EENF proposes Parcel 3 (Point Park) as mitigation. The DEIR should clarify whether DCR or the City of Lowell Parks Department would accept this replacement land. If replacement property is to be placed under the care and control of DCR, the DEIR should identify other opportunities for compensation and mitigation in the Lowell area as DCR maintains a minimal presence in the project area.

The DEIR should include details of proposed compensation and mitigation based on agreements reached with DCR. The DEIR should clarify whether land transfer will be accomplished through easements or the DCR-preferred approach, which is outright disposition of a fee interest in DCR-owned land. The proponent should also coordinate with DCAM on land transfer, compensation and mitigation issues. The DEIR should include an update on consultations with DCR and DCAM and the status of the Article 97 draft legislation, and a discussion of the project's consistency with the EEA Article 97 Land Disposition Policy.

The DEIR should include additional information on the proposed bridge construction and rehabilitation including a description of how the bridges will be designed to avoid stress on canal walls. The proponent should consult with DCR prior to filing the DEIR and provide DCR with additional details on existing and proposed bridge footings as requested in its comment letter.

Wetlands and Waterways

Pursuant to 310 CMR 9.35(2)(a), Chapter 91 jurisdiction extends to any activities that would impact continued navigation within the canal system. The proponent should work closely with the National Park Service (NPS), which currently provides canal tours on the Pawtucket Canal, to address issues relating to clearance. The DEIR should describe how the project will be consistent with Chapter 91 requirements and maintain adequate clearance in construction and expansion of proposed bridges and reconstruction of existing bridges.

The DEIR should describe and quantify the extent of wetland alteration associated with the project. The DEIR should explain how the project will comply with the performance standards in the wetlands regulations, and demonstrate that alteration of resource areas has been avoided and minimized.

Stormwater Management and Low Impact Development (LID)

The DEIR should describe in detail how the project will comply with MassDEP's revised stormwater management standards, which require an analysis of applicable LID measures as a precursor to implementation of structural stormwater management measures. The MassDEP Stormwater Management Policy was revised and incorporated into the Wetlands and 401 Water Quality Certification regulations on January 2, 2008. As noted in the MassDEP comment letter, LID, when combined with pollution prevention measures, can be less costly than conventional gutter and pipe drainage systems and can provide redundancy for stormwater control. I commend the proponent for its commitment to incorporate green roofs and other sustainable design measures. I also acknowledge that the proposed redevelopment may result in a decrease of impervious area compared to prior conditions. However, the DEIR should include a more detailed evaluation of LID measures and specific best management practices (BMPs) proposed as further detailed below and in the MassDEP comment letter.

The DEIR should evaluate stormwater runoff impacts during construction and post-construction. The DEIR should demonstrate that source controls, pollution prevention measures, erosion and sedimentation controls, and the post-development drainage system will be designed in compliance with the MassDEP Stormwater Management Regulations (SMR) and the City of

Lowell's Stormwater Management Program. The DEIR should include calculations, stormwater design plans at a readable scale, best management practices (BMP) designs, and supporting information in conformance with the SRM and National Pollutant Discharge Elimination System (NPDES) permit. The DEIR should respond to MassDEP's comments regarding stormwater including comments on illicit discharge elimination and stormwater infiltration. As noted by MassDEP, the project would be considered a land use with higher potential pollutant load and subject to SMR Standard 5, and it would not be appropriate to infiltrate in areas where there is potential to mobilize and transport contaminants in soils and groundwater.

Historical Resources

The project involves either a ground lease or sale of property by the National Park Service and is therefore subject to Section 106 of the National Historic Preservation Act. The Massachusetts Historical Commission (MHC) has determined that the proposed project will have an "adverse effect" (950 CMR 71.05(a)) on historic properties through the partial demolition of the Freudenberg Building (Sacco-Lowell Shops #14) and through removal of extensive structural fabric at the Appleton Mills Complex. Phase I of the proposed project includes demolition and rehabilitation of these historic resources. As noted in the MHC comment letter, the Appleton Mill buildings are currently in an advanced state of disrepair and MHC has no objection to the Phase I Waiver request. However, MHC also notes in its comment letter that the current proposal for adaptive reuse of the Appleton Mills Complex would not qualify for Federal Investment Tax Credits because the work involved would not meet the Secretary of the Interior's Standards for the Rehabilitation of Historic Properties

The proponent should consult with MHC regarding mitigation of adverse effects to historic resources (36 CFR 800.6 and 950 CMR 71.07(3)). The DEIR should include additional information on the proposed new construction in order for MHC to assess impacts of the new construction on the character and setting of the historic districts in which the project is located. The proponent should consult with MHC to identify specific details required. MHC has expressed concern regarding the proposed high-rise buildings on parcels 2, 3 and 4. The DEIR should include the results of visual and shadow studies and an assessment of effects on historic resources. The DEIR should also include an assessment of the impacts associated with proposed bridge construction and reconstruction on historic resources. The DEIR should include an update on plans for the waterwheel and raceway (located under the Appleton Mills building), which the proponent indicates will not be impacted during Phase I.

The DEIR should include an update on consultations with MHC and development of a Memorandum of Understanding (MOU), as well as any design changes since the filing of the EENF and a description of measures to avoid, minimize or mitigate impacts to historic resources.

Environmental Justice

Although the project is not subject to the EEA Environmental Justice Policy, as a participant in the Integrated MEPA/Permitting Review, the proponent has agreed to conduct expanded outreach to Environmental Justice (EJ) communities in the project area. As further detailed in a letter dated June 6, 2008, the proponent has committed to implement an EJ plan and

will work with the City of Lowell to translate project information into Spanish, Portugese, and Khmer and work with community groups to disseminate information, and to ensure proper representation and that the project will not have a disproportionate impact on EJ communities. The DEIR should include an update on implementation of the EJ plan.

Transportation

The project will require permits from MassHighway for implementation of proposed roadway improvements including the extension of Jackson Street to create a new four-way intersection and the reconfiguration of the Lord Overpass to improve traffic flow. As noted in the EOTPW comment letter, the roadways and Lord Overpass are under state highway jurisdiction while the bridges (with the exception of the Chelmsford Street Bridge over the B&M railroad) and the traffic signals are owned and maintained by the City of Lowell.

The EENF proposes reconstruction of the Dutton Street/Fletcher Street/Thorndike Street intersection to create a four-way signalized intersection with the Jackson Street extension. The conceptual layout of the new intersection proposed in the EENF indicates that the proposed design may require significant structural modifications to the bridge and potential environmental impacts to the Hamilton Canal. The DEIR should address this issue and include plans of sufficient detail as further detailed in the EOTPW comment letter.

The proposed improvements to the Lord Overpass would require removal of the Middlesex Street Bridge and reconstruction of Chelmsford Street/Appleton Street Bridge to accommodate the diverted traffic. EOTPW has expressed concerns in its comment letter regarding removal and reconstruction of two bridges that have not been deemed to be structurally deficient, particularly if state funds are proposed to be used. The proponent should work closely with EOTPW/MassHighway during preparation of the DEIR to clearly demonstrate that there are no other feasible alternatives, other than reconfiguration of the Lord Overpass, that could mitigate the traffic impacts of the project. The DEIR should include additional information to support the proponent's preferred alternative and explain why other alternatives are considered infeasible.

The DEIR should include updated information regarding the project's proposed traffic mitigation. As noted in the NMCOG comment letter, traffic mitigation is being slightly modified to address comments recently received from downtown residents and businesses. The DEIR should address comments received from residents regarding components of the traffic mitigation plan that may adversely affect businesses in the Middlesex Street area by eliminating an existing bridge providing access to the district. I encourage the proponent to also consider the comments and recommendations in the letter from WalkBoston in order to enhance pedestrian and bicycle networks and access to public transit.

The DEIR should include an update on the local permitting process with respect to state highway issues. The DEIR should include an update on the proposed TDM plan, including discussions with MBTA, LRTA and MVTA and incentives and amenities for commuters. The DEIR should include a letter of commitment that identifies all proposed mitigation measures as well as parties responsible for implementing improvements. I encourage the proponent to meet

with the Public/Private Development Unit and the MassHighway District 4 Office during preparation of the DEIR.

Air Quality

Greenhouse Gas (GHG) Emissions

A project at this early stage of development provides a multitude of opportunities for designing buildings and transportation management measures that reduce energy consumption and substitute fossil fuel with renewable energy sources. As further detailed in the MassDEP comment letter, recent studies have demonstrated the growing market demand for green buildings and the performance efficiencies associated with LEED-rated buildings. I refer the proponent to MassDEP's comment letter for additional information and references to relevant studies.

The DEIR should include additional information and analysis, as outlined below and in the MassDEP comment letter, to show that the preferred alternative would achieve significant reductions in GHG emissions with building design, selection of building materials, and water and sewer infrastructure upgrades and efficiencies that reduce and/or offset the fossil fuel energy demand for the project. The revised GHG analysis should incorporate the mitigation measures identified in the MassDEP comment letter, in order to quantify additional emission reductions that are potentially achievable. If the proponent is not able to adopt any of these measures, the DEIR should provide technical and cost analyses to document the rationale for not making a commitment to a recommended mitigation.

The proponent should undertake additional analyses as recommended by MassDEP to assess feasible GHG reduction measures. The DEIR should include an assessment of feasible GHG reduction measures for the project, starting with measures that offer the greatest energy reductions and then consider opportunities to improve ongoing operations. The DEIR should evaluate the feasibility of LEED and/or Energy Star elements. If a particular efficiency or green power generation component is not proposed, the DEIR should explain why it is considered impracticable. The DEIR should include an assessment of the feasibility of implementing solar and other alternative energy sources for the project, and explore opportunities to purchase power generated by renewable energy sources. The proponent has committed to some energy efficient elements such as lighting, insulation and high-albedo roof materials, which is commendable. The DEIR should also consider other energy efficient measures as recommended by MassDEP.

Consistent with the GHG policy, the DEIR should model at least one mitigation alternative that would result in greater GHG reductions than the preferred alternative, which will help identify opportunities for energy savings achievable by varying building design and layout strategies. The DEIR should explain why certain energy efficient techniques are not selected, to assist in the determination that the preferred alternative has avoided, minimized and mitigated CO2 emissions.

Based on the Department of Energy Resources (DOER) review of the EENF, the proponent's energy model must be optimized for the Massachusetts Building Code, which is the

baseline alternative for energy usage in calculating GHG emissions, pursuant to the MEPA GHG Policy and Protocol. The proponent should consider contacting the construction division of its natural gas and electricity utility in Lowell (National Grid) to take advantage of potential rebates available for installation of highly energy efficient equipment.

The EENF notes that certain energy-efficient measures, such as daylighting, on-site renewables, use of motion sensors, tracking energy performance, and third party building commissioning are infeasible or inappropriate. These potential mitigation measures should be reconsidered in the DEIR. The DEIR should include additional information on the Heating, Ventilating and Air Conditioning (HVAC) system, exterior lighting, insulation, daylighting, on-site renewable energy sources, third party building commissioning, and building energy management systems to address DOER comments (which are incorporated in the MassDEP comment letter). If the proponent is not adopting the measures recommended by DOER, the DEIR should provide technical and cost analyses to document the rationale for not making a commitment to a mitigation measure.

The DEIR should describe the proponent's strategy for monitoring energy performance of buildings to ensure the energy systems function as designed over the long-term. As noted by DOER, a system for monitoring energy performance would be expected to pay for itself by eliminating potential inefficient energy operations. A system to monitor energy performance will be necessary to demonstrate that the performance improvements expected have been achieved.

The DEIR should address the contradictions noted by DOER in relation to on-site renewable energy. Table 6 of the EENF indicates that on-site renewables are inappropriate for the project. However, the EENF also indicates that the project would achieve LEED-ND with Credits 1 and 13 for solar orientation and on-site renewable energy sources, respectively. The DEIR should clarify commitments to solar energy and other renewable sources. The proponent should evaluate the feasibility of constructing roofs for new buildings to support the added weight of a solar photovoltaic (PV) system for potential installation during project construction or at a future date. DOER has recommended that a life-cycle analysis be included in the EIR, considering the support of subsidies through the Commonwealth Solar and Renewable Portfolio Standard (RPS) Program, to evaluate the installation of a PV system during project construction under two scenarios: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party that will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. If PV is considered economically infeasible at this time, DOER recommends that the proponent consider PV installation for a future date and state its willingness to host a third-party-owned PV array under a favorable power purchase agreement.

Given the project location near the canals, the DEIR should consider the potential for water-source heat pumps to provide energy for heating and cooling. The DEIR should also evaluate GHG mitigation measures to address energy use associated with water use and wastewater treatment. Based on the research data referenced in the MassDEP comment letter, the project will require approximately 35,522 kilowatt hour (kWh) over the course of a year for wastewater treatment and 21,410 kWh to supply water to the project.

As requested by MassDEP, the DEIR should include a quantification of GHG impacts associated with materials management so that mitigation efforts can be more clearly identified and targeted appropriately. I refer the proponent to MassDEP's comment letter for resources to assist with this component of the assessment. The DEIR should include a list of the environmentally preferred products (EPP) to be used, the GHG impacts associated with use of these materials, and an explanation of why an expanded commitment to use additional EPP materials (including on-site use of demolition materials, regionally produced materials, recycled content materials) is not applicable or cannot be confirmed (as noted in the EENF).

The DEIR should include revised Tables 3-8 (from Appendix E - GHG Emissions) to reflect updates to the proponent's assessment and selection of mitigation measures.

Indirect emissions associated with transportation

The mesoscale analysis in the EENF included estimates of expected increases in VOC and NOX from project-related traffic impacts. The mitigation proposed in the EENF to address VOC and NOx emission increases will result in approximately one percent emission reduction. The proponent should continue to seek opportunities to further reduce project-related trips and associated emissions.

The mesoscale analysis estimates the indirect emissions from transportation-generated CO2 emissions associated with vehicle trips and proposes mitigation. Although the EENF proposes a reasonable list of traffic mitigation and TDM measures, the project would still generate a significant number of vehicle trips per day (over 10,000) despite the mitigation program and a ten percent trip reduction credit for TOD. In addition, the proponent's commitment to several potential TDM measures is vague or rejected as "inappropriate to the project type". Table 7 of the EENF (Appendix E-GHG Emissions) contains seven mitigation measures deemed inappropriate, including purchase of alternative fuel and/or fuel efficient vehicles, support of expansion of parking at park-and-ride or transit stations, shared parking, transit pass subsidies, and on-site amenities such as banks, dry-cleaning, food service and childcare, use of pre-tax dollars for HOV commuting costs, on and off-site improvements to reduce vehicle miles traveled (VMT). The DEIR should reconsider these mitigation measures and demonstrate commitments that all feasible measures will be implemented to further reduce VOC, NOx, and CO2 emissions.

The proponent has committed to compliance with the idling provisions of the Massachusetts Air Pollution Control Regulations (310 CMR 7.11) and the Rideshare Regulation (310 CMR 7.16) and has committed to install devices to reduce construction-related engine emissions. The proponent should consider commitment to the additional measures recommended by MassDEP to further reduce vehicle trips and construction-vehicle emissions within the project area.

Sustainable Design

The DEIR should include an update on sustainable design elements of the project based on re-evaluation of GHG mitigation measures as required by this Scope. The DEIR should

include an evaluation of the proposed project in the context of each of the Commonwealth's Ten Principles of Sustainable Development, which the proponent intends to use as guiding principles for the project master plan.

The DEIR should include additional detail on the proponent's comprehensive waste management plan to address waste reduction, environmentally preferable materials use and the need to design for storage and collection of recyclables. The proponent should consider implementing a waste prevention purchasing policy as recommended by MassDEP. The DEIR should include additional information on proposed storage and collection of recyclables as requested by MassDEP in its comment letter. The DEIR should also address MassDEP comments and recommendations regarding compliance with MassDEP waste bans and target-recycling goals.

Wastewater

The proponent should submit its Sewer Connection/Extension Permit application to MassDEP during the MEPA review process in order to expedite review and permitting. Given that the project is participating in the Integrated MEPA/Permitting pilot program, the EIR should include a copy of the permit application, either at the DEIR or FEIR stage. The proponent should confer with the Lowell Regional Wastewater Utility and the City's engineering staff during the design work for the sewer system. I refer the proponent to the MassDEP comment letter for additional guidance on the permit application.

Waste Site Clean-up

As further detailed in the MassDEP comment letter, there are several properties in the project site requiring further response actions under the Massachusetts Contingency Plan (MCP). Two of the RTNs are classified as Tier II sites and do not require a permit. MassDEP has granted two Special Project Designations for the remainder of the RTNs to allow the proponent to better coordinate response actions with proposed development schedule.

The proponent should assess the potential for indoor air quality impacts to existing or proposed buildings from chlorinated volatile organic compounds (VOCs), which have been reported as a contaminant at locations on-site. The assessment should include all relevant site data, such as contamination concentrations in soil and groundwater, depth to groundwater, and soil gas concentrations. A summary of the impact assessment should be provided in the DEIR.

The DEIR should include a draft plan for management of groundwater during proposed dewatering activities that describes how exacerbation of site conditions will be avoided. In addition, because there is potential for release of contaminants to surface water bodies, the DEIR should also describe plans for investigation of surface and sediment quality in the canals to determine if remedial actions are necessary, as recommended by MassDEP. The DEIR should describe plans for dust monitoring and suppression as recommended by MassDEP to address potential impacts associated with contaminants.

I refer the proponent to MassDEP's comment letter for additional guidance and information relating to construction and site investigation timelines. The DEIR should include an update on MCP-related site investigations and response actions.

The project will likely require abatement and removal of asbestos from existing buildings. The proponent should ensure that MassDEP requirements for asbestos remediation are met as further detailed in its comment letter (items 1-9). The DEIR should include an update on asbestos investigations and remediation plans.

Construction and Demolition

The proposed demolition and reconstruction will generate a significant amount of construction and demolition (C&D) debris. The EENF commits to recycling 50 percent of construction debris. As further detailed in the MassDEP comment letter, demolition activities must comply with both Solid Waste and Air Pollution Control regulations, including those related to asphalt, brick and concrete (ABC) rubble, and asbestos-containing materials. The DEIR should discuss the project's consistency with applicable regulations and identify any additional MassDEP permits or approvals required.

MassDEP has requested that the proponent commit to developing a construction waste management plan (CWMP) that fully complies with the Massachusetts waste bans and establishes a minimum reuse/recycling goal of 50 per cent. I refer the proponent to MassDEP comment letter for additional guidance. The DEIR should include an update on the proponent's CWMP commitments.

Mitigation and Section 61 Findings

The DEIR should include a separate chapter on mitigation measures, which should include a summary table of all mitigation commitments as well as detailed proposed Section 61 Findings for all state permits. The Section 61 Findings should describe proposed mitigation measures, contain clear commitments to mitigation and a schedule for implementation, and identify parties responsible for funding and implementing the mitigation measures. The proposed Section 61 Findings will serve as the primary template for permit conditions.

Response to Comments

In order to ensure that the issues raised by commenters are addressed, the DEIR should include a response to comments to the extent they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of the DEIR beyond what has been expressly identified in this certificate. The DEIR should also include a copy of this Certificate and a copy of each comment letter received on the EENF.

Circulation

The DEIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should be sent to the list of "comments received" below. A copy of the DEIR should be made available for public review at the Lowell Public Libraries.

June 13, 2008

Ian A. Bowles, Secretary

Comments Received

5/23/08	Stephen Kaiser
6/01/08	Joseph P. Smith
6/05/08	Massachusetts Historical Commission
6/05/08	WalkBoston
6/05/08	Lowell Downtown Neighborhood Association
6/06/08	Department of Environmental Protection, Northeast Regional Office
6/06/08	Department of Conservation and Recreation
6/06/08	James T. Lichoulas, Jr.
6/06/08	Durkin Realty Trust
6/06/08	City of Lowell, Office of the City Manager
6/06/08	Northern Middlesex Council of Governments
6/06/08	Fort Point Associates (on behalf of the proponent)
6/09/08	Executive Office of Transportation, Public/Private Development Unit
6/09/08	Mark E. Goldman

IAB/AE/ae

AE

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
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DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

June 6, 2008

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Lowell
Hamilton Canal District
Jackson, Revere, Middlesex,
and Dutton Streets
EEA # 14240

Attn: MEPA Unit

Dear Secretary Bowles:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the Expanded Environmental Notification Form (EENF) submitted by Trinity Hamilton Canal Limited Partnership to redevelop a 13-acre parcel in downtown Lowell by constructing 13 buildings and one parking garage that will include 766,879 square feet (sf) for about 623 residential housing units, 382,500 sf of office space, 54,800 sf of retail space, 6,500 sf of restaurant/commercial space, 34,566 sf of gallery space and 450-seat theatre, and 627,050 sf of parking (EEA# 14240). The project is categorically included for the preparation of an environmental impact report EIR, and the proponent is requesting a Phase I waiver for 161 housing units, a gallery, office, and below grade parking totaling 275,975 sf (Table 10.1[1]). The project also is proposed under the draft provisions in MEPA for an integrated permitting review.

Section 61 Finding

The Department requests that the EIR include a Section 61 Finding describing and listing mitigation measures to avoid, minimize, and mitigate environmental impacts from the project that relate to the MassDEP permits. The Section 61 Finding also should identify the parties responsible for implementing these measures, and an approximate schedule for completing the work after the environment is impacted.

Chapter 91, Waterways License

Three canals (Merrimack Canal, Pawtucket Canal, and the Hamilton Canal) in downtown Lowell establish boundaries for the proposed project site. The construction of the

[1] The total square footage of Phase I, presented in Table 10.1 is in error. Instead of 27,975 sf, the total should read 275,975 sf.

locks and canals were authorized by legislative grant, Chapter 13 of the Acts of 1792. Any proposed work within the area of any of the three canals will require Chapter 91 authorization.

The proposed construction, which is within Chapter 91 jurisdiction at the site, includes a new pedestrian and vehicular bridge over the Lower Pawtucket Canal, and a temporary vehicular bridge, as part of Phase I, located next to the existing Revere Street Bridge over the Hamilton Canal. According to the proponent, the need for the temporary bridge was identified only recently, thus there is no discussion of the exact location or construction methodologies associated with it contained within the EENF. Regardless of its location, because it is a new crossing, it would require Chapter 91 authorization. Also proposed is the rehabilitation, expansion, or replacement of three crossings of the Hamilton Canal and one crossing of the Pawtucket Canal. The Hamilton Canal crossings consist of two existing pedestrian bridges that will be refurbished and a vehicular bridge that will have the existing footprint expanded for new sidewalks and a right of way for a proposed trolley route. The Swamp Locks Bridge, over the Pawtucket Canal, also will have its footprint expanded for new sidewalks and a trolley route. In addition to the temporary bridge, the EENF states that the Hamilton Canal crossings are part of Phase I.

Pursuant to 310 CMR 9.12(2)(d), infrastructure crossing facilities, such as the existing and proposed bridges, would be determined to be nonwater-dependent use projects. This designation would change should the Secretary determine that the facilities cannot reasonably be located away from these inland waters based on a comprehensive alternatives analysis and information that analyzes measures to avoid or minimize adverse impacts on the environment. Due to the isolated nature of the proposed site - bounded by canals with no interior roadways connecting to existing public ways - MassDEP believes that the proposed crossings would qualify for consideration as water-dependent infrastructure crossing facilities.

Pursuant to 310 CMR 9.35(2)(a), Chapter 91 jurisdiction would extend to any activities that would impact continued navigation within the canal system. The National Park Service (NPS) presently provides canal tours via boats departing from the Swamp Locks on the Pawtucket Canal. MassDEP recommends that the proponent maintain adequate clearance in the construction and expansions of the proposed bridges and reconstruction of the existing bridges. Clearance less than existing conditions would not be acceptable at the project site. MassDEP also recommends that the proponent work closely with the NPS to address these issues.

Wetlands

The extent of wetland alteration for the project should be described and quantified in the EIR. The report also should explain how the project would comply with the performance standards in the regulations, and demonstrate that alteration of resource areas have been avoided and minimized.

Stormwater

Stormwater runoff impacts during construction and post-construction should be evaluated in the EIR, and it should be demonstrated that source controls, pollution prevention measures, erosion and sediment controls, and the post-development drainage system will be designed in compliance with the MassDEP Stormwater Management regulations (SMR), in effect since the

beginning of 2008. The EIR also should explain how water quality and quantity impacts would be controlled in compliance with the SMR standards for water quality and quantity impacts and the City of Lowell's (City) Stormwater Program. Municipalities, including Lowell are required to prepare and implement Stormwater Management Programs for compliance with the National Pollution Discharge Elimination System (NPDES) Phase II Stormwater General Permit. The EIR should demonstrate that source controls, pollution prevention measures, erosion and sediment controls during construction, and the post-development drainage system will be designed to comply with the SMR, the standards for water quality and quantity impacts, and are consistent with the City's Stormwater Program. Calculations, stormwater system design plans at a readable scale, best management practice (BMP) designs, and supporting information should demonstrate that the stormwater system design provides adequate protection for wetland resources in conformance with the stormwater regulations and NPDES permit. The MassDEP Stormwater Management Policy (SMP) was revised and incorporated into the wetlands and 401 Water Quality Certification regulations on January 2, 2008. Additional information on the stormwater regulations is available on the following MassDEP website: http://www.mass.gov/dep/water/laws/policies.htm - storm.

The EENF provided general information about the stormwater management system, including a brief description of the stormwater performance standards that have been modified and incorporated into the Stormwater Management regulations. However, supporting information and plans were unavailable to confirm that the stormwater management system would be consistent with the SMR. Notably, it appears that the project would be considered a land use with higher potential pollutant load (LUPPL), and subject to SMR Standard 5, because the volume of traffic using the parking on site is estimated to exceed 1,000 trips per day. Moreover, it would not be appropriate to infiltrate stormwater in areas of the site where there would be a potential to mobilize and transport contaminants in soils and groundwater. The redevelopment Standard 7 requires a more rigorous demonstration of compliance with the SMR performance standards, and the new SMR Standard 10 to eliminate illicit discharges was not considered in the EENF.

Low Impact Development

The stormwater regulations require that consideration be given to low impact development (LID) and the use of integrated management practices (IMP) for control of stormwater, either alone or in combination with conventional drainage control measures. LID is an approach to stormwater management that minimizes runoff impacts by maintaining and mimicking existing hydrologic functions through site design techniques such as disconnecting runoff flow pathways and dispersing stormwater control across the site, reducing imperviousness, and minimizing clearing and grading while preserving natural resources and drainage patterns. When combined with pollution prevention measures, LID can be less costly than conventional gutter and pipe drainage system and can provide redundancy for stormwater control.

Wastewater

The projected wastewater flow from the redevelopment project is estimated to be 97,320 gallons per day. Since the length of new gravity sewers and force mains exceed 1,000 feet, and since the EENF indicates the system will be owned and operated by the City, the proponent will

need to secure a MassDEP sewer connection/extension permit prior to construction of the proposed sewer system. Instructions and support materials for this permit can be found at the MassDEP website at http://www.mass.gov/dep/water/approvals/wp7174in.doc. Since this project has been targeted for an expedited environmental review and permitting process, MassDEP advises the proponent to file a sewer connection/extension permit application during the MEPA review process. The permit application review process can proceed concurrently with the MEPA process; however, MassDEP cannot issue a permit until the MEPA review is satisfied fully.

The proponent should confer with the Lowell Regional Wastewater Utility and the City's engineering staff during the design work for the sewer system. The wastewater system designed by the proponent should not allow stormwater or other inflow sources to be conveyed to the sewer system. Designs for the proposed pump stations should include backup power facilities and alarm systems. This information should be included in the sewer connection permit application.

Massachusetts Contingency Plan (MCP)/M.G.L. Chapter 21E

MassDEP has received notification of a release of oil and/or hazardous materials at nine properties within the Hamilton Canal District project site. Fourteen Release Tracking Numbers (RTNs) were assigned to these release conditions, six of which have been closed with the filing of Response Action Outcome (RAO) statements, indicating No Significant Risk exists or that remediation has been achieved without the need for an Activity and Use Limitation (AUL). Two additional RTNs (3-27400 and 3-27420) were assigned to tracking response actions conducted under the Special Project Designation (SPD) permits for the project. Further response actions are currently required at the following sites:

1) 221 Jackson Street – RTN 3-25687 (petroleum);
2) 291 Jackson Street – RTN 3-26423 (trichloroethylene [TCE]);
3) 307 Jackson Street – RTNs 3-26095, 3-26424 (petroleum, PAHs, metals, chlorinated VOCs [PCE, TCE, VC], & PCBs);
4) 351 Jackson Street – RTN 26421 (arsenic, petroleum, PAHs);
5) 6 King Street – RTN 3-26844 (petroleum);
6) 379 Middlesex Street – RTN 3-26426 (gasoline, PAHs); and
7) 389 Middlesex Street – RTN 3-26425 (petroleum, metals).

MCP Permits

MassDEP has granted two Special Project Designation (SPD) Permits for RTNs 3-26423, 3-26424, 3-26421, 3-26425, 3-26426, and 3-26844. The SPD extends the deadline for Tier Classification to January 2010 for these RTNs, thereby establishing a schedule consistent with the project development. This allows the proponent to better coordinate response actions, providing greater cost efficiency.

Two RTNs, (3-25687 and 3-26095), are currently classified as Tier II sites, which do not require a permit. If a site is classified as Tier I site, a Tier I Permit is required in accordance with 310 CMR 40.0700. If MassDEP does not provide the applicant a decision to deny the permit, a decision to grant the permit with conditions, or a Notice of Extended Review within 36 days, the Tier I Permit is presumptively approved.

Potential Indoor Air Impacts

Chlorinated volatile organic compounds such as PCE and TCE, and petroleum products such as gasoline and fuel oil, are volatile organic compounds (VOCs) that can vaporize from contaminated soil and groundwater and impact the indoor air quality of buildings. A release of one or more of these contaminants has been reported at seven of the identified disposal sites. All relevant site data, such as contaminant concentrations in soil and groundwater, depth to groundwater, and soil gas concentrations should be evaluated to determine the potential for indoor air impacts to existing or proposed building structures, and a summary of those assessments should be provided in the EIR.

Dewatering Activities

If dewatering activities are to occur at a site with contaminated groundwater, or in proximity to contaminated groundwater where dewatering can draw in the contamination, a plan must be in place to properly manage the groundwater and ensure site conditions are not exacerbated by these activities. Dewatering should be considered in the EIR.

Soil/Groundwater/Surface Water Impacts

Releases of contamination that have impacted soil and/or groundwater beneath the properties in the Hamilton Canal District project may have migrated into sediment/surface water. Releases at the ground surface may migrate directly into surface water bodies via overland flow or through surface water drainage discharge structures, or contamination may migrate into surface water/sediment via groundwater flow. The site is surrounded by the Merrimack Canal and the Hamilton Canal and is bisected by the Pawtucket Canal. As part of site investigation activities the surface water and sediment quality in these canals should be investigated to determine if remedial actions are necessary.

Dust Monitoring and Suppression

The need to conduct real-time air monitoring for contaminated dust and to implement dust suppression applications must be determined prior to excavation of soils contaminated with compounds such as metals and PCBs. An evaluation of contaminant concentrations in soil should be completed to determine the concentration of contaminated dust that could pose a risk to health of on-site workers and nearby human receptors. If this dust concentration, or action level, is reached during excavation, dust suppression should be implemented as needed.

New Structures and Utilities

Construction activities conducted at a disposal site shall not prevent or impede the implementation of assessment or remedial response actions at the site. Construction of structures at a disposal site may be conducted as a Release Abatement Measure (RAM) if assessment and remedial activities prescribed at 310 CMR 40.0442(3) are completed within and adjacent to the footprint of the proposed structure prior to or concurrent with the construction activities.

Excavation of contaminated soils to construct clean utility corridors should be conducted for all new utility installations.

"Phase I Area" RTN Sites – Status and Future Requirements
291 Jackson Street (RTN 3-26423) and 307 Jackson Street (RTNs 3-26095 and 3-26424)

The three RTNs listed above are for properties in the Phase I development plans. MassDEP understands that since these sites are part of the proponent's Phase I Area of redevelopment, activities may need to be expedited. RTN 3-26095 was Tier Classified as a Tier II Site on July 31, 2007. SPD Permits have been granted for two RTNs, (3-26423 and 3-26424), and the deadline for Tier Classification for these Sites has been extended to January 2010. It should be noted that a Phase II Comprehensive Site Investigation (Phase II) and a Phase III Remedial Action Plan (Phase III) are required within two years of Tier Classification, a Phase IV Remedy Implementation (Phase IV) is required within three years of Tier Classification, and a RAO or Remedy Operation Status (ROS) is required within five years of Tier Classification. However, investigation and/or remediation activities can always be completed prior to, or following Tier Classification, before these deadlines through Release Abatement Measures (310 CMR 40.0440), or if necessary, Immediate Response Actions (310 CMR 40.0410).

Non Phase I RTNs – Status and Future Requirements

The remainder of the RTNs that are included on properties in the Hamilton Canal District project are expected to be completed longer term. MassDEP has deadlines for which investigation and remediation activities must be completed for these Sites. The RTNs for Sites listed at 351 Jackson Street (3-26421), 6 King Street (3-26844), 379 Middlesex Street (3-26426), and 389 Middlesex Street (3-26425) have SPD Permits with the deadline extended for Tier Classification until January 2010. The final RTN is located at 221 Jackson Street (3-25687), and this Site was classified Tier II on February 26, 2007. Comprehensive Response Actions (Ph. II – V) and submittal of an RAO or ROS must be completed pursuant to deadlines at 310 CMR 40.0550 or 40.0560. Remedial response actions may also be conducted under a Release Abatement Measure or Immediate Response Action.

Asbestos Remediation

The EENF does not indicate the presence of asbestos in the properties affected by the project. However, the demolition of the Appleton Mill (currently owned by Division of Capital Asset Management) on King Street and adjacent to the proposed Lowell Trial Court, and the "guard house" near the Freudenberg Building will likely require the abatement and removal of asbestos. MassDEP conducted a site visit on June 3, 2008, and based on that visit, offers the following observations that must be implemented to successfully complete Phase I of the Hamilton Canal Project.

1) Demolition notifications must be filed at least ten working days prior to any demolition activity commencing at the site. A BWPAQ06 Notification Prior to Demolition or Construction form must be filed for each building. This form can be filed electronically (E-filed).

2) An Asbestos Removal Notification Form ANF001 will need to be filed for each building where asbestos abatement or removal is needed at least ten working days prior to the commencement of the activity. This form can be E-filed.

3) An asbestos National Emissions Standards for Hazardous Air Pollutants (NESHAPS) survey should be performed by an Asbestos Inspector certified by the Massachusetts Division of Occupational Safety (DOS) for each structure involved.

4) Any non-standard demolition or asbestos abatement activities would need MassDEP review and approval of the proposal. Activities may include, but are not be limited to, demolition of a building without removing asbestos containing materials due to fire/structural stability problems, bulk loading of asbestos containing waste material, and dry removal.

5) The debris on the ground in the Appleton Mills area of the project could contain asbestos contamination. The RAO for RTN 3-20636 should be reviewed.

6) While MassDEP believes that some asbestos abatement was performed on portions of the Appleton Mills buildings, the buildings and the open area between them may still contain certain types of asbestos at or below grade. Asbestos containing materials could include, but are not be limited to, thermal system insulation, flooring, floor underlayment, window caulking, window glazing, electrical panel boxes, and fire doors.

7) The tunnel in the Fredeunberg building basement appeared to contain asbestos thermal system insulation. This tunnel may need to be removed if it is in a proposed building footprint or if it is in an area which heavy construction machinery will be utilized. Regulations require that this material cannot be made inaccessible for future removal.

8) Salvage drums were observed in a portion of the Appleton Mills buildings. While some of the drums appeared to be empty, it is an indicator that other hazardous materials may be stored in areas not accessed during the June 3, 2008 MassDEP visit.

9) Several tanks and batteries were observed in the Freudenberg building. These may need to be removed and properly disposed of prior to demolition.

Finally, elements 1-4 must be considered and followed (if appropriate) for each structure for the remaining phases of the project.

Greenhouse Gas Emissions

This project is categorically included for the preparation of an environmental impact report and requires a Massachusetts Highway Department (MHD) access permit; therefore, the project is subject to the MEPA Greenhouse Gas Emissions Policy and Protocol. The EENF included a GHG analysis, which was reviewed by MassDEP and the Division of Energy Resources (DOER) in the Executive Office of Energy and Environmental Affairs. The EENF predicts that the project would achieve a rating of silver for Leadership in Energy and Environmental Design for New Construction and Major Renovations (LEED ND), which is currently a pilot program based on established LEED rating criteria. However, in the Urban Design Section 4, it is anticipated that only 20 to 30 percent of the square footage would be LEED certifiable, and that the project would strive to achieve, at a minimum, an energy efficiency improvement of 10 percent. This section of the EENF also mentions the possibility of

incorporating solar and wind power generating facility to reduce the electric demand by about 5 percent. The use of green roofs and water reductions of about 20 percent also are proposed. With these measures, the project design is estimated to generate 20,734 tons per year of CO_2 emissions from stationary sources and 910.7 tons per year of CO_2 emissions from transportation-related sources. The energy efficiency components of the LEED certification are estimated to reduce CO_2 emissions from the base case for direct and indirect stationary sources by about 26.3 percent and 26.2 percent, respectively. Transportation-related sources are predicted to reduce CO_2 emissions by about 5.0 percent. The total CO_2 reduction from the base case is estimated at 25.6 percent.

A project at this early stage of development provides a multitude of opportunities for designing buildings and transportation management measures that reduce energy consumption and substitute renewable energy sources for fossil fuel sources. MassDEP/EEA-DOER believes green developments are a smart financial investment. With a growing market demand for facilities that have reduced carbon footprints, rents are being driven higher for the US Building Council's Leadership in Energy and Environmental Design (LEED) certified buildings and Energy Star buildings than rents for less energy-efficient buildings, and occupancy rates are reported to be higher by the CoStar Group[2], which released a study on rents, sales, and occupancy for energy efficient buildings in their commercial property database.

In a study from the New Buildings Institute (NBI), it was reported that building performance averages are 25-30 percent more efficient for LEED certified buildings than non-LEED buildings, and gold-platinum LEED rated buildings are 45 percent more efficient than the national average, which approaches the interim goals of Architecture 2030, (a non-profit organization dedicated to reducing GHG emissions by changing the way developments are planned, designed, and constructed). The NBI study also shows a good correlation between modeled and actual building performance, providing assurances to developers and regulators that these measures will be effective. Additional information on energy efficiency/renewable rating systems is available at a number of websites including: http://www.buildinggreen.com/, http://energystar.gov/, www.architecture2030.org/. For new construction, core and shell, and commercial interiors relating to LEED certified buildings, information is available on the following website: http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222. In addition, for a Massachusetts perspective, consultation with green building experts can be obtained through the Green Building Roundtable: http://www.greenroundtable.org, located in Boston.

Although it is unnecessary to provide a complete technological and financial analysis of all GHG reduction mitigation measures, it will benefit the proponent to use functional and quantitative analyses and mock ups to assess feasible greenhouse gas reduction measures for the project type, starting with measures that offer the greatest energy reductions, and then considering opportunities to improve ongoing operations. These assessments should either lead to commitments to adopt the LEED and/or Energy Star elements, or the EIR should do a credible job in explaining why a particular efficiency or green power generation component is impracticable. Since there is, for example, no demonstration in the EENF that it would be

[2] The full study can be viewed at the CoStar Group Inc. website: http://www.costar.com/news/Article.aspx?id=D968F1E0DCF73712B03A099E0E99C679. CoStar Group Inc. is an information services organization serving commercial real estate in the United States and the United Kingdom.

technically infeasible or cost prohibitive to incorporate solar (photovoltaic) power on-site to generate energy for some of the building's functions, the EIR should consider the feasibility of implementing alternative energy sources for the project. Alternatively, there is no analysis of or commitment to purchasing power generated by renewable energy sources for any portion of the electricity use on the site.

Even if on-site power generation is not feasible, many projects now routinely commit to orienting and designing buildings for energy efficiency, and to its credit, this project has proposed to incorporate energy efficient lighting, increased roof and duct insulation, energy efficient windows, duct insulation, and high-albedo roofing materials. Other energy efficient measures, as explained below, also need further consideration. Additional information on building design energy reduction measures and standards is available on many websites, including the following: http://www.eere.energy.gov/, http://www.nahb.org,www.sbicouncil.org, http://www.aceee.org, http://www.ashrae.org/, http://www.coolroofs.org/ and http://www.ornl.gov.

Consistent with the GHG Policy, the EIR should model at least one mitigation alternative that would result in greater GHG reductions than the preferred alternative. Alternatives with greater energy efficiencies allow an understanding of potential opportunities for energy savings achievable by varying building design and layout strategies. Energy efficient techniques not selected should be explained, and this information assists in the determination that the alternative selected has avoided, minimized, and mitigated CO_2 emissions.

DOER reviewed the EENF and notes that in general, the proponent's energy model must be optimized for the Massachusetts Building Code, which is the baseline alternative for energy usage in calculating GHG emissions, as explained in the MEPA Greenhouse Gas Emissions Policy and Protocol. Also, it is recommended that the project proponent contact the New Construction division of its natural gas and electricity utility in Lowell, National Grid, to take advantage of potential rebates available for the installation of highly energy efficient equipment.

DOER has identified several measures worthy of consideration in the subsequent filing, and adoption into the project, where feasible, as detailed below. In the event that the proponent is not able to adopt one of these measures, the subsequent filing must provide technical and cost analyses to document the rationale for not making a commitment to a mitigation recommendation.

High-Efficiency HVAC Systems – The subsequent filing needs to provide more information regarding the HVAC system, including the gas heating system, for all of the building types. Without more information, it is not possible to evaluate whether or not the system being proposed is highly efficient based on an Energy Efficiency Ratio (EER) of 11.5. It should be noted that more efficient units provide definite economic benefits over the life of the system.

Energy Efficient Exterior Lighting – The EENF notes that the project will use "efficient and directed" exterior lighting. The subsequent filing needs to provide more information to be able to determine if it is highly energy efficient.

Duct Insulation – The EENF notes that insulation will be wrapped around the air supply ducts to reduce energy losses. Duct insulation is the baseline required by code. To enhance efficiency, the subsequent filing should note, and construction should reflect, that all ducts will be sealed with mastic, tested and then insulated, since duct leakage can be a major factor in energy losses.

Maximize Interior Daylighting – Table 6 of the EENF notes interior day lighting as inappropriate to the project. This should be revisited, noting that interior day lighting is currently being designed into office and retail spaces.

Third Party Building Commissioning – Table 6 of the EENF notes third party building commissioning as technically infeasible to the project. The Massachusetts Building Code requires building commissioning, but it should be performed by a third party to ensure the commissioning process is thorough and energy performance of the building is maximized.

Building Energy Management Systems - Table 6 of the EENF indicates that motion sensors in lighting and climate control and tracking energy performance of the building and development to maintain efficiency would be inappropriate for this project. Motion sensors and lighting controls should be installed in all non-residential spaces. In addition, to ensure that the energy systems function as designed long term, a strategy should be developed for monitoring energy performance of all buildings where the energy systems are centrally controlled, possible through a building management system. A building energy management system can incorporate basic energy saving measures such as lighting and climate control. A system for monitoring energy performance would be expected to pay for itself by eliminating potential inefficient building energy operations, such as simultaneous operation of heating and cooling systems in January.

The EENF also indicates that the project will meet LEED ND, which includes a commitment to meet Credit 2 for green construction and technology, and energy efficiency. Combined, the project will strive to demonstrate a ten percent improvement in building energy performance. However, these improvements cannot be demonstrated without a system or strategy in place for monitoring energy performance.

Roof and Wall Insulation - The subsequent filing should evaluate using R-38 insulation rather than R-30 in the building walls and R-19 for the roof reported in the EENF. In general, insulation is very cost effective, and contributes significantly towards a building envelope that has the potential to yield the largest energy savings for building operations.

Incorporate on-site renewable energy sources into projects – The EIR needs to explain and provide plans for onsite renewables, because there appears to be contradictory information in Table 6 of the EENF, which indicates that on-site renewable energy sources are inappropriate for the project, and information that the project would achieve LEED ND with Credits 11 and 13 for solar orientation and on-site renewable energy sources, respectively. Credit 11 notes that "blocks" along the canal will be south facing and provided with passive and active solar strategies, and for Credit 13, the proponent hopes to incorporate solar and wind. This information is contradictory to the information in Table 6.

At a minimum, roofs for new buildings should be constructed to support the added weight of a solar photovoltaic (PV) system for potential installation during project construction or at a future date. The proponent is commended for incorporating high-albedo roof materials into the project. Due to added reflectivity with high-albedo roofs, rooftop PV system operates even more efficiently, Considering the support of subsidies through the Commonwealth Solar and RPS programs, a life-cycle cost analysis should be done to evaluate the installation of a PV system during project construction under two scenarios: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party that will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. If neither of these scenarios is economically feasible at this time, the project should continue to consider the opportunity for installing PV at a future date and state their willingness to host a third-party owned PV array under a favorable power purchase agreement.

Water-source heat pumps are another potential way to incorporate renewable energy into this project. Given the location of the site near the Lowell canals, a water-source heat pump could provide energy for heating and cooling of the buildings proposed.

Although the main sources of GHG associated with this proposed project include building heating and cooling, lighting, and vehicle travel to and from the proposed development, the energy required to provide potable water and treat wastewater also will be a source of GHG. To gain an understating of the correlation between water/wastewater volumes and energy use requirements, MassDEP has considered major utilities in the state and reviewed relevant research. For example, the Massachusetts Water Resources Authority (MWRA) estimates the average energy cost wastewater treatment at their Deer Island facility is 1.2 - 1.4 kWh/kgal. Similarly, a study of wastewater treatment plants in Wisconsin found that 1.5 kWh/kgal was required to treat wastewater in that state's wastewater treatment plants. This proposed development will generate approximately 97,320 gallons of wastewater per day or approximately 35,521,800 million gallons per year. Using an average energy cost of 1.3 kWh/kgal the project will require approximately 35,522 kWh over the course of a year. The project proponent should consider this additional energy use when proposing measures to mitigate the additional GHG emissions that will result from treating wastewater from this proposed project.

In addition, the MWRA estimates that treating and transporting drinking water at their John Carrol Water Treatment Plant requires 0.14 to 0.23 kWh/kgal. This is slightly less than the estimated 0.3 kWh/kgal required to treat and transport drinking water at the Worcester Water Filtration facility. As noted in the EENF, the proposed project will require 107,050 gallons of potable water per day, or 39,073,250 gallons per year. Using energy costs of about 0.2 kWh/kgal, approximately 21,410 kWh will be required to supply the proposed project with potable water annually. As with wastewater, the project proponent should consider this additional energy use when proposing measures to mitigate the additional GHG emissions that will result from providing potable water for this proposed project. Mitigation measures for water and wastewater may include improvements to the distribution systems for the public water supply to eliminate un-accounted for water losses and infiltration and inflow (I/I) removal from sewer mains, in addition to water conservation measures.

In summary, the EIR needs to show that the preferred alternative would achieve significant reductions in GHG emissions with building designs, selection of building materials, and water and sewer infrastructure upgrades and efficiencies that reduce and/or offset the fossil fuel energy demand of the project. Revised GHG emissions modeling for this project should include for reconsideration the mitigation measures identified herein, in order to quantify the additional emissions reductions that are potentially achievable. In the event that the proponent is not able to adopt any of these measures, the EIR should provide technical and cost analyses to document the rationale for not making a commitment to a mitigation recommendation.

Construction and Demolition Waste Reduction

The project includes demolition and reconstruction, which will generate a significant amount of construction and demolition (C&D) waste. The Urban Design section commits to recycling 50 percent of construction debris, as a sustainable measure for the project.

The project proponent is advised that demolition activities must comply with both Solid Waste and Air Pollution Control regulations, pursuant to M.G.L. Chapter 40, Section 54, which provides:

> Every city or town shall require, as a condition of issuing a building permit or license for the demolition, renovation, rehabilitation or other alteration of a building or structure, that the debris resulting from such demolition, renovation, rehabilitation or alteration be disposed of in a properly licensed solid waste disposal facility, as defined by Section one hundred and fifty A of Chapter one hundred and eleven. Any such permit or license shall indicate the location of the facility at which the debris is to be disposed. If for any reason, the debris will not be disposed as indicated, the permittee or licensee shall notify the issuing authority as to the location where the debris will be disposed. The issuing authority shall amend the permit or license to so indicate.

For purposes of implementing the requirements of M.G.L. Chapter 40, Section 54, MassDEP considers an asphalt, brick, and concrete (ABC) rubble processing or recycling facility, pursuant to the provisions of section (3) of 310 CMR 16.05 Site Assignment Regulations for Solid Waste Management Facilities, to be conditionally exempt from the site assignment requirements if the ABC rubble at such facilities is separated at the point of generation from other solid waste materials. Under 310 CMR 16.05(3), ABC can be crushed on-site with just a 30-day notification to MassDEP. However, the asphalt is limited to weathered bituminous concrete (no roofing asphalt) and the brick and concrete must be uncoated or not impregnated with materials such as roofing epoxy. If the brick and concrete are not clean, e.g., coated and/or impregnated, the material is defined as construction and demolition (C&D) waste and requires either a Beneficial Use Determination (BUD) or a Site Assignment and permit before it can be crushed.

Pursuant to the requirements of 310 CMR 7.02 of the Air Pollution Control Regulations, if the ABC crushing activities are projected to result in the emission of one ton or more of particulate matter to the ambient air per year and/or if the crushing equipment employs a diesel oil fired engine with an energy input capacity of three million or more British thermal units per

hour for either mechanical or electrical power which will remain on-site for twelve or more months, then a plan application must be submitted to MassDEP for written approval prior to installation and operation of the crushing equipment.

In addition, if it appears that significant portions of the demolition project contain asbestos, the project proponent is advised that asbestos and asbestos-containing waste material are a special waste as defined in the Solid Waste Management regulations (310 CMR 19.061). Asbestos removal notification on permit form ANF 001 and building demolition notification on permit form AQ06 must be submitted to MassDEP at least 10 working days prior to initiating work. Except for vinyl asbestos tile (VAT) and asphaltic-asbestos felt and shingles, the disposal of asbestos containing materials within the Commonwealth must be at a facility specifically approved by MassDEP (310 CMR 19.061). No asbestos containing material including VAT, and/or asphaltic-asbestos felts or shingles may be disposed at a facility operating as a recycling facility, (310 CMR 16.05). The disposal of the asbestos containing materials outside the jurisdictional boundaries of the Commonwealth must comply with all the applicable laws and regulations of the state receiving the material.

The demolition activity also must conform to current Massachusetts Air Pollution Control Regulations governing nuisance conditions at 310 CMR 7.01, 7.09 and 7.10. As such, the proponent should propose measures to alleviate dust, noise, and odor nuisance conditions, which may occur during the demolition. MassDEP must be notified in writing, at least 10 days in advance of removing any asbestos. MassDEP also must be notified in writing, at least 10 days prior to any demolition work. The removal of asbestos from the buildings must adhere to the special safeguards defined in the Air Pollution Control Regulations (310 CMR 7.15 (2)).

Materials Management

MassDEP commends the applicant for recognizing the importance of materials management within its EENF filing for the Hamilton Canal District project. In order to address GHG emissions related to materials management in the EIR, MassDEP requests that the applicant quantify the GHG impacts of materials management for the project development and projected future operation. By quantifying these impacts, the applicant's GHG mitigation efforts related to materials management can be more clearly identified and targeted appropriately. MassDEP seeks quantification to help guide changes in the project, which provide a comprehensive approach to materials management throughout the design, construction, and operational phases of the project. There are a number of resources available to help quantify GHG impacts associated with efficient materials management, including the USEPA Warm Model, available at the following website: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html, and the Building Reuse Calculator at: http://www.wastematch.org/calculator/calculator.htm.

During the **design phase**, MassDEP requests the applicant address waste reduction, environmentally preferable materials use, and the need to design for the storage and collection of recyclables. In order to plan for waste reduction, the applicant should consider implementing a waste prevention purchasing policy, which may include management options for reducing shipping and packaging materials, and if necessary, managing excess materials through unused

product return or donation. MassDEP also requests that the EIR provide the following information:

- a list of the environmentally preferred products to be used,
- the GHG impacts of using these materials, and
- an explanation for why an expanded commitment to use additional EPP materials (including on-site use of demolition materials, regionally produced materials, recycled content materials) is not applicable or cannot be confirmed.

MassDEP appreciates that the applicant will be providing for the storage and collection of recyclables, but requests that more specific information be provided on the square footage of the proposed storage area and the types of materials expected to be stored and recycled. The EIR should, at a minimum, demonstrate that the storage area would be sufficient to manage waste materials currently prohibited from disposal in Massachusetts. A list of these materials can be found on the MassDEP website: http://www.mass.gov/dep/recycle/solid/regs0201.htm. In addition, MassDEP requests that the applicant identify how hazardous materials generated during facilities' operations, e.g., spent fluorescent bulbs, lubricants, waste oil, and other hazardous materials, would be managed and stored.

During the **construction phase**, MassDEP recommends that the applicant's material management efforts focus on material reuse and recycling. MassDEP requests the applicant commit to developing a construction waste management plan that fully complies with the Massachusetts Waste Bans and establishes a minimum reuse/recycling goal of 50 percent. The Department has demonstrated through pilot construction projects that this planning results in significant reductions in waste and cost savings for developers. Information and resources to assist in the development and implementation of a construction management plan can be found at http://www.mass.gov/dep/recycle/reduce/managing.htm#project.

In the **operations phase,** the applicant should develop and implement a waste management plan to ensure compliance with the MassDEP Waste Bans. The Department offers resources to assist in this area including planning tools, contracting language, and lists of service providers (http://www.mass.gov/dep/recycle/reduce/assistan.htm#reduce). The waste management plan should establish a target-recycling goal of more than 50 percent. This level of recycling has been achieved consistently in similar projects with demonstrated operational cost savings and capital asset appreciation benefits.

Mobile Source (Transportation)

The proposed, multi-phased development of mixed-use, transit-oriented development (TOD) is estimated to generate more than 10,000 trips per day (tpd). The analysis of the proposed project included three scenarios consisting of interim Phase I, 2012 Build and No Build project conditions and 2017 Build and No Build project conditions. These comments pertain to the 2017 Build conditions compared with the 2017 No Build conditions.

Mesoscale Analysis

The projected new daily vehicle trips exceed the MassDEP review threshold of 6,000 daily trips for mixed-use projects that require an air quality mesoscale analysis. The EENF

provides an analysis comparing the indirect emissions from transportation sources under various build and no build conditions. The purpose of the mesoscale analysis is to determine the potential for a project to increase volatile organic compounds (VOCs) and nitrogen oxides (NOx) emissions in the project study area. In addition, the analysis helps identify mitigation measures and transportation demand management (TDM) measures to reduce project-related trips and associated emissions.

The mesoscale analysis predicted VOC and NOx emissions using the current USEPA emission model (MOBILE 6.2) and traffic flow conditions for the 2007 Existing, 2017 No Build, 2012 Phase I conditions, and 2017 Build and Build with Mitigation conditions. The modeling results indicate an 8.8 percent increase of NOx and VOC emissions under the 2017 Build condition compared to the 2017 No Build condition. To address the increase, the proponent has committed to several traffic mitigation measures and TDM measures. According to the EENF, the combined benefit of the proposed mitigation package accounts for a five percent reduction in the project's average daily traffic, which results in less than a one percent reduction in NOx and VOC emissions.

Greenhouse Gas Analysis

The GHG Policy requires project proponents to quantify their carbon dioxide (CO_2) emissions and identify measures to avoid, minimize, and mitigate these emissions. The following comments address the indirect emissions from transportation in accordance with the GHG Policy.

The mesoscale analysis described above also is used to estimate the indirect emissions from transportation generated CO_2 emissions associated with vehicle trips. The calculation compared CO_2 emissions for the 2007 Existing condition, the 2017 No-Build condition, and the 2017 Build and the 2017 Build with Mitigation conditions. The analysis estimated that the 2017 Build condition produces 959.2 tons per year (tpy) compared with 910.7 tpy produced by the 2017 Build with Mitigation condition. The EENF reports that the estimated five percent reduction of CO_2 emissions is a result of the combined traffic mitigation measures and TDM measures as described in Sections 2.1.4 and 2.2.4.3 of the EENF.

MassDEP accepts the modeling assumptions and accuracy of the analysis and results. However, MassDEP also believes that the level of estimated CO_2 reductions does not adequately meet the GHG Policy requirements to identify measures to avoid, minimize, and mitigate these emissions. While MassDEP is not recommending a particular threshold of acceptable CO_2 emission reductions, analyses from comparable projects have estimated that mitigation programs could achieve approximately a ten percent reduction in overall mobile source CO_2 reductions.

The EENF commits to a reasonable list of traffic mitigation and TDM measures, but the project's commitment to several other TDM measures is vague or otherwise rejected by the project proponent as "inappropriate to the project type." Table 7 of the EENF contains a list of several mitigation measures that the proposed project has deemed inappropriate to the project type:

- Purchase alternative fuel and/or fuel efficient vehicles for fleet,

- Support expansion of parking at Park and Ride or transit stations,
- Pursue opportunities to minimize parking supply through shared parking,
- Subsidize transit passes,
- Use of pre-tax dollars for HOV commuting costs,
- Provide on-site amenities such as banks, dry cleaning, food service and childcare,
- Make on and off-site improvements to reduce VMT.

MassDEP is concerned that despite the proposed mitigation program and a ten percent trip reduction credit for TOD, the project still would generate a very significant number of vehicle trips per day (over 10,000 tpd). To ensure the efficacy of the TDM program, MassDEP recommends that the proponent identify the appropriate responsible party for each TDM commitment. Details on the TDM measures implementation plan also should be provided. Further, MassDEP strongly recommends that the project proponent reconsider the project mitigation measures listed above as part of the project's mitigation plan. MassDEP believes that an enhanced mitigation package designed to reduce VMT would be effective in further reducing the VOC, NOx, and CO_2 emissions generated. A key element of the proposed project should be improving the linkage to nearby transit facilities. The project site's accessibility to the Gallagher Terminal containing the Lowell commuter rail and Kennedy Bus Center Transfer Center should be optimized. The proponent also should work closely with the Lowell Historic National Park to expand its existing trolley system as appropriate to serve the project site. Strengthening the TOD aspects of this project will reduce project trip generation to a greater extent than the proposed combined mitigation program.

Recommended Transportation Demand Management (TDM) Measures

The project proponent also should consider implementing the following recommended measures to further reduce vehicle trips within the project study area.

- *On-Site Vehicle Trip Reduction Coordinator* - MassDEP recommends that the proponent designate an on-site vehicle trip reduction coordinator to implement, promote, and follow up on the use of the mitigation trip reduction measures.

- *Commuter Tax Benefit Program* - This transportation tax benefit program encourages employees to take transit or vanpools to work, providing transit and bus services are available within a mile of the project site. This program has the added benefit of decreasing taxes for employers and employees.

- *Rideshare-Matching Program* - MassDEP recommends that the proponent establish a rideshare-matching program to match employees in carpools and/or vanpools. The proponent also could enlist the services of a third-party provider to carry out this program.

- *Form or Join an Existing Transportation Management Association (TMA)*- TMAs are organizations that help several employers in a local area develop and implement incentives that reduce traffic and trips to the worksite. An employer pays a fee for the services of a centralized coordinator for marketing and implementing incentives on an employer's behalf.

- *Guaranteed Ride Home Program* - MassDEP recommends that the proponent establish an emergency ride home program for all project employees traveling by carpools/vanpools.

- *Additional Bicycle Incentives* - MassDEP recommends that the proponent install adequate locker and shower facilities and secure bicycle storage suitable for the various building uses on the site to increase bicycle use.

- *Preferential Parking* - MassDEP also recommends that the proponent designate special, preferred parking spaces for carpools and/or vanpools as an incentive to encourage people to rideshare to work.

- *Parking Management* - Develop a parking management program to minimize parking demands, such as parking cash-out, parking charges, limiting parking available to employees, and preferential carpool and vanpool parking.

In addition to the recommendations above, the project must meet the following requirements.

Compliance with the Massachusetts Idling Regulation

MassDEP appreciates the proponent's commitment to comply with the Massachusetts Idling regulation (310 CMR 7.11). The regulation prohibits motor vehicles from idling their engines more than five minutes unless the idling is necessary to service the vehicle or to operate engine-assisted power equipment (such as refrigeration units) or other associated power. The proponent should post idling restriction signs in all loading and drop-off areas within the site to remind all drivers, patrons, and delivery personnel of the state's idling regulation. Questions about this regulation should be directed to Julie Ross of MassDEP at 617-292-5958.

Compliance with the Massachusetts Rideshare Regulation

MassDEP is pleased to see the commitment to comply with the Rideshare regulation (310 CMR 7.16). This regulation applies to employers with 250 or more employees daily. Employers subject to the Rideshare Program must implement a series of incentives that are designed to reduce the number of trips made by employees who drive alone to work. To date, employers with 1,000 or more employees and employers with 250 or more employees that also are subject to the Air Operating Permit Program, as detailed in MassDEP regulation, (310 CMR 7.00), must comply with the Rideshare regulation. Questions about compliance with this air quality program regulation should be directed to the MassDEP Rideshare Helpline at 617-292-5663.

Construction Period Air Quality Mitigation Measures

MassDEP recommends that project proponent commit to requiring all project contractors to install after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). MassDEP commends the project proponent for committing to installing these devices to reduce engine emissions. MassDEP's guidance document, *Diesel Engine Retrofits in the Construction Industry – A How to Guide,* is available on MassDEP's website at http://www.mass.gov/dep/air/diesel/conretro.doc.

As of June 2007, all standard off-road diesel fuel must have no more than 500-ppm sulfur, (low sulfur diesel fuel (LSD)), and in 2010 the maximum sulfur level in off-road fuel will be reduced to 15 ppm, (ultra-low sulfur diesel (ULSD) fuel). Given the current availability of ULSD, MassDEP recommends the use of ULSD fuel to reduce additional amounts of fine particulate matter, which is associated with the state's high incidence of asthma and is a probable carcinogen.

The MassDEP appreciates the opportunity to comment on this proposed project. Please contact Marc Laplante, Project Point of Contact, at (978) 694-3246 or Marc.LaPlante@state.ma.us for further information on permitting issues. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338 or Nancy.Baker@state.ma.us.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Gerry Bingham, Meg Lusardi, EEA/DOER
Phil Weinberg, Nancy Seidman, Christine Kirby, John Felix, Richard Blanchet, Ben Lynch, Greg Cooper, Dave Slagle, Jerome Grafe, Alissa Bilfield, MassDEP-Boston
Richard Chalpin, Eric Worrall, Marc LaPlante, Kevin Brander, Joanne Fagan, John Macauley, Rachel Freed, Jill Provencal, Jack Zajac, MassDEP-NERO

The Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs
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Deval L. Patrick
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December 31, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY & ENVIRONMENTAL AFFAIRS
ON THE
SINGLE ENVIRONMENTAL IMPACT REPORT

PROJECT NAME:	Reading Woods
PROJECT MUNICIPALITY:	Reading
PROJECT WATERSHED:	Boston Harbor
EEA NUMBER:	14252
PROJECT PROPONENT:	Jacob Way LLC c/o National Development
DATE NOTICED IN MONITOR:	November 24, 2008

As Secretary of Energy and Environmental Affairs, I hereby determine that the Single Environmental Impact Report (Single EIR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

Project Description

As described in the Single EIR, the project consists of the redevelopment of tbe 24.8-acre Addison-Wesley-Longman office/warehouse complex into a mix of residential, senior living, and office space. The project site is located at the Route 128/Route 28 interchange (exit 38) and presently contains 208,000 square feet (sf) of office/warehouse space in six buildings. The project entails the construction of 202 apartment units in two buildings (including 41 affordable units) in compliance with the Commonwealth's 40R Smart Growth Zoning allowance in Reading's newly established Gateway Smart Growth District; 142 senior independent and assisted living units; 16 townhouses; and, 160,000 sf of Class A office space. A total of 1,064 parking spaces will be provided on-site, 240 of which will be located in a structured garage. Average daily domestic water consumption and wastewater generation rates are estimated to be 70,040 gallons per day (GPD) each. The project is expected to generate approximately 405 total

vehicle trips during the weekday morning peak hour and 425 vehicle trips during the weekday evening. The project is expected to generate approximately 3,890 vehicle trips on an average weekday.

Jurisdiction and Permitting

This project is subject to MEPA review because it requires a State agency action and will generate 3,000 or more new average daily trips on roadways providing access to a single location (301 CMR 11.03(6)(a)(6)). The project will require an Indirect Vehicular Access Permit from the Massachusetts Highway Department (MassHighway) for impact to state-controlled roadways. The project will also require a Sewer Connection/Extension Permit from the Massachusetts Department of Environmental Protection (MassDEP). Coverage under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the U.S. Environmental Protection Agency will be required. Finally, the project must obtain an Order of Conditions from the Reading Conservation Commission, or in the case of an appeal, a Superseding Order of Conditions from MassDEP. The project is subject to the EEA/MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol.

The project will receive financial assistance from the Massachusetts Department of Housing and Community Development in accordance with M.G.L. Chapter 40R – Smart Growth Zoning and Housing Production Bylaw. Therefore, MEPA jurisdiction for this project is broad and shall extend to all aspects of the project that are may directly or indirectly cause Damage to the Environment as defined in the MEPA regulations.

Review of the Single EIR

The Single EIR included a detailed description of the proposed project, including a discussion of minor modifications made to the building program between the filing of the Expanded Environmental Notification Form (EENF) and the Single EIR. Notable modifications include the enhancement of sustainable and energy efficient design measures to substantially reduce project-related GHG emissions. The Single EIR characterized both existing and proposed site conditions, the context of the project with local land uses and zoning, and contained a list of required permits and approvals associated with the project. The Single EIR included a response to comments section addressing comment letters received on the EENF.

Traffic

The Single EIR included a traffic study that generally conforms to the EOEEA/EOTPW Guidelines for Traffic Impact Assessment. The Single EIR included a commitment to a Transportation Demand Management (TDM) program and several intersection improvements to offset traffic generated by the project. The Single EIR contained intersection improvement plans at 80-scale and acknowledged the responsibility of future noise abatement measures, if necessary. Specific mitigation commitments have been outlined in the Mitigation section of this Certificate.

Greenhouse Gas Emissions (GHG)

The Single EIR presented a modified Preferred Alternatives that achieved greater GHG reductions than those proposed in the EENF. The Single EIR included the results of an updated GHG analysis prepared in accordance with the EEA Greenhouse Gas Policy and Protocol and the Scope on the EENF. The Single EIR noted that all of the GHG emissions presented in the updated analysis were substantially higher than those presented in the EENF due to a revised review methodology that allowed for more accurate measurements of GHG emissions and reduction measures. I commend the Proponent for responding thoroughly to MassDEP and the Division of Energy Resource's (DOER) comment letter on the EENF within both the Single EIR and in a supplemental memorandum submitted on December 10, 2008.

The updated GHG analysis evaluated GHG reduction measures, provided supporting modeling data, specified which GHG reduction measures would be implemented on-site, and clarified why certain measures were chosen while others were discarded in the final design. The Single EIR described the evaluation of numerous stationary source GHG reduction measures including: evaluating the project's components with the Advanced Buildings Core Performance Guide, the potential benefits of utility rebates, building orientation and roofing materials, use of high efficiency HVAC systems, use of energy efficient lighting, duct insulation, third party commissioning, building energy management systems, roof and wall insulation, renewable energy sources (both photovoltaic (PV) and wind), district heating and cooling, water conservation and wastewater reduction efforts, and tenant sustainability guidelines.

The updated GHG analysis included modeling data that reflected the commitments made by the Proponent to reduce stationary and mobile source GHG emissions from the project. The Single EIR used the EQUEST model to compute direct and indirect CO_2 emissions from stationary sources and the U.S. EPA's COMMUTER model Version 2 to estimate changes in CO_2 emissions due to roadway mitigation and traffic demand management measures.

As can be seen in the following Table, under the 2012 Build Condition, CO_2 emissions are expected to increase by 5,014.0 tons per year (tpy) from the No-Build Condition. With recommended mitigation measures the reduction in stationary source emissions is 1,160.8 tpy, a 21.5 percent reduction, and the overall project CO_2 emissions are estimated to be reduced by 1,211.8 tpy, a 4.0 percent reduction.

GHG Analysis	2007 Existing Condition	2012 No-Build	2012 Build	2012 Project Emissions	2012 Reductions Due to Project Mitigation	2012 Build with Mitigation Condition	Percent Reduction of Project Mitigation to Project Emissions
Mobile Sources	19,245.0	24,047.8	24,671.8	624.0	-51.0	24,620.8	0.21%
Direct/ Indirect Stationary Sources	1,005.1	1,005.1	5,395.1	4,390.0	-1,160.8	4,234.3	21.5%
Total	20,250.1	25,052.9	30,066.9	5,014.0	-1,211.8	28,855.1	4.0%

(All data expressed in tons per year)
Source: Single EIR Tables 5-1 and 5-2

The Single EIR presented an evaluation of the viability of a PV system on the project site. This evaluation included a discussion of the limitations of a PV system due to the lack of PV incentives and rebates, as the site is serviced by the Reading Municipal Light District, which does not contribute to the Commonwealth's Renewable Energy Trust. The Single EIR and supplemental memorandum contained an estimate of cost and potential revenue generation for 50kW system for the office component. A 500kW system to service the entire site was also considered, but quickly determined to be impractical. The calculations for the 50kW system concluded that with an assumption of full tax credit benefits and no rebate savings, the system would have a negative net present value (NPV) and a 22-year simple payback. Therefore, the Proponent has decided not to pursue a PV system at this time. However, I encourage the Proponent to continue to investigate the feasibility of utilizing a third-party power purchase agreement for the installation of a solar PV system, as this may be an opportunity to further reduce GHG emissions if found economically feasible. In addition, the Climate Protection and Green Economy Act, M.G.L.c. 21N, mandates economy-wide reduction targets for greenhouse gas emissions in Massachusetts of between 10 and 25 percent by 2020. I encourage the Proponent to construct the facility with consideration for the added weight of future PV systems so that they may be installed in the future based upon tenant needs.

The Single EIR also discussed mobile source GHG reduction efforts including intersection improvements to improve traffic flow, TDM measures, and a commitment to fund a portion of the proposed Reading Shuttle bus as noted in the Mitigation section of this Certificate. The commitment to TDM measures were considered in the GHG modeling for the mobile sources of CO_2 associated with the project.

Upon completion of construction, the Proponent should provide a certification to the MEPA Office signed by an appropriate professional (e.g., engineer, architect, general contractor) indicating that the all of the mitigation measures referenced in the Section on Mitigation and Section 61 Findings below, or equivalent measures that collectively will reduce stationary source GHG Emissions by 21.5 percent and mobile GHG emissions by 0.21 percent, have been incorporated into the project. The certification should be supported by as-built plans. For those measures that are operational in nature (i.e. TDM, recycling) the Proponent should provide an updated plan identifying the measures, the schedule for implementation and how progress

towards achieving the measures will be obtained. MassHighway should incorporate this self-certification requirement into its Section 61 finding for both the mobile and stationary source GHG emission components of this project.

Wetlands

The Single EIR included a discussion of the two wetland resource areas located on the project site and their relationship to the proposed development. Wetland #1 is a Bordering Vegetated Wetland (BVW) that occurs in a stormwater detention area constructed during the original site development and is regulated under the Massachusetts Wetlands Protection Act (WPA). Wetland #2 is a regulated Fresh Water Wetland subject to the Reading Wetland Protection Regulations, but is not regulated under the WPA. Each wetland resource area was characterized and the Single EIR discussed the significance of the wetlands in accordance with the Massachusetts Wetlands Protection Act.

Stormwater

The Single EIR presented an assessment of the existing and proposed drainage conditions on the project site, described the stormwater management system, and discussed compliance with the MassDEP Stormwater Management Regulations. Stormwater Best Management Practices (BMPs) proposed include: deep sump catch basins, oil/grit separators, Stormceptor® Water Quality units, sediment forebays, vegetated drainage channels, water quality swales, bioretention areas and rain gardens, gravel wetlands, StormTech® chamber systems, and infiltration basins. Several of these BMPs are consistent with the goals of Low Impact Development (LID) stormwater management techniques. The Proponent committed in the Single EIR to develop and implement a long-term operation and maintenance plan for the stormwater management system. The Proponent will also prepare and implement a Stormwater Pollution Prevention Plan in accordance with the U.S. EPA's NPDES General Permit requirements.

Wastewater

The Single EIR included revised wastewater flow calculations, further detail of the existing and proposed sewerage collection system and planned project Inflow and Infiltration (I/I) mitigation funding. Factoring for water conservation measures, the Single EIR estimated wastewater flows at 60,636 GPD. Given the previous flows of 15,600 GPD associated with the Addison-Wesley buildings, the net new wastewater flows are estimated to be 45,036 GPD. However, for purposes of MassDEP permitting no allowance (or credit) for water conservation is permitted, therefore the unadjusted maximum projected wastewater flow is estimated to be 70,040 GPD, with a net new flow of 54,440 GPD.

The Single EIR notes that the Proponent will be filing a Sewer Connection Permit with MassDEP for the full build new wastewater flow of 54,440 GPD. It is possible that individual buildings will be constructed in phases over time, therefore the Proponent will request that MassDEP allow the transfer of each parcel's portion of the required capacity (and mitigation) to the entity identified as the owner/controller of that parcel. The Single EIR included a discussion

of wastewater I/I removal efforts, including identification of possible locations for infrastructure improvements. The Single EIR detailed a sewer mitigation payment allocation and mitigation timing schedule based upon anticipated project phasing.

Water Supply

The Single EIR estimated water supply demand at 70,040 GPD, with consideration for conservation measures to be implemented on-site. Net new water demand was estimated at 54,440 GPD, based upon an historic water demand of 15,600 GPD. The Single EIR proposed the use of an existing on-site irrigation well, reducing potable water demand for landscaping purposes. This irrigation source has been proposed in lieu of potable water use or the reuse of grey water. The Single EIR described an integrated planning approach to water conservation efforts, including design, construction and operations measures to reduce water demand. Key conservation components include the sub-metering of utilities in rental units and the installation of high-efficiency fixtures.

Construction Period

The Single EIR included a discussion of construction phasing and mitigation, including construction hours, transportation impacts, and compliance with MassDEP's Solid Waste and Air Quality Control regulations during the construction period. The Single EIR notes that to the greatest practical degree, the Proponent will seek to engage a contractor familiar with participation in the MassDEP's Clean Construction Equipment Initiative.

Mitigation

The Single EIR included proposed mitigation and draft Section 61 findings for use by State permitting agencies. The Proponent has committed to the following mitigation measures which should be included in the agencies' Section 61 findings for the project:

Traffic

Proposed traffic intersection improvements include:

- Widening the South Street eastbound and westbound approaches to two lanes. This will allow for an exclusive left turn lane and shared through/right turn lane in each direction;
- Upgrading the traffic signal hardware at the intersection of Main Street/South Street; improve safety and reduce drive confusion by providing a left turn arrow designation for northbound traffic; and
- If desired by the Town of Reading, reconfiguring the intersection of South Street/Jacob Way to promote Jacob Way as the primary route to the site, with South Street as a minor street under stop sign control.

Components of the Travel Demand Management Program include:

- Partial funding of the proposed town of Reading shuttle service after opening Phase I of the development. The service will link neighborhoods to areas such as the Reading MBTA Commuter Rail station, the Public Library, Reading Memorial High School, the Senior Center, and the Walkers Brook Drive retail area. The Town of Reading has preliminarily agreed to revise the proposed routes and extend one of the routes to service the Reading Woods development;
- Partnering with MassRIDES to provide commuter services such as carpool and vanpool matching, guaranteed ride home programs, bike to work information, etc.;
- Designation of an on-site Transportation Coordinator;
- Promotion of ridesharing opportunities for employees, tenants and residents;
- Provision of bicycle storage racks;
- Provision of on-site services such as payroll direct deposit, lunch rooms, vending machines, etc., to reduce employee trips during the day; and
- Making commuter rail and shuttle bus schedules available for employees and residents.

Greenhouse Gas Emissions

The following stationary-source GHG mitigation measures have been proposed for the project:

- The project will qualify and apply for gas rebates offered by National Grid as applicable to the various land uses pertaining to gas heating, water heating, gas commercial kitchen equipment, and Energy Star thermostats;
- Orientation of all buildings on an east/west axis, with maximization of southerly exposure;
- Installation of high-albedo roofing materials on the multi-family and office buildings, with the use of lighter colored roofing materials on the sloped roofs of the Senior Housing and Townhouse buildings;
- Use of a cooling tower or Variable Refrigerant Volume (VRV) HVAC system for the Senior Housing component, a VRV HVAC system for the office component, and a through-wall ducted system (gas fired forced hot air and electric air conditioning) HVAC system for the apartments and townhouse component of the project;
- Use of energy efficient lighting in hallways and common areas of the residential buildings, along with circuitry to automatically turn off fixtures in common areas;
- Separate metering of all utilities (electricity, gas, water) in all apartment units, along with dedicated HVAC systems for each unit;
- Use of high efficiency metal halide light fixtures for office area exterior lighting;
- Introduction of a quality control program focused on the airtight installation of ductwork;
- Implementation of a commissioning process by the architect and mechanical/electrical/plumbing engineers for the Office project that focuses on the proper set-up and operation of the energy consuming building systems shortly after the building opens;

- Implementation of an Energy Management System for the Office component of the project under the Proponent's control (i.e., common areas and corridors);
- Installation of insulation in the Apartment, Senior Housing, and Townhouse buildings with an R-factor of up to R-19 in the walls and R-30 in the roofs;
- Installation of insulation in the Office building with an R-factor of up to R-19 in the walls and R-25 in the roofs; and
- Preparation of Tenant Sustainability Guidelines to create awareness amongst tenants of additional sustainable products and practices.

Wastewater

Proposed wastewater mitigation measures include:

- Inflow and Infiltration (I/I) payments to the Town of Reading in the amount of $435,520 per the project's Development and Infrastructure Agreement. Subsequent to studies prepared by Camp Dresser & McKee, Inc., on behalf of the Town of Reading: *Identification of Illicit Sewer System Inflow Building Inspection Program (January 2007)* and *Sewer Flow Monitoring (Draft) Report (April 2008)* the Proponent and the Town have agreed that I/I payments will be utilized to remove I/I from Area 2B; and
- Up to $50,000 as a one-time payment of supplemental funds if needed to address sewer I/I problems, sewer capacity limitations and to make enhancements to the public sewer mains within the Town of Reading.

Water Supply

- Sub-metering of utilities in individual rental units;
- Installation of low flow, high-efficiency faucets and low-flow water closets and urinals in the office building;
- Installation of low flow, high-efficiency faucets in the 160 apartment units, the 142 senior living units, and the 16 townhomes;
- Use of drought-tolerant landscaping; and
- Payment of buy-in fees to the Massachusetts Water Resources Authority (MWRA) water system, estimated at $312,000.

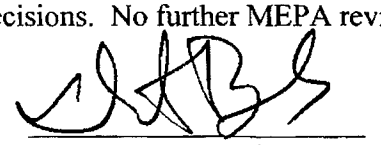
The Single EIR presented draft Section 61 findings that addressed traffic-related mitigation measures. These Section 61 findings must be expanded to include stationary-source GHG mitigation measures in accordance with the GHG Policy. The final Section 61 findings will be included with all state permits issued for this project, and will be considered binding upon the proponent as mitigation commitments. In accordance with Section 11.12(5)(e) of the MEPA regulations, final Section 61 findings must be forwarded by each permitting agency to the MEPA Office, which will publish a Notice of Availability in the Environmental Monitor.

As noted elsewhere in this Certificate, the Proponent should provide a certification to the MEPA Office signed by an appropriate consultant (e.g., engineer, architect, general contractor) indicating that the all of the above referenced mitigation measures have been incorporated into

the project. The certification should be supported by as-built plans. For those measures that are operational in nature (i.e. TDM, recycling) the Proponent should provide an updated plan identifying the measures, the schedule for implementation and how progress towards achieving measures will be obtained. MassHighway should incorporate this self-certification requirement into its Section 61 finding for both the mobile and stationary source GHG emission components of this project.

Conclusion

I find the Single EIR to be adequate and am allowing the project to proceed to the state agencies for permitting. The Single EIR contained adequate information on project impacts and mitigation, and provided the state permitting agencies with sufficient information to understand the environmental consequences of their permit decisions. No further MEPA review is required.



December 31, 2008
Date

Ian A. Bowles

Comments received:

12/24/2008 Massachusetts Department of Environmental Protection – NERO
12/24/2008 Executive Office of Transportation and Public Works

IAB/HSJ/hsj

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION

EOT

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

BERNARD COHEN
SECRETARY

December 18, 2008

Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114-2150

RE: Reading – Reading Woods - SEIR
(EOEA #14252)

ATTN: MEPA Unit
Holly Johnson

Dear Secretary Bowles:

On behalf of the Executive Office of Transportation, I am submitting comments regarding the proposed Reading Woods project in Reading, as prepared by the Office of Transportation Planning. If you have any questions regarding these comments, please call J. Lionel Lucien, P.E., Manager of the Public/Private Development Unit, at (617) 973-7341.

Sincerely,

David J. Mohler
Deputy Secretary for Planning

DJM/jll

TEN PARK PLAZA, BOSTON, MA 02116-3969
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cc: Luisa Paiewonsky, Commissioner
Frank Tramontozzi, P.E., Chief Engineer
Patricia Leavenworth, P.E., District 4 Highway Director
Neil Boudreau, State Traffic Engineer
PPDU files
MPO Activities files
Planning Board, Town of Reading
Metropolitan Area Planning Council
Boston Region Metropolitan Planning Organization

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION AND PUBLIC WORKS
OFFICE OF TRANSPORTATION PLANNING

MEMORANDUM

TO: David Mohler, Deputy Secretary for Planning
Executive Office of Transportation and Public Works

FROM: J. Lionel Lucien, P.E., Manager
Public/Private Development Unit

DATE: December 18, 2008

RE: Reading – Reading Woods – SEIR
(EOEEA # 14252)

The Public/Private Development Unit has reviewed the Single Environmental Impact Report (SEIR) for Reading Woods project in Reading. The proposed project entails the redevelopment of the 24.8-acre Addison Wesley-Longman campus that formerly contained approximately 208,000 square feet of office space in six buildings. The site is located adjacent to the I-95/Route 28 interchange with access to the site via Jacob Way. The site is generally bound by Route 28 to the east, South Street to the north, Curtis Street to the west, and I-95 to the south. The site had previously been reviewed in MEPA (EOEEA #12165) as a mixed-use development containing 600,000 square feet of office space, a 300-room hotel, and parking for 2,300 vehicles. While allowed under current zoning, this project was never constructed. As currently proposed, the development will consist of the construction of 202 apartment units in two buildings, 142 independent and assisted living units, 16 townhomes, 160,000 square feet of office space, and 1,601 parking spaces. Based on information provided in the SEIR, the project at full-build is expected to generate approximately 3,890 vehicle trips on an average weekday. The project categorically requires the preparation of an Environmental Impact Report (EIR) and will also require a MassHighway permit for indirect access to I-95.

The SEIR included a traffic study that generally conforms to the EOEEA/EOTPW Guidelines for Traffic Impact Assessment. The SEIR has analyzed the traffic and proposed mitigation measures that will address the project's impact on the state highway system. In order to mitigate the transportation-related impacts of this project, the proponent has committed to implement physical roadway and traffic control improvements at the following intersection locations:

- Route 28 (Main Street)/South Street
- South Street/Jacob Way

The proponent has also committed to implement a comprehensive transportation demand management (TDM) program aimed at reducing single occupant vehicle trips to and from the site. The TDM program includes designating an on-site transportation coordinator, a car/vanpool program, pedestrian infrastructure and bicycle facilities, and partial financial support for a shuttle bus that will link the development to the Reading MBTA commuter rail station, the public library and other locations. The SEIR includes an analysis of the greenhouse gas emissions impact of the project. This analysis shows that the proponent has made an adequate commitment to reducing greenhouse gas emissions through the proposed intersection improvements and TDM measures.

The proposed development abuts a planned highway improvement, associated with the reconstruction of the I-93/I-95 interchange, to expand I-95 from three lanes to four lanes in each direction. The planned expansion is expected to be accommodated within the existing right-of-way. We request that the proponent coordinate with MassHighway to ensure that the proposed project is designed to minimize impacts on this planned MassHighway project.

The SEIR includes a letter of commitment that will serve as the basis for MassHighway to issue a Section 61 finding for the project. If you have any questions regarding these comments, please contact Paul Nelson at (617) 973-7479.

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
205B Lowell Street, Wilmington, MA 01887 • (978) 694-3200

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

December 24, 2008

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Reading
Reading Woods
Jacob Way
EEA # 14252

Attn: MEPA Unit

Dear Secretary Bowles:

The Massachusetts Department of Environmental Protection (MassDEP) and the Executive Office of Environmental Affairs, Department of Energy Resources (DOER) have reviewed the Single Environmental Impact Report (SEIR) submitted by Jacob Way LLC c/o National Development to demolish six buildings within an office and warehouse park formerly occupied by Addison-Wesley Longman in order to construct two apartment buildings with 202 housing units, 142 units of senior housing and assisted living facilities, 16 townhouses, and 160,000 square feet of office space, and parking for 1,061 vehicles on a 24.8 acre site in Reading (EEA# 14252). The Department and DOER provide the following comments.

Stormwater

Information on the proposed stormwater management system is thorough and complete. The description of the stormwater system and best management practices is particularly helpful in explaining the drainage system components on the full size *Grading and Drainage Plan,* November 2008 (Figure 7.3). Although the SEIR is responsive to the issues of concern regarding stormwater impacts, the Department recommends reconsideration of the following issues.

1. The stormwater system design is proposing to use Stormceptor 450i units for drainage area 112b, (parking and courtyard), and drainage area 22 (senior living parking and emergency access). However this Stormceptor model was not evaluated and rated for use in Massachusetts by the Strategic Envirotechnology Partnership (STEP), and as such, the efficiency of that system for its proposed use must be submitted through the Stormwater Management Policy Handbook, Volume 2, Chapter 4, substantiating the very high total suspended solids (TSS) removal claims. MassDEP is not automatically crediting the 450i unit with either 55 percent or 77 percent TSS removal rates, which are the highest TSS removal rates accepted by Mass. STEP for other types of Stormceptor units. The STEP

fact sheet for Stormceptor units specifically excludes the 450i model; it states, "(t)he manufacturer has expanded the Stormceptor product line to include a storm drain inlet (STC 450i) and three units (Models STC 11000, STC 13000, and STC 16000). Users and decision makers may require additional field tests and new data for these new systems in order to accept performance ratings, particularly if they are higher than those reported in the STEP technology assessment and this fact sheet." The revised 2003 fact sheet and the Technology Assessment, Stormceptor CSR New England Pipe, January 1998 are available on the Stormwater Technology Clearinghouse website: http://www.mastep.net.

2. The TSS removal rates used for all Stormceptor units exceed the accepted rates. As explained in the previous comment, Stormceptor units are rated for either 55 or 77 percent TSS removal, if sized in accordance with the table provided in the referenced fact sheet.

3. The plans show the Stormceptor at DMH A1 to be a 900 unit. However, in the specification sheets in Appendix D (TSS calculation section), DMH A1 is identified as a Stormceptor 450i.

4. The drainage system shown on the plan for Jacob's Way appears to be incomplete without a piped connection to the system for the apartments/senior living parking area. Two sets of catch basins are shown in the main roadway for the project.

5. Although it has been demonstrated satisfactorily that the proposed groundwater recharge will exceed the required volume, the recharge calculation using the simple dynamic method does not appear to be consistent with the method described in the Stormwater Management Handbook, Volume 3, Chapter 1, page 19. According to the Handbook method, the simple dynamic volume is calculated by multiplying the minimum surface area of the bottom of the infiltration structure (A= Rv / (D +KT) by the depth of the infiltration facility (D).

Wastewater

The project's wastewater flow is estimated at 70,040 gpd. In calculating the infiltration and inflow reduction total of 223,720 gpd, and before applying the 4:1 I/I removal rate, the proponent has subtracted 15,600 gpd of existing wastewater flow, which reduces the increase in wastewater flow from the project to 54,440 gpd. The proponent estimates that I/I removal work would cost over $435,000. Funds will be transferred to the town of Reading to address I/I problems identified south of Lowell Street between Willow and Main streets, Area 2B, which was identified in a sewer flow monitoring report in April 2008.

According to the SEIR (page 11-15) the proponent plans to phase in I/I mitigation funding as the project construction is phased in. A sewer connection/extension permit is required from MassDEP because wastewater flow estimates for the project exceed the permit requirement of 50,000 gallons per day.

Greenhouse Gas Emissions (GHG)

The proponent is commended by MassDEP and DOER for the SEIR's responsiveness to comments and recommendations for adoption of more extensive GHG emissions reduction measures. As a result of the additional attention given to this issue in the SEIR, stationary source reductions have improved significantly. Increased energy efficient building and heating/cooling system designs proposed would lessen stationary sources of CO_2 by 21.5 percent, reflecting an improvement of about 17 percent from the CO_2 emissions reduction proposed in the Expanded Environmental Notification Form. Water use efficiency has been incorporated into the estimate of stationary direct and indirect source GHG reductions. In addition, the SEIR is insightful in its explanation of the proponent's deliberations on energy efficiency measures for the project, demonstrating that renewable energy was given thoughtful consideration even though a decision was made to exclude renewables from the project at this time.

The combined reduction of CO_2 emissions for stationary and mobile sources for the preferred alternative with GHG mitigation is estimated to be about 4 percent or 1211.8 tpy less than the base case alternative. The GHG calculations compared CO_2 emissions for indirect mobile sources under Existing, 2012 No-Build, 2012 Build, and 2012 Build with Mitigation conditions. Table 5.1 shows the results of the GHG analysis of indirect emissions from transportation. The 2012 Build with Mitigation condition is estimated to be 24,620.8 tpy, which is 573 tpy higher, (or a 2.4 percent increase in CO_2), compared to the No Build condition (24,047.8 tpy). When compared with the 2012 Build Condition estimate of 24,671.8 tpy, the transportation mitigation alternative results in a 51 tpy reduction in CO_2 emissions.

The stationary direct and indirect stationary source greenhouse gas analysis in the SEIR uses the EQUEST model, and demonstrates that the preferred alternative would have a 21.5 percent reduction in CO_2 emissions, when compared with the annual CO_2 emissions for the 2012 code compliant base case estimate of 5,395.1 tpy. The emissions from the 2012 build with mitigation alternative are estimated at 4,235.2 tpy, as shown in Table 5-2.

Construction Period Air Quality

The project proponent has made a commitment to participate in the MassDEP Diesel Retrofit Program to mitigate the construction-period impacts of diesel emissions to the greatest extent practicable.

The MassDEP and DOER appreciate the opportunity to comment on this proposed project. Please contact Jack Zajac (978) 694-3240 for further information on the wastewater issues. If you have further questions on GHG issues, the MassDEP contact is Philip.Weinberg@state.us, (617) 292-5972, and the DOER contact is Meg.Lusardi@state.ma.us, (617) 626-7364. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Meg Lusardi, Gerry Bingham, John Ballam, DOER
Phil Weinberg, Nancy Seidman, John Felix, Christine Kirby, Greg Cooper, MassDEP-Boston
Kevin Brander, Jack Zajac MassDEP-NERO
Marianne Connolly, MWRA
Fran Fink, Town of Reading Conservation Commission

5

Greenhouse Gas Emissions

From the Secretary's Certificate on the ExENF

Greenhouse Gas Emissions

The proposed project is also subject to EEA's Greenhouse Gas (GHG) Policy that requires proponents to quantify project-related GHG emissions and propose and quantify the impact of mitigation measures to reduce GHG emissions. The proponent submitted the results of the GHG analysis with the EENF. In the study, the proponent calculated GHG emissions from both mobile and stationary sources. The GHG emissions analysis evaluated the change in carbon dioxide (CO_2) emissions from project-related traffic and proposed building sources for the 2006 Existing, the 2012 No-Build, the 2012 Build and the 2012 Build with Mitigation Conditions. The EENF used the EQUEST model to compute direct and indirect CO_2 emissions from stationary sources and the U.S. EPA's COMMUTER model Version 2 to estimate changes in CO_2 emissions due to roadway mitigation and traffic demand management measures.

As can be seen in the Table below, under the Build Condition, CO_2 emissions are expected to increase by 2,727.6 tons per year (tpy) from the No-Build Condition. With recommended mitigation measures, CO_2emissions are estimated to be reduced by 151.9 tpy, a 0.6 percent reduction.

GHG Analysis	2006 Existing Condition	2012 No-Build	2012 Build	2012 Build/ No-Build Difference	2012 Build with Mitigation	2012 Build with Mitigation/ Build Difference	%Reduction in GHG Emissions between Build and Build w/ Mitigation
Mobile Sources	19,245.0	24,047.8	24,671.8	624,0	24,626.6	-45.2	0.2%
Direct/Indirect Stationary Sources	0.0	0.0	2,103.6	2,103.6	1,996.9	- 106,7	5.1%
Total	19,245.0	24,047.8	26,775.4	2,727.6	26,623.5	- 151.9	0.6%

(All data expressed in tons per year) Source: ExENF 4b-1.

As mitigation for GHG emissions from mobile sources, the proponent will widen roadways and reconfigure lane usage, upgrade traffic signal hardware, and implement a TDM program. The analysis submitted with the EENF did not quantify the GHG reduction due to proposed TDM measures, nor was it clear which TDM

measures will be implemented in order to achieve the anticipated GHG reductions. In the Single EIR, the proponent should evaluate the impact of TDM measures following guidance in the EEA Policy.
The following mitigation measures were listed in the EENF to help reduce GHG emissions from stationary sources:

- *use highly-reflective (high-albedo) roofing materials;*
- *maximize interior daylighting;*
- *window glazing;*
- *install high-efficiency HVAC systems;*
- *eliminate or reduce use of refrigerants in HVAC systems;*
- *incorporate super insulation;*
- *incorporate motion sensors and lighting and climate control;*
- *use efficient, directed exterior lighting; and*

track energy performance of building and develop a strategy to maintain efficiency.
The EENF also provided a list of possible sustainable building design and systems that may be utilized if they are determined to be practical and feasible. The EENF notes that indoor environmental air quality, water efficiency, and building energy efficiencies will be considered in project design. The proponent will also evaluate and provide sustainable design measures using the Leadership in Energy and Environmental Design (LEED) Green Building Rating System as a general guideline. The proponent should clarify in the Single EIR which of the above-listed measures were evaluated using energy modeling software to determine the 2012 Build conditions.

The Proponent should demonstrate in the Single EIR that it has evaluated and committed to GHG-reduction measures consistent with the MEPA GHG Emissions Policy. The proponent should evaluate additional GHG mitigation alternatives as suggested by MassDEP/DOER in comment submitted on the EENF. The proponent should clarify which specific measures will be implemented, provide supporting modeling data that reflects the implementation of these measures, and clearly depict how these measures reduce GHG emissions in the 2012 Build with Mitigation scenario.

The Single EIR should respond to the comments by MassDEP/DOER with respect to:

- *Pursuit of potential rebates for installation of highly energy efficient equipment from its natural gas provider, National Grid and the Reading Municipal Light Department;*
- *Explanation of building orientation and discussion of expected impacts on energy usage. If the buildings will be oriented to minimize energy usage, corresponding reductions*
- *Additional information on the HVAC system(s), including heating systems of all the building types;*
- *Energy efficient lighting;*
- *Duct insulation, and if incorporated into the project, modeling results of CO2 reductions;*
- *Incorporation of third-party building commissioning;*
- *Implementation of building energy management systems;*
- *Roof and wall insulation;*
- *On-site renewable energy sources. The Single EIR should evaluate the use of photovoltaic (PV) systems in accordance with the recommendations of DOER.*
- *District heating and cooling systems.*

The Single EIR should provide additional justification as to why wind, geothermal and/or biomass energy sources are not feasible for the project site; and

The Single EIR should reflect a commitment to pursue additional GHG mitigation measures in response to the modeling. If the proponent chooses not to model a specific mitigation measure recommended by MassDEP/DOER because it determines the measure to be infeasible for this particular project, the Single EIR must justify why modeling was not conducted. If, after further evaluation of a GHG mitigation measure using energy modeling software, the proponent does not propose to implement the measure, the Single EIR should provide technical and cost analyses to document the rationale for not making the commitment. I strongly encourage the proponent to consult with the MEPA Office, MassDEP and DOER prior to submission of the Single EIR with regard to the anticipated content of the GHG analysis.

The updated GHG analysis should clearly present modeling data inputs, the results of calculations used to quantify Existing Conditions, the Build Condition, and the impact of proposed emissions-reduction mitigation. If the proponent uses bar graphs, graphs should be produced in color so that the reader can understand the results and understand the potential CO_2 reductions associated with discrete mitigation measures. In the Single EIR, the proponent should fully explain any trade-offs inherent in the evaluation of GHG reduction measures, such as increased impacts on some resources to avoid impacts to other resources.

Introduction

The Executive Office of Energy and Environmental Affairs (EEA) has developed a policy that requires project proponents to identify and describe feasible measures that can be implemented to minimize Greenhouse Gas (GHG) emissions. The *MEPA Greenhouse Gas Emissions Policy and Protocol* requires projects undergoing Environmental Impact Review (EIR) review and that meet specific criteria (e.g., generation of 3,000 or more vehicle trips per day) to quantify the Project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying project-related GHG emissions, the Policy also requires proponents to quantify the impact of proposed GHG reduction measures in terms of emissions and energy savings. The goal of the Policy is to identify measures to reduce or minimize GHG emissions. While GHG emissions include several gases, Carbon Dioxide (CO_2) was selected for evaluation because it is the most significant component of project-related GHG emissions. EPA has not set NAAQS for GHGs; however, they do encourage strategies to reduce emissions and save fuel.

The Secretary's Certificate on the Expanded ENF, dated June 27, 2008, required that the Proponent complete the following steps as part of a comprehensive GHG evaluation for the Project:

- Evaluate additional GHG reduction alternatives as suggested by MassDEP/DOER.
- Specify which reduction measures will be implemented.
- Provide supporting modeling data that reflects the implementation of selected mitigation measures.

- Show how selected mitigation measures reduce GHG emissions in the 2012 Build with Mitigation scenario.

The following discussion and analyses address the Secretary's Certificate and the comments received from the reviewing agencies.

Summary of Greenhouse Gas Emissions Quantitative Analysis

In compliance with the MEPA Greenhouse Gas Emissions Policy and Protocol, the air quality analysis included in the Expanded ENF calculated GHG emissions from mobile and stationary sources for the Reading Woods project. The mobile source emissions were calculated by performing an annual GHG emissions mesoscale analysis to evaluate the changes in CO2 emissions for the existing and future conditions within the study area. The year 2012 is the future year of analysis in conformance with standard MEPA policy that the future build design year be five years into the future from the base analysis year, which in this case 2007. The mobile source analysis traffic (volumes, delays, and speeds) and emission factor data were developed for four conditions: (i) 2007 Existing, (ii) 2012 No Build, (iii) 2012 Build, and (iv) 2012 Build with Mitigation.

In addition to mobile sources, direct and indirect CO2 emissions from the Project building sources were calculated using the computer-based EQUEST model.1 Direct emissions include those emissions from the Project itself such as boilers, heaters, and internal combustion engines. Indirect emissions include CO2 emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems.

Total CO2 emissions are determined by combining the CO2 results from the mobile source analysis to the CO2 results from the proposed direct and indirect building source analysis.

Mobile Source CO2 Emissions Results

Please refer to Table 5-1 for a summary of the mobile source CO_2 emissions results. The 2007 Existing Conditions traffic emits 19,245.0 tons per year (tpy) of CO_2. The existing conditions CO_2 emissions are quite large due to the extensive and heavily traveled urban study area and the Project Site's immediate proximity to I-95/Route 128. Under the 2012 No-Build Condition, CO_2 emissions are estimated to increase to 24,047.8 tpy based on increased traffic volumes.

1 EQUEST (the Quick Energy Simulation Tool), version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA

Under the 2012 Build Condition, the CO_2 emissions were estimated to be 24,671.8 tpy (Table 5-1). Under the 2012 Build Condition with Mitigation, the CO_2 emissions were estimated to be 24,620.8 tpy (Table 5-1). This results in a decrease of 51.0 tpy in CO_2 emissions as compared to the 2012 Build Condition. This reduction is due to the geometric and operational improvements of the study area roadways and the TDM program. These emissions also take into account the commitment by the Proponent to help fund the town-proposed Reading Shuttle bus that will link the Project Site to other areas in Reading, including the Reading commuter rail station. This represents an approximately 0.21 percent reduction in the 24,620.8 tpy (2012 Build Condition) The mobile source CO_2 emissions percent reduction is due to the proposed GHG reduction measures and is calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{Reductions Due to Project Mitigation}}{\textit{2012 Build Condition}}$$

The percent reduction in mobile source emissions is calculated as follows:

51.0 tpy/24,671.8 tpy = 0.002067x 100 = 0.21% (see Table 5-1).

The percent reduction for mobile sources is low because the existing traffic along I-95/Route 128 establishes an extremely large base for project-related mobile source reductions to be compared with. In addition, the proposed project's land uses (multi-family housing and senior housing) and suburban location are not conducive to major mobile source reductions.

Stationary Source CO2 Emissions Results

Please refer to Table 5-2 for a summary of the stationary source CO_2 emissions results. Under Existing Conditions, CO_2 emissions from the existing office buildings is calculated to be 1,005.1 tpy. Consistent with minimum building code requirements, under the 2012 Build Condition, the Project is projected to generate 5,395.1 tpy of CO_2 emissions. Under the 2012 Build with Mitigation Condition, Project CO_2 emissions are estimated to be reduced by 1,160.8 tpy for a total CO_2 emission of 4,234.3 tpy. The 1,160.8 tpy represents a 21.5% percent reduction of the 2012 Build Condition, which are directly related to the extensive building and operational GHG reduction measures. The stationary source CO_2 emissions percent reduction is calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{Reductions Due to Project Mitigation}}{\textit{2012 Build Conditions}}$$

The percent reduction in stationary source emissions (direct and indirect) is calculated as follows:

1,160.8 tpy/5,395.1 tpy = 0.215 x 100 = 21.5% (Table 5-2).

GHG Reduction Enhancements

The Proponent is committed to including both structural and operational energy efficient measures into the Project. The following sections provides a discussion of the mitigation measures evaluated in the GHG analysis and the measures to be taken to comply with the goals of the *MEPA Greenhouse Gas Emissions Policy and Protocol.*

Evaluation of MassDEP/DOER Suggested GHG Improvement Alternatives

The Proponent concurs with MassDEP that the early stages of a project are the most opportune times to incorporate sustainable, energy efficient measures into the project. To that end, the Proponent has worked diligently over the last five months to identify and thoroughly evaluate the wide range of energy reduction resources that are available today.

Given the relatively recent focus on GHG impacts in the MEPA review process, the admitted first step by the Proponent has been an educational one concentrating on GHG reduction mitigation as a whole. Through discussion and interaction with The Green Roundtable in Boston, the Proponent was introduced to The Green Engineer LLP, a sustainable design consulting firm recognized for their expertise in LEED, energy modeling and comprehensive evaluation of cost effective, sustainable design measures. As a project consultant, The Green Engineer has been instrumental in helping the Project both identify and evaluate the multitude of design elements, products, and operating practices that are currently available to make projects more energy efficient. The following information provides details on the many GHG reduction measures evaluated as well as an explanation as to why or why not certain measures are appropriate for implementation into the Reading Woods project.

It is important to understand that there are key distinctions among the various uses being proposed as part of this mixed-use project. For purposes of energy efficiency modeling and review of specific energy efficiency measures, the Project is analyzed based on the four (4) Project land uses:

- Multi-Family (202 apartment units)
- Senior Living (142 independent and assisted living units)
- Townhouses (16 units)
- Office (160,000sf)

Due to significant differences in the design, construction and on-going operation of each of these land uses, it is imperative to evaluate the appropriateness and effectiveness of the energy efficiency measures discussed below against each of these four uses. Some energy efficiency measures are appropriate for one land use but not another.

Proposed Stationary Source Project Improvements

The Proponent is committed to incorporating numerous sustainable, energy efficient measures into the Project design. The following stationary source GHG reduction measures were carefully evaluated.

Advanced Buildings Core Performance Guide

The Advanced Buildings Core Performance Guide is nationally recognized as a key resource in designing high performance commercial buildings focused on delivering "best in class" energy efficiency and indoor environmental quality. Using the Core Performance Guide as a basis for comparison, the Proponent evaluated the Reading Woods project against more than 30 criteria focused on optimal performance in building envelope, lighting, HVAC, power systems and controls.

The following sustainable design elements, which are discussed in the same order as presented in the MassDEP comment letter, were evaluated for the Project.

Rebates from Utility Providers

The Proponent met with both National Grid and the Reading Municipal Light Department to discuss natural gas and electricity rebate programs, respectively.

A National Grid representative provided a comprehensive review of the various rebate programs available to natural gas users in their service area. While several rebate programs apply to existing buildings or different use types, the Project will qualify and apply for the following specific gas rebates:

- High Efficiency Gas Heating and Water Heating Rebates for Business and Multifamily Buildings
  - Both the Office and Senior Housing uses will apply for this rebate (Rebates from $500 to $5,000 depending on size and type of equipment).
- High-Efficiency Gas Commercial Kitchen Equipment Rebates
  - The commercial kitchen equipment in the Senior Housing project will apply for this rebate (Up to $1,000 per gas fired steamer or fryer).
- Natural Gas Controls Prescriptive Rebate Application
  - The Multi-Family and Senior Housing projects will apply for a rebate on Energy Star thermostats (Up to $25 per thermostat).

Discussions with the Reading Municipal Light Department revealed that their current rebate programs are focused on:

- **Residential Appliances** – RMLD does provide rebates for the purchase of Energy Star residential appliances. Unfortunately, this rebate program does not apply to multi-family housing developments due to insufficient funds in the rebate program to handle such large-scale developments.
- **Existing Commercial Lighting** – RMLD has a lighting rebate program aimed at encouraging commercial users to change existing T-12 fluorescent fixtures to T-8 or HIDS fixtures to T-5 lamps. Unfortunately, this program does not extend to new commercial projects.

RMLD did however indicate that they are in the process of developing new commercial incentive programs. They also agreed to assign a "key commercial account" manager to the Project as it progresses to identify additional incentive programs that may apply.

Building Orientation and Roofing Materials

Ideal building orientation is widely recognized as maintaining the longest elevation or side of buildings in a southerly orientation and limiting the width of building envelope that faces the east and west. The technical benefit of this orientation is due to the height and angle of the sun at various times of year. In the cooler winter months, the sun rises to a lower angle at its peak intensity, allowing southerly facing building elevations to benefit significantly from solar radiation and heating. In the warmer summer months, the sun is at a much higher angle resulting in much less direct solar exposure on the sides of buildings and more on the roofs of buildings. All the buildings have been oriented on a nearly perfect east/west axis and the southerly exposure is maximized as discussed above.

The technical explanation for the building orientation also helps explain the importance and benefits of using high albedo/reflective roofing materials where practicable. The highest intensity solar radiation occurs in summer months when the sun is highest in the sky. Reflecting this radiation from roofs in warmer summer months greatly reduces heat gain within the building, which translates into significantly lower cooling costs.

The building design and orientation for all buildings at the Project are ideal. The Project will also use high-albedo roofing materials on the flat roofs associated with the multi-family and office components of the Project. The use of lighter colored shingle materials or standing seam metal alternatives for the sloped roofs proposed on the Senior Housing and Townhouse components is also being considered to optimize energy savings for these components of the Project.

High Efficiency HVAC Systems

Because the Proponent will own and be responsible for the daily operation of the HVAC systems in the Senior Housing component of the Project; this use provides the greatest opportunity for energy efficiency gains in the proposed Project. Two energy systems have been evaluated for the Senior Housing component:

1. Cooling Tower with Water Cooled Chiller or Condenser – Cooling tower systems are widely recognized for their energy efficiency superiority over air-cooled systems.
2. Variable Refrigerant Volume (VRV) Air Conditioning System – A VRV system uses sophisticated control technology and inverters to modulate multiple indoor air handlers being served by a single outdoor condenser unit. Larger VRV systems allow individual air handlers to heat or cool as needed, transferring heat from one space to another and resulting in optimal performance. This type of system is especially appropriate for senior housing type uses where residents have widely varying comfort preferences.

The Senior Housing component will commit to using either a cooling tower or a VRV system to substantially improve HVAC system efficiency.

The office component will utilize a Variable Air Volume (VAV) system in place of a standard Constant Air Volume (CAV) system. Different locations within a given building have different heating and cooling needs over the course of a day and more significantly over the course of a year. For example, an office located on the south side of the building (i.e., the side getting the most direct sunlight) will have a higher cooling load than an office on the north side of a building which is primarily shaded throughout the day. A VAV system makes HVAC systems significantly more efficient by regulating the amount of air provided to various areas of the building. VAV boxes are equipped with valves that expand and contract airflow to different areas of a building thereby decreasing the energy requirement of fans directing airflow through the building.

Energy Efficient Lighting

With the exception of the office space, compact fluorescent lighting fixtures will be utilized in all fixed lighting components. In addition to using compact fluorescent sconces in hallways and appropriate common areas, the Project will also provide additional circuitry in hallways and corridors that will automatically turn off specific fixtures during late night or daytime hours. The Proponent has instituted similar common area light reduction programs in other recently completed residential projects. In addition, the Apartment units will be metered separately for all utilities (electricity, gas, and water) and have their own dedicated HVAC unit. Individual metering is well recognized as a highly successful energy saving initiative.

Individually metered tenants closely monitor and adjust their use of utilities because they are paying for exactly what they use.

While the Proponent does not control the build out and finishes that may be selected by a given office tenant, the Proponent does commit to using light/motion sensors in appropriate common areas throughout the Office land use, including "little-used spaces," such as supply storage and utility rooms.

The Proponent commits to using high efficiency metal halide light fixtures for office area exterior lighting. The Proponent also evaluated the use of LED lighting for exterior spaces and found that while bulb replacement frequency is much less for LED lights, the lights are not significantly more energy efficient. Due to higher upfront costs for LED lights, the Proponent has opted to stay with metal halide fixtures.

Duct Insulation

In addition to providing code compliant duct insulation, the Proponent will also introduce a quality control program focused specifically on airtight installation of ductwork.

Third Party Commissioning

- Due to the overall simplicity of building systems in the Apartment, Townhouse and Senior Housing components of this Project, the Proponent and their consultants believe there are minimal operating efficiencies to be gained from third party commissioning. Estimated third party commissioning costs of $0.50-$0.75 per square foot cannot be justified for these uses.
- While the Proponent does not believe that the MA Building Code "requires" building commissioning, the Proponent will commit to having the architect and mechanical/electrical/plumbing engineers for the Office project complete a detailed commissioning of that product type shortly after its opening. This commissioning process will focus on the proper set-up and operation of energy consuming building systems.

Building Energy Management Systems

The Proponent will commit to implementing an Energy Management System for the Office component of the Project under its control (i.e. common areas and corridors). As part of the Sustainability Guidelines discussed at the end of this section, the Proponent will also discuss the merits of programmable HVAC management systems and other energy management systems.

Building management systems are not practicable for the Apartment, Senior Housing and Townhouse uses since these buildings will not contain centrally controlled utility systems.

Roof and Wall Insulation

The Apartment, Senior Housing, and Townhouse land uses will achieve the following roof and wall insulation values:

- Walls up to R-19
- Roofs up to R-30

The Office land use will achieve the following roof and wall insulation values:

- Walls up to R-19
- Roofs up to R-25

Renewable Energy - Photovoltaic

The use of photovoltaic (PV) measures for the Project were seriously considered. However, in consult with specialty energy consultants it was learned that the current energy saving focus should be on building related energy efficiency measures rather than renewable energy sources due the significant capital cost and lengthy payback period of PV systems. That being said, industry insiders also site constant and significant improvements in PV technologies, making PV systems lighter and more efficient. While an extensive PV system may not be feasible for the Project today, it is important to keep it a viable alternative for the future.

This Project Site is especially hampered by the fact that it is served by a municipal light department (Reading Municipal Light Department) which does not contribute to the Commonwealth's Renewable Energy Trust. Because they do not contribute to the Trust, projects in the RMLD service area are not eligible for PV incentives and rebates distributed through the Trust. It is typically these State and local incentives that help make PV systems more economically viable.

To further research the viability of a PV system as part of the Project, the Proponent utilized the "Photovoltaic Calculator" and 'Simple Solar Finance Model" on the Mass Technology Collaborative (MTC) website to take a preliminary look at the payback period for PV system designed to handle up to 500kW of the office building load. Aggressively assuming that the Project would benefit from both State and Federal tax benefits that are available, the Solar Finance Model calculates an initial capital outlay of almost $4,000,000 and a lengthy payback period of 21 years given the absence of up front rebates. These financial constraints make a PV system not a viable alternative at this time.

The Proponent is also open to entering into an economically viable, Energy Management Services Contract similar to the draft template on the MTC website. These third-party, power purchase agreement may however also be negatively impacted by the unavailability of PV rebates or incentives to offset upfront capital costs.

To gain further exposure into the world of photovoltaics, the Proponent is also working with a PV consultant to evaluate a PV system to heat the outdoor pool associated with multi-family project.

Renewable Energy - Wind

Based on review of New England wind resources maps on the Massachusetts Technology Collaborative website that were developed by TrueWind Solutions, LLC, the Project location can only support very low average wind speeds and is therefore not a strong candidate for wind based renewable energy technologies.

District Heating and Cooling

This mitigation measure was determined to be infeasible due to different ownership entities for each land use in the Project. Without knowing if and when future phases (Office and Townhouses) will be built, it is not practical to commit to the upfront capital cost of a district heating and cooling system.

Water Conservation/Wastewater Reduction

The Proponent has taken an "integrated planning" approach to water conservation for the Reading Woods Project with a goal of minimizing the impact on the local water distribution system and the Massachusetts Water Resources Authority (MWRA) water supply system. Maximizing water efficiency within buildings will reduce the burden on the municipal water supply and wastewater systems. Due to significant differences in the design, construction and on-going operation of each of the various land uses, it is imperative to evaluate the appropriateness and effectiveness of the water conservation measures per land use. For example, each rental unit will be equipped with sub-metering of utilities to promote conservation. Like homeowners, when renters know that their dry and wet utilities are individually metered it improves greatly upon their conservation efforts. In addition to these efforts, the following conservation measures will be implemented to reduce Project water demand and in turn, wastewater generation.

Water conservation measures can significantly reduce water usage and wastewater generation Within the 160,000 SF office building, the Proponent will install low flow, high efficiency faucets (0.5 gallons per minute (gpm)) as well as low-flow water closets (1.1 gallons per flush (gpf)), resulting in an estimated 30% reduction in water

use and wastewater discharge based on LEED® guidelines (WE Credit 3.2). This 30% reduction in water usage and wastewater generation equates to a reduction of 3,600 gallons per day (gpd) and 1,314,000 gallons per year (gpy) from the office land use. This 3,600 gpd savings equates to 0.94 tons/year of CO_2 emissions savings (details are presented in the Attachment C). This 0.94 tons/yr reduction is included in the total stationary source CO_2 emissions results (Table 5.-2).

As part of further site investigations since filing of the Ex ENF, the Proponent identified an existing irrigation well on site that appears to be in good condition. Combining the use of this well with the Proponent's previous commitment to use drought resistant plants throughout the Project, there will be no need to use a treated water source as irrigation water as was previously assumed. This will result in a projected water demand essentially equal to the projected wastewater generation of 71,530gpd. This water demand reduction of 7,150gpd or 2,610,000 gallons per year equates to an energy savings of over 780 kWh per year for the Project.

Tenant Sustainability Guidelines

As a firm, the Proponent is committed to implementing sustainable design measures into all of its development projects. One challenge in doing this is that the Proponent will not control many aspects of the interior fit-out of the Office space. However, in an effort to make tenants aware of the social and economical benefits of various sustainable design technologies available today, the Proponent is preparing a detailed binder of Tenant Sustainability Guidelines. The goal of these Guidelines is to create a recognition and working knowledge of the many sustainable products and practices available today. Specific product cut sheets and a summary of environmental and cost benefits of the products are included in the Guidelines.

Proposed Mobile Source Project Improvements

In addition to stationary source mitigation measures, the Proponent is committed to implementing a variety of mobile source GHG reduction measures as well. These Transportation Demand Management (TDM) strategies as well as improvements to site access are described in Chapter 3 - *Traffic and Transportation.*

Traffic Mitigation Summary

- Widen the South Street eastbound and westbound approaches to two lanes. This improvement will allow the two approaches to have an exclusive left turn lane and a shared through/right turn lane in each direction, thereby improving the capacity for both approaches.

- Upgrade the traffic signal hardware at the intersection of Main Street/South Street; improve safety and reduce driver confusion during the lead signal phase for the northbound direction by providing left turn arrow designation.
- If desired by the Town of Reading, reconfigure the intersection of South Street/ Jacob Way to promote Jacob Way as the primary route to the site, and treat South Street as a minor street under stop sign control, to help promote reduced usage of that street by cut-through traffic.

In addition to physical capacity improvements, the Proponent will encourage its office tenants and residential management team to implement a number of travel demand management (TDM) measures, outlined later in this chapter, which will contribute to a reduction in vehicular traffic to and from the site.

The Proponent is committed to the design and implementation of these improvements, which will be constructed concurrent with the construction of the Project. These improvements are dependent on the ability to obtain all local and State permits to construct the Project.

Transportation Demand Management Summary

The goal of the travel demand management (TDM) plan is to reduce the Project's overall traffic impact through the implementation of measures that are aimed at affecting the demand side of the transportation equation, rather than the supply side. Please refer to Chapter 3 – Traffic and Transportation for more detailed TDM information.

Commitment to Provide Shuttle Bus

The Town of Reading is in the process of establishing a town-wide shuttle bus service that will provide service to town residents and employees. The service will link neighborhoods with high demand uses such as the Reading MBTA Commuter Rail station, the Public Library, Reading Memorial High School, the Senior Center, and the Walkers Brook Drive retail area. The service has already received approval from the Metropolitan Planning Organization (MPO) and is awaiting approval from the Executive Office of Transportation (EOT).

As currently proposed, the southern terminus of the shuttle is at the intersection of Route 28/Summer Avenue, and does not extend southerly, to the Project Site. Based on discussions between the Proponent and the Reading Town Manager since the filing of the ExENF, the Town of Reading has preliminarily agreed to revise the proposed routes and extend one of the routes (likely *Route 1-Fixed Route* depicted in the material included in the Appendix to this report) to the Project Site at the

completion of Phase 1. In return, the Proponent has agreed to help partially fund the shuttle service after opening Phase 1 of the development. This partial funding will help to replace some of the federal and state funding for the shuttle service, which is expected to end after a period of three years.

Updated Greenhouse Gas Emissions Analysis

The Secretary's Certificate on the Expanded ENF required that the Proponent respond to suggested GHG mitigation alternatives from DEP and DOER and clarify the GHG emission calculations. The following sections provide updated GHG emissions analysis and responses to GHG-related comments.

Mobile Source Methodology

The GHG mobile source analysis is conducted following procedures similar to the ozone mesoscale analysis (presented in the Expanded ENF). The mobile source analysis estimated the area wide CO_2 emissions from vehicle traffic for a period of one year. The change in CO_2 emissions from traffic is based on the average yearly traffic volumes, roadway lengths and vehicle emissions factors for existing and new trips for weekday and weekend conditions. The GHG analysis also calculated the changes in CO_2 emissions due to the proposed roadway improvements and TDM measures, including the proposed Reading shuttle bus. This computation uses EPA's COMMUTER[2] model Version 2. Mobile source GHG emissions are based on traffic volumes, the distance traveled and the GHG emission rate (in grams per vehicle mile traveled). The COMMUTER model evaluates the study area and the Project to identify measures that would reduce or eliminate vehicle trips and, therefore, GHG emissions.

Mobile Source Emission Rates

MOBILE6.2 utilizes an estimate of CO_2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection and maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect on the results. The emission rates calculated in this air quality study are however, generally adjusted to reflect Massachusetts' specific conditions.

2 COMMUTER, version 2.0 release from EPA (U.S. Environmental Protection Agency)

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mobile source analysis for CO_2 emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The detailed traffic analysis is presented in Chapter 3, *Traffic and Transportation*.

Stationary Source Methodology

The stationary source analysis calculated Project-related CO_2 emissions from building sources (electricity and/or fossil fuels) using the computer-based EQUEST model. These building sources included boilers, heaters and internal combustion engines. Because the Project is in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. To estimate GHG-related impacts, the stationary source analysis compares GHG emissions for two build conditions: (i) 2012 Build; and (ii) 2012 Build with Mitigation. The 2012 Build Condition represents the stationary source emissions that would result if the Project were to be built using typical construction materials and electrical and heating/cooling equipment as prescribed by the Massachusetts Building Code[3]. The 2012 Build with Mitigation Condition represents the Project-related emissions resulting from the use of improved building materials, electrical systems and/or heating/cooling equipment.

Existing CO_2 Emissions

The calculation of 2007 Existing Condition emissions provides a base for which future years can be evaluated.

Existing Mobile Source CO_2 Emissions

The mobile source analysis calculated the 2007 Existing Condition CO_2 emissions from the major roadways in the study area. These emissions, estimated to be 19,245.0 tons/year, establish a baseline to which future emissions can be compared. Due to the comprehensive study area determined for this project for the mobile source analysis (as discussed below in the Mobile Source section), the CO_2 emissions under Existing Conditions represents a relatively large number. Table 5-1 below presents the existing CO_2 analysis results for the 2007 Existing Conditions.

3 Massachusetts Building Code 780 CMR, 6th Edition (2006).

Existing Stationary Source CO_2 Emissions

The GHG analysis calculated the 2007 Existing Condition CO_2 emissions for direct and indirect emissions from existing stationary sources. Under the Existing Condition, the CO_2 emissions are calculated to be 1,005.1 tpy. This is the baseline from future estimated emission data are compared (Table 5-2).

Future CO_2 Emissions

Future Project-related emission calculations are based upon changes in traffic and emission factor data as well as building sources. The traffic data include traffic volumes, vehicle miles, roadway operations, and physical roadway Mitigation. The emission factor data include emission reduction programs, years of analysis, and roadway speeds. The Project's building sources included direct emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following section summarizes the findings of the mobile source and stationary source (direct and indirect) analyses for the Project.

Future Mobile Source CO_2 Emissions

The mobile source analysis estimated the future study area CO_2 emissions due to the changes in traffic and emission data. Under the 2012 No-Build Condition, CO_2 emissions were estimated to be 24,047.8 tpy (Table 5-1). The 2012 No-Build Condition CO_2 emissions are greater than the 2007 Existing Condition CO_2 emissions (19,245.0 tpy) due to projected increases in traffic volumes in 2012 as compared to the existing traffic volumes due to growth within the study area (without the Project).

Under the 2012 Build Condition, the CO_2 emissions were estimated to be 24,671.8 tpy (Table 5-1). Under the 2012 Build Condition with Mitigation, the CO_2 emissions were estimated to be 24,620.8 tpy (Table 5-1). This results in a decrease of 51.0 tpy in CO_2 emissions as compared to the 2012 Build Condition. This reduction is due to the geometric and operational improvements to area roadways and the TDM program. These emissions also take into account the commitment by the Proponent to help fund the town-proposed Reading Shuttle bus that will link the project site to other areas in Reading, including the Reading commuter rail station. This represents an approximately 0.21 percent reduction in of the 24,620.8 tpy (2012 Build Condition) The mobile source CO_2 emissions percent reduction is due to the proposed GHG reduction mitigation and is calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{Reductions Due to Project Mitigation}}{\textit{2012 Build Condition}}$$

The percent reduction in mobile source emissions is calculated as follows:

51.0 tpy / 24,671.8 tpy = 0.002067 x 100 = 0.21% (Table 5-1).

The percent reduction for mobile sources is low because of the existing traffic along I-95/Route 128 establishes an extremely large base for which project-related mobile source reductions to be compared with. Specific details of these proposed Mitigation are discussed below in the 'Mobile Source-Related Mitigation' section below. Table 5-1 below presents CO_2 emissions from mobile sources under all conditions.

Table 5-1 Mobile Source CO_2 Analysis Results (tpy)

2007 Existing Condition	2012 No-Build Condition	2012 Build Condition	2012 Project Emissions	2012 Reductions Due to Project Mitigation	2012 Build w/Mitigation Condition[1]	Percent Reduction of Project Mitigation to Project Emissions
19,245.0	24,047.8	24,671.8	624.0	51.0	24,620.8	-0.21%

Note: 1 The proposed Mitigation are described in 'Proposed Project Mitigation' section below. Mobile source Mitigation include roadway/traffic Mitigation and TDM measures including the proposed Reading Shuttle bus which will link the project site to other areas in Reading, including the Reading commuter rail station.

Future Stationary Source CO_2 Emissions

The Project will generate GHG emissions through the use of electricity and fossil fuels. The air quality analysis calculated the direct and indirect stationary source CO_2 emissions for the 2012 No-Build, the 2012 Build, and 2012 Build with Mitigation conditions. Direct emissions include those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions includes those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems.

The stationary source analysis included the following GHG mitigation measures:

- Building Orientation and Roofing Materials
- High Efficiency HVAC Systems
- Energy Efficient Lighting
- Roof and Wall Insulation
- Water Conservation/Wastewater Reduction

The following is a list of additional GHG mitigation measures, which were not able to be modeled, but are expected to result in additional GHG emission reductions:

- Advanced Buildings Core Performance Guide
- Rebates from Utility Providers
- Duct Insulation
- Commissioning Process
- Energy Management System
- Tenant Sustainability Guidelines

Under the 2012 Build Condition, the stationary source CO_2 emissions were estimated to be 5,395.1 tpy (Table 5-2). Under the 2012 Build Condition with Mitigation, the CO_2 emissions were estimated to be 4,234.3 tpy. This results in a decrease of 1,160.8 tpy in CO_2 emissions as compared to the 2012 Build Condition. This reduction in stationary source emissions is due to the extensive proposed building and operational Mitigation discussed in the 'Proposed Project Mitigation' section above. These Mitigation results in represents an approximately 22 percent reduction of the 5,395.1 tpy 2012 Build Condition.

The percent reduction in stationary source CO_2 emissions is calculated as follows:

$$\textit{Reduction \%} = \frac{\textit{Reductions Due to Project Mitigation}}{\textit{2012 Build Condition}}$$

Therefore, the percent reduction in stationary source emissions due to Project Mitigation equation is 1,160.8 tpy /5,395.1 tpy = 0.215 X 100 = 21.5% (Table 5-2).

Reductions are due to the proposed building Mitigation discussed in the 'Proposed Project Mitigation' section below.

Table 5-2 below presents CO_2 emissions from direct and indirect stationary sources under all conditions.

Table 5-2 Stationary Source CO_2 Analysis Results (tpy)

2007 Existing Condition	2012 No-Build Condition	2012 Build Condition[1]	2012 Project Emissions[2]	2012 Reductions Due to Project Mitigation	2012 Build w/ Mitigation Condition[3]	Percent Reduction of Project Mitigation to Project Emissions
1,005.1	1,005.1	5,395.1	4,390.0	-1,160.8	4,234.3	21.5%

Notes:
1 The 2012 Build Condition is assumed to meet the minimum requirements of the MA Building Code.
2 These emission represent the 2012 Build Condition emission minus the existing buildings (2012 No-Build Condition) and are presented for informational purposes.
3 The proposed Mitigation are described in 'Proposed Project Mitigation' section above. Mitigation include building design efficiencies. The emissions also account for 0.94 tons/year in savings for building water conservation (calculations are presented in the Attachment C.)

The Proponent has developed additional GHG mitigation measures that have resulted in a substantial reduction in GHG emissions as compared to the Expanded ENF. The updated GHG analysis calculated a 22% reduction in stationary source GHG emissions due these additional GHG mitigation measures, as compared to 5% reduction calculated in the Expanded ENF. All of the GHG emissions presented in the updated GHG analysis are substantially higher that the values presented in the Expanded ENF. These values are higher because the methodology used in the updated GHG analysis was improved to more accurately calculate the different land use categories and to calculate the MA Building Code compliant conditions. While these modeling improvements resulted in higher GHG emissions for all conditions, they also provided for the ability to more accurately estimate the benefits of the GHG mitigation measures.

Conclusion

The project Proponent is committed to implementing reasonable mitigation measures to reduce the proposed Project's GHG emissions. Extensive efforts were undertaken to identify cost effective GHG reduction measures. This effort included consulting with a sustainable design consulting firm, a LEED certified expert, project architects, mechanical engineers, environmental engineers, and a solar design engineer to assist in the energy modeling and comprehensive evaluation of cost effective, sustainable design GHG mitigation measures. As a result, the GHG emission reduction for the 2012 Build with Mitigation changed from 106.7 tpy (5% reduction) in the Expanded ENF to 1,160.8 tpy (22% reduction) in the Single EIR. This reduction is due to the additional GHG reduction mitigation measures.

The air quality study demonstrates that the Project (Reading Woods) complies with the Executive Office of Energy and Environmental Affairs (EEA) policy on Greenhouse Gas emissions. The GHG emissions analysis demonstrates that the Project meets the EEA policy on GHG emissions because it includes mobile and stationary source mitigation measures that will reduce the GHG emissions from levels expected from a project without mitigation.

CO2 Conversion Factors

Electricity **1107** lb CO2/Mwh ISO-New Elgnad Marginal Emissions Report
Gas **117.08** lb CO2/Mbtu The Energy Information Administration Documentation for Emiss 136 lb CO2/Mbtu

Coverage	City	Analysis Year	Building Location
MA	Middleton	2007	Reading MA

	File Name	Building Type	Building Area	No. of Building	Total Elec. (Mwh)	CO2 from electricity (lbs)	CO2 from electricity s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	CO2 from gas s (tons)	TOTAL CO2 (tons)
Existing 2007	Addison_Office_Existing	Office	208,000	1	1,673.70	1,852,785.90	926.39	1,343.70	157,320.40	78.66	**1005.05**
											0.00
											0.00
											1005.05

CO2 Conversion Factors

Electricity **1107** lb CO2/Mwh ISO-New Englad Marginal Emissions Report
Gas **117.08** lb CO2/Mbtu The Energy Information Administration Documentation for Emiss 136 lb CO2/Mbtu

Coverage	City	Analysis Year	Building Location
MA	Middleton	2012	Reading MA

	File Name	Building	Building Type	Building Area	No. of Building
Code Compliant	Reading_2012Build_Office_cc	Office	Office	136,000	1
	Reading_2012Build_Apartments_cc_n	Multi-family	Multi-family	126,000	1
2012	Reading_2012Build_Apartments_cc_s	Multi-family	Multi-family	160,000	1
	Reading_2012Build_SeniorLiving_cc	Health	Health	165,000	1
	Reading_2012Build_Townhouses_cc	Multi-family	Multi-family		
				587,000	

Total Elec. (Mwh)	CO2 from electricity (lbs)	s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	s (tons)	TOTAL CO2 (tons)
1,584.90	1,754,484.30	877.24	295.00	34,538.60	17.27	**894.51**
1,511.70	1,673,451.90	836.73	0.00	0.00	0.00	**836.73**
1,511.70	1,673,451.90	836.73	0.00	0.00	0.00	**836.73**
5,090.90	5,635,626.30	2,817.81	0.00	0.00	0.00	**2,817.81**
9.70	10,737.90	5.37	68.10	7,973.15	3.99	**9.36**
						5,395.13

	File Name	Building	Building Type	Building Area	No. of Building
Build Conditions w.	Reading_2012BuildMit_Office	Office	Office	136,000	1
Improvements	Reading_2012BuilMit_Apartments_n	Multi-family	Multi-family	126,000	1
2012	Reading_2012BuildMit_Apartments_s	Multi-family	Multi-family	160,000	1
	Reading_2012BulldMit_SenlorLiving	Health	Health	165,000	1
	Reading_2012BuildMit_Townhouses	Multi-family	Multi-family	24,000	
				587,000	

Total Elec. (Mwh)	CO2 from electricity (lbs)	s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	s (tons)	TOTAL CO2 (tons)
1,176.00	1,301,832.00	650.92	1,211.90	141,889.25	70.94	**721.86**
953.30	1,055,303.10	527.65	2,253.20	263,804.66	131.90	**659.55**
953.10	1,055,081.70	527.54	2,253.20	263,804.66	131.90	**659.44**
2,916.60	3,228,676.20	1,614.34	9,753.30	1,141,916.36	570.96	**2,185.30**
9.40	10,405.80	5.20	65.80	7,703.88	3.85	**9.05**
						4,235.21

Total CO2 Emission Results (Stationary Source)

Existing Conditions (2006)			Build Conditions (2011)		Net Increase from No Build to Build
CO2 from Building/Energy			CO2 from Building/Energy		CO2 from Stationary Source
Office	**1005.05**	tons	Office	894.5 tons	**4390.1** tons
			Multi-family	836.7 tons	
			Multi-family	836.7 tons	
			Health	2817.8 tons	
			Multi-family	9.4 tons	
				tons	
				tons	
				tons	
				tons	
				tons	
sum	**1,005.1**	tons	**sum**	**5395.1 tons**	

			Improved Build Conditions (2011)		Net Increase from No Build to Improved Build
			CO2 from Building/Energy		CO2 from Stationary Source
			Office	721.9 tons	**3230.2**
			Multi-family	659.6 tons	
			Multi-family	659.4 tons	
			Health	2185.3 tons	
			Multi-family	9.1 tons	
				tons	
				tons	
				tons	
				tons	
				tons	
			sum	**4235.2** tons	

eQuest Results

eQUEST Results by Direction

	2012 Code Compliant Condition					2012 Build with Mitigation					
	Electric (Mwh)	Gas (Mbtu)	Electric (tons)	Gas (tons)	Total CO2	Electric (Mwh)	Gas (Mbtu)	Electric (tons)	Gas (tons)	Total CO2	Δ
North	1,565.2	295.0	866.3	17.3	**883.6**	1,179.2	1,207.0	652.7	70.7	723.3	171.2
West	1,605.0	294.9	888.4	17.3	**905.6**	1,176.5	1,062.9	651.2	62.2	713.4	181.1
South	1,564.7	295.0	866.1	17.3	**883.3**	1,171.9	1,514.6	648.6	88.7	737.3	157.2
East	1,604.8	294.9	888.3	17.3	**905.5**	1,176.4	1,063.1	651.1	62.2	713.4	181.2
Average	***1,584.9***	***295.0***			**894.5**	***1,176.0***	***1,211.9***	***650.9***	***70.9***	***721.9***	

	2012 Code Compliant Condition					2012 Build with Mitigation					
	Electric (Mwh)	Gas (Mbtu)	Electric (tons)	Gas (tons)	Total CO2	Electric (Mwh)	Gas (Mbtu)	Electric (tons)	Gas (tons)	Total CO2	Δ
North	1,511.7		836.7		**836.7**	***953.3***	***2,253.2***	***527.7***	***131.9***	***659.6***	***177.1***
South	1,511.7		836.7		**836.7**	***953.1***	***2,253.2***	***527.5***	***131.9***	***659.4***	***177.3***
Average	***1,511.7***		***836.7***		**836.7**						

	2012 Code Compliant Condition					2012 Build with Mitigation					
	Electric (Mwh)	Gas (Mbtu)	Electric (tons)	Gas (tons)	Total CO2	Electric (Mwh)	Gas (Mbtu)	Electric (tons)	Gas (tons)	Total CO2	Δ
North	5,109.3		2,828.0		**2,828.0**	2,916.6	9,753.3	1,614.3	571.0	2,185.3	632.5
West	5,072.4		2,807.6		**2,807.6**	2,851.4	9,752.8	1,578.2	570.9	2,149.2	668.6
South	5,109.4		2,828.1		**2,828.1**	***2,916.6***	***9,753.3***	***1,614.3***	***571.0***	***2,185.3***	632.5
East	5,072.3		2,807.5		**2,807.5**	2,851.4	9,752.8	1,578.2	570.9	2,149.2	668.6
Average	5,090.9		2,817.8		**2,817.8**						

	2012 Code Compliant Condition							2012 Build with Mitigation							
	Electric (Mwh)	Gas (Mbtu)	Electric (tons)	Gas (tons)	Number of units	Total CO2 per unit	Total CO2	Electric (Mwh)	Gas (Mbtu)	Electric (tons)	Gas (tons)	Number of units	Total CO2 per unit	Total CO2	Δ
North	9.7	67.6	5.4	4.0	**16.0**	**9.3**	**149.0**	9.4	65.8	5.2	3.9	16.0	9.1	144.9	5.0
West	9.8	68.7	5.4	4.0	**16.0**	**9.4**	**150.8**	9.5	67.1	5.2	3.9	16.0	9.2	146.8	3.1
South	9.7	67.6	5.4	4.0	**16.0**	**9.3**	**148.9**	***9.4***	***65.8***	***5.2***	***3.9***	***16.0***	***9.1***	***144.8***	***5.0***
East	9.8	68.6	5.4	4.0	**16.0**	**9.4**	**150.7**	9.5	67.0	5.2	3.9	16.0	9.2	146.7	3.2
Average	**9.7**	**68.1**	**5.4**	**4.0**		**9.4**	**149.8**								

- The average of all directions for the office building is used for calculations for the 2012 Build with Mitigation condition
- The results for north and south facing for Apartments are used for calculations for the 2012 Build with Mitigation condition.
- The results for south facing for Senior Housing and Townhouses are used for calculations for the 2012 Build with Mitigation Condition.

- The following is an example of the eQUEST outputs for 2012 Code Compliant Condition. It represents the output for north direction only.

Conversion

Conversion Factors

Multiply	By	To Obtain	
Mwh	1107	lbs	**(For Electricity)**
Mbtu	117.08	lbs	**(For Gas)**
lbs	0.0005	tons	

Greenhouse Gas Reduction – Wastewater Conservation

Greenhouse Gas Reductions due to Office Building Water Conservation

Office Building 100% Wastewater Rate (gallons/day)	Water Conservation Reduction Factor	Projected Wastewater Rate
12,000	30%	8,400

Greenhouse Gas Emission Equation:

Gallons/day x 365 days/year x 1 kgal/1000 gal x 1.3 kWh/kgal* x 1 mWh/1000 kWh x 1107 GHG lbs./mWh x 0.0005 tons/lb= GHG tons/year

Sample Calculation:

8,400 gallons/day x 365 days/year x 1 kgallon/1000 gallons x 1.3 kWh/kgallon x 1 mWh/1000 kWh x1107 GHG lbs./mWh x 0.0005 tons/lb = 2.21 GHG tons/year

100% Wastewater Rate

Wastewater Rate (gallons/day)	Annual Wastewater Rate (gallons/year)	Annual Wastewater Flow Energy Usage (Kilowatt Hours/year)	Greenhouse Gas Emissions from Wastewater Rate (tons/year)
12,000.0	4,380,000.0	5,694.0	3.15

Reduced Wastewater Rate

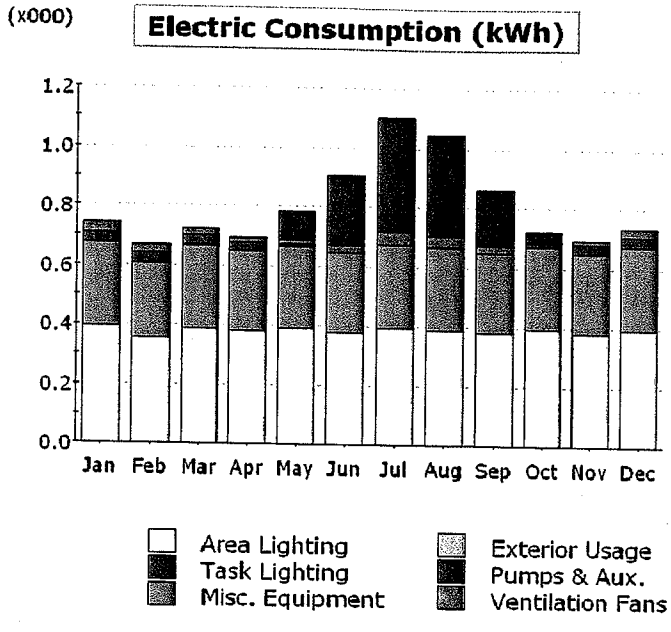
Wastewater Rate (gallons/day)	Annual Wastewater Rate (gallons/year)	Annual Wastewater Flow Energy Usage (Kilowatt Hours/year)	Greenhouse Gas Emissions from Wastewater Rate (tons/year)
8,400.0	3,066,000.0	3,985.8	2.21

Change in Greenhouse Gas Emissions

100% Wastewater Rate Greenhouse Gas Emissions	Reduced Wastewater Rate Greenhouse Gas Emissions	Change in Greenhouse Gas Emissions
3.15 tons/yr	2.21 tons/yr	0.94 tons/yr

*Average energy cost for wastewater treatment as estimated by the Massachusetts Water Resources Authority.

(x000)



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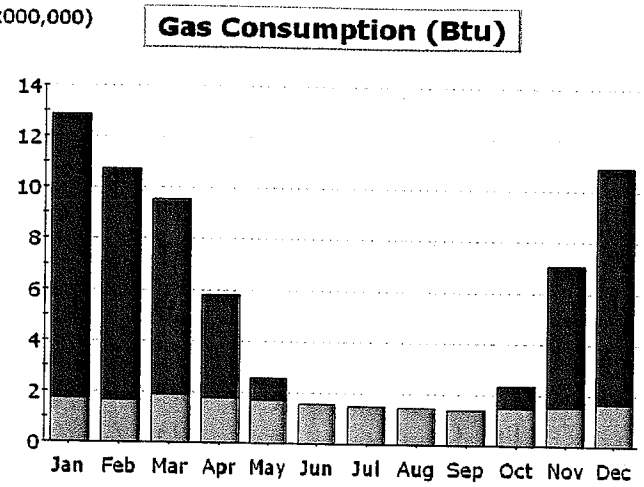


Electric Consumption (kWh x000)

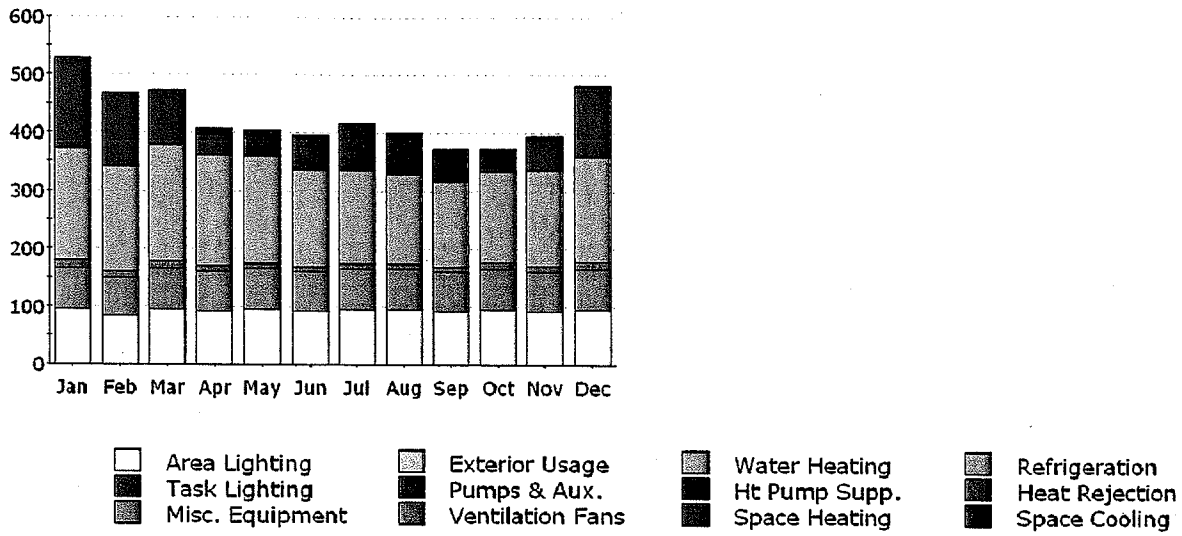
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.00	0.00	0.10	0.23	0.39	0.34	0.19	0.04	-	-	1.28
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.03	0.03	0.02	0.01	0.01	0.03	0.04	0.04	0.02	0.01	0.02	0.03	0.29
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.22
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.28	0.25	0.28	0.27	0.28	0.27	0.28	0.28	0.27	0.28	0.27	0.28	3.27
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.39	0.35	0.39	0.38	0.39	0.38	0.39	0.39	0.38	0.39	0.38	0.39	4.61
Total	0.74	0.67	0.72	0.69	0.78	0.90	1.10	1.04	0.86	0.72	0.69	0.73	9.67

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	11.09	9.05	7.66	4.00	0.83	0.01	-	-	-	0.86	5.56	9.20	48.25
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.77	1.68	1.89	1.78	1.72	1.56	1.48	1.44	1.38	1.47	1.52	1.69	19.36
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	12.86	10.73	9.55	5.78	2.55	1.57	1.48	1.44	1.38	2.32	7.08	10.88	67.61

(x000)

Electric Consumption (kWh)

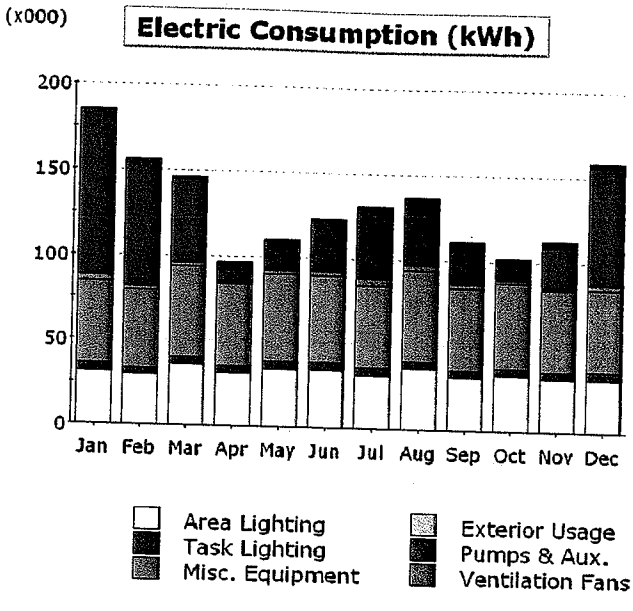


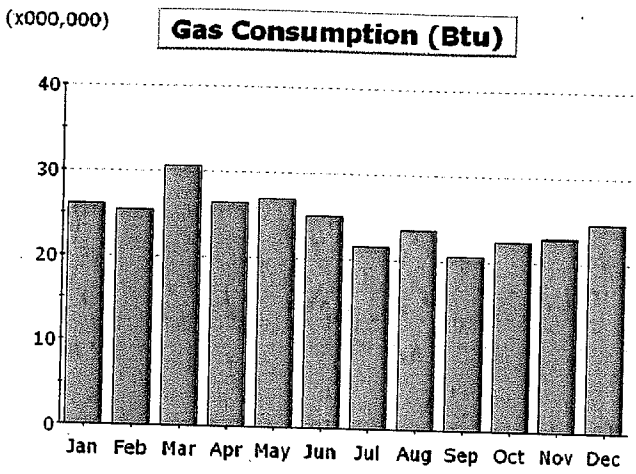
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	2.2	11.5	41.1	60.8	81.3	73.1	54.7	30.4	7.3	2.1	364.6
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	156.6	126.0	92.6	34.3	3.9	-	-	-	0.1	7.1	51.8	118.6	591.1
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	193.7	180.9	200.7	190.9	184.4	166.2	160.8	153.9	148.4	159.0	164.4	182.3	2,085.6
Vent. Fans	12.5	11.0	11.7	9.9	8.5	7.8	8.3	8.2	7.8	8.9	10.4	11.8	116.6
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	71.8	64.9	71.8	69.5	71.8	69.5	71.8	71.8	69.5	71.8	69.5	71.8	845.6
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	93.9	84.8	93.9	90.9	93.9	90.9	93.9	93.9	90.9	93.9	90.9	93.9	1,105.8
Total	528.5	467.6	473.0	407.0	403.7	395.2	416.1	400.9	371.4	371.0	394.3	480.5	5,109.3

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													





Electric Consumption (kWh x000)

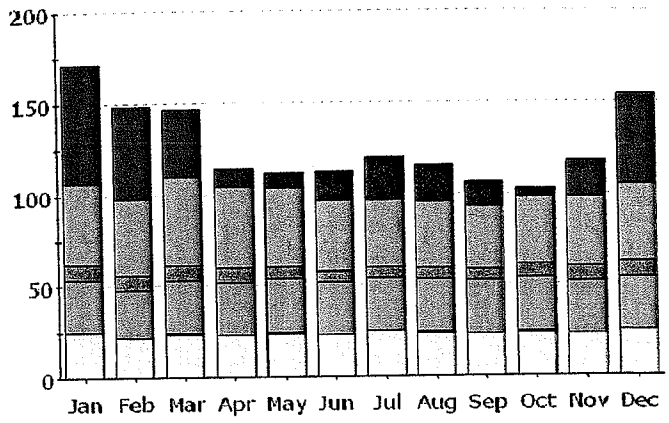
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.4	-	1.7	4.8	17.1	29.9	42.0	39.2	25.3	11.9	4.0	1.8	178.2
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	96.7	74.6	48.2	6.9	0.6	-	-	-	0.0	0.9	22.9	69.0	319.9
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	3.3	2.6	2.3	1.2	1.9	3.0	4.1	3.6	2.3	1.4	1.5	2.8	30.1
Pumps & Aux.	0.1	0.1	0.1	0.1	0.0	-	-	-	0.0	0.0	0.1	0.1	0.7
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	48.8	45.3	52.7	48.0	51.4	50.6	48.8	52.7	48.0	50.1	48.0	48.8	593.1
Task Lights	4.1	3.9	4.8	4.1	4.6	4.6	4.1	4.8	4.1	4.4	4.1	4.1	51.8
Area Lights	31.5	29.8	35.8	31.4	34.3	34.3	31.5	35.8	31.4	32.9	31.4	31.5	391.5
Total	184.9	156.3	145.6	96.6	110.0	122.4	130.5	136.0	111.2	101.6	112.0	158.1	1,565.2

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	25.97	25.38	30.59	26.31	26.91	24.99	21.46	23.43	20.47	22.30	22.76	24.46	295.03
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	25.97	25.38	30.59	26.31	26.91	24.99	21.46	23.43	20.47	22.30	22.76	24.46	295.03

(x000)

Electric Consumption (kWh)



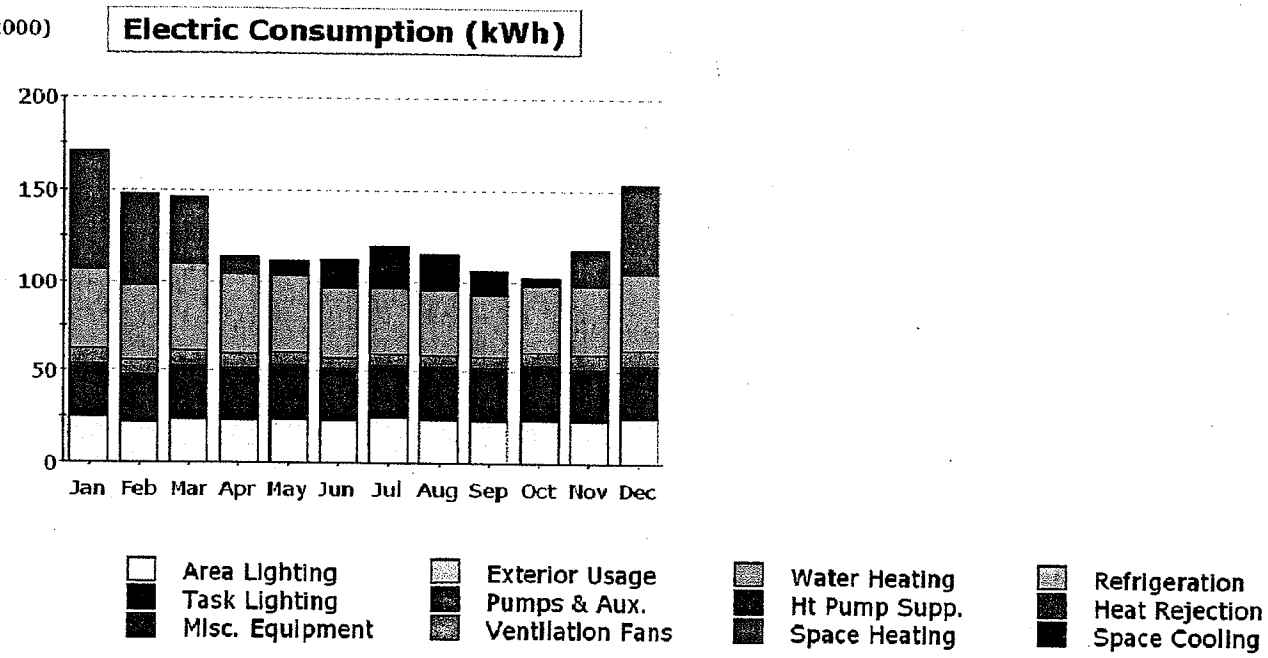
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.1	0.4	7.5	15.2	22.5	19.7	13.1	3.8	0.0	-	82.3
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	64.1	49.9	36.9	9.4	0.3	-	-	-	-	0.3	19.9	48.9	229.8
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	44.0	41.8	47.1	44.3	42.8	38.8	36.8	36.0	34.3	36.5	37.8	41.9	482.1
Vent. Fans	8.8	7.8	8.4	7.8	7.1	6.2	5.8	5.9	6.3	7.5	7.8	8.5	87.9
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	29.1	26.3	29.1	28.2	29.1	28.2	29.1	29.1	28.2	29.1	28.2	29.1	342.9
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	24.5	22.0	24.1	23.6	24.2	23.4	24.5	24.1	23.7	24.4	23.6	24.5	286.6
Total	170.6	147.9	145.7	113.7	111.1	111.7	118.8	114.7	105.5	101.5	117.4	153.0	1,511.7

Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

(x000)



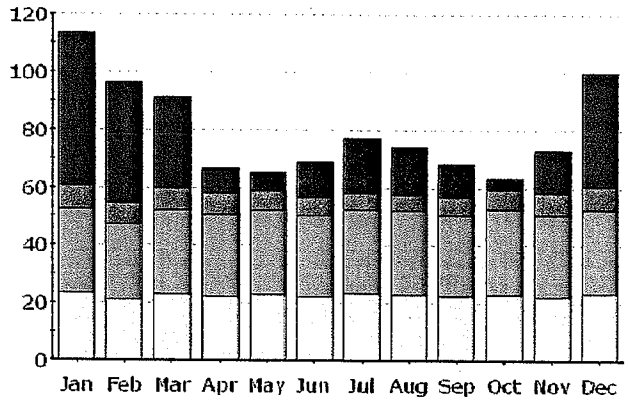
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.1	0.4	7.5	15.2	22.5	19.7	13.1	3.8	0.0	-	82.3
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	64.1	49.9	36.9	9.4	0.3	-	-	-	-	0.3	19.9	48.9	229.8
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	44.0	41.8	47.1	44.3	42.8	38.8	36.8	36.0	34.3	36.5	37.8	41.9	482.1
Vent. Fans	8.8	7.8	8.4	7.8	7.1	6.2	5.8	5.9	6.3	7.5	7.8	8.5	87.9
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	29.1	26.3	29.1	28.2	29.1	28.2	29.1	29.1	28.2	29.1	28.2	29.1	342.9
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	24.5	22.0	24.1	23.6	24.2	23.4	24.5	24.1	23.7	24.4	23.6	24.5	286.6
Total	170.6	147.9	145.7	113.7	111.1	111.7	118.8	114.7	105.5	101.5	117.4	153.0	1,511.7

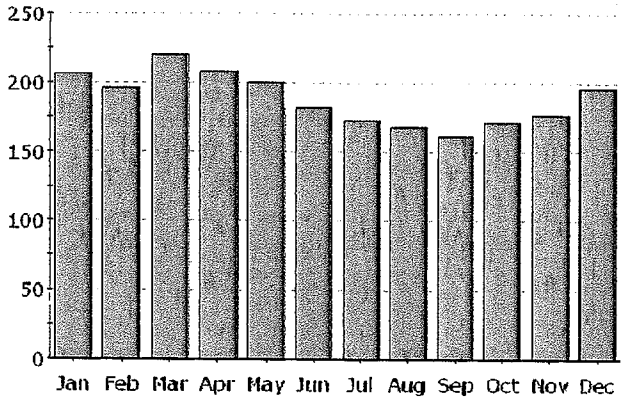
Gas Consumption (Btu)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool													
Heat Reject.													
Refrigeration													
Space Heat													
HP Supp.													
Hot Water													
Vent. Fans													
Pumps & Aux.													
Ext. Usage													
Misc. Equip.													
Task Lights													
Area Lights													
Total													

(x000) **Electric Consumption (kWh)**



(x000,000) **Gas Consumption (Btu)**



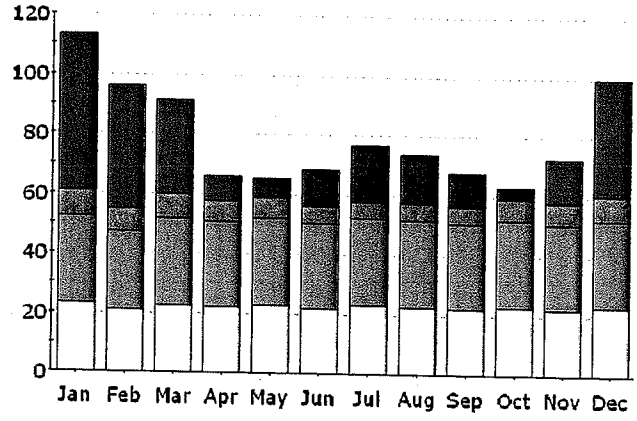
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.02	0.22	6.09	12.46	18.78	16.52	11.32	3.67	0.05	0.01	69.14
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	52.33	41.59	31.35	7.97	0.32	-	-	-	-	0.05	14.39	39.15	187.16
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	8.49	7.55	8.06	7.43	6.80	5.86	5.45	5.57	6.02	7.14	7.53	8.19	84.09
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	29.15	26.31	29.10	28.19	29.11	28.17	29.14	29.10	28.20	29.13	28.20	29.15	342.94
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	23.11	20.74	22.68	22.26	22.82	22.00	23.09	22.68	22.29	22.97	22.27	23.11	270.02
Total	113.08	96.18	91.20	66.07	65.14	68.49	76.47	73.87	67.82	62.96	72.44	99.60	953.34

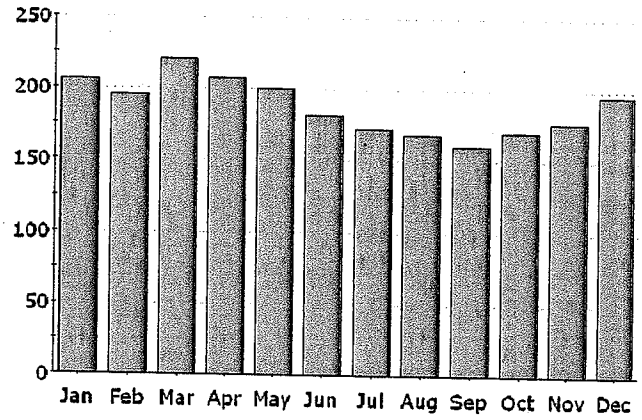
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	205.8	195.3	220.2	207.2	199.9	181.4	172.1	168.1	160.2	170.5	176.4	196.0	2,253.2
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	205.8	195.3	220.2	207.2	199.9	181.4	172.1	168.1	160.2	170.5	176.4	196.0	2,253.2

(x000) **Electric Consumption (kWh)**



(x000,000) **Gas Consumption (Btu)**



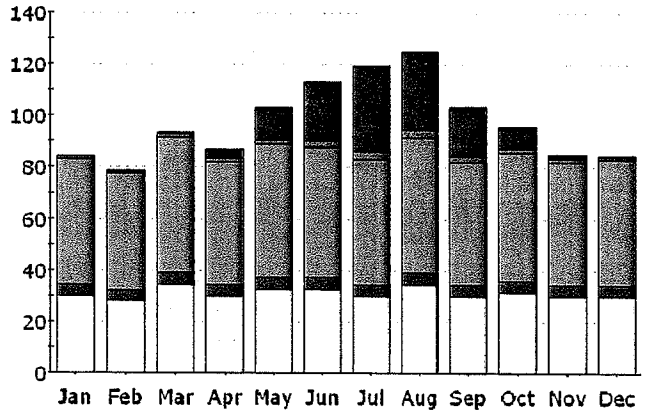
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.01	0.22	6.08	12.46	18.79	16.51	11.31	3.66	0.05	0.00	69.09
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	52.27	41.52	31.35	8.00	0.33	-	-	-	-	0.05	14.35	39.09	186.97
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	8.48	7.54	8.06	7.42	6.81	5.86	5.45	5.58	6.02	7.14	7.53	8.19	84.08
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	29.15	26.31	29.10	28.19	29.11	28.17	29.14	29.10	28.20	29.13	28.20	29.15	342.94
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	23.11	20.74	22.68	22.26	22.82	22.00	23.09	22.68	22.29	22.97	22.27	23.11	270.02
Total	113.01	96.11	91.20	66.09	65.15	68.49	76.47	73.87	67.81	62.95	72.40	99.54	953.10

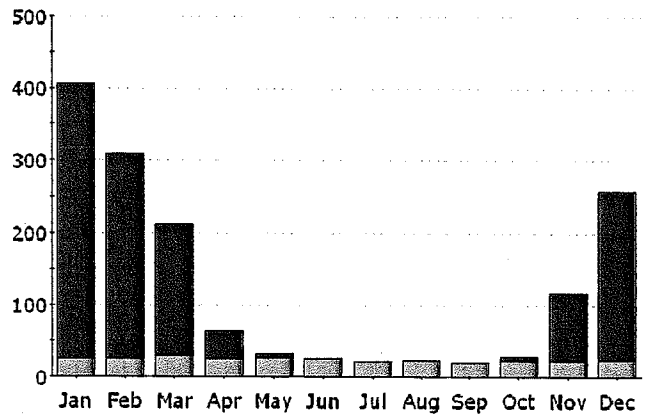
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	205.8	195.3	220.2	207.2	199.9	181.4	172.1	168.1	160.3	170.5	176.4	196.0	2,253.2
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	205.8	195.3	220.2	207.2	199.9	181.4	172.1	168.1	160.3	170.5	176.4	196.0	2,253.2

(x000) **Electric Consumption (kWh)**



(x000,000) **Gas Consumption (Btu)**



Electric Consumption (kWh x000)

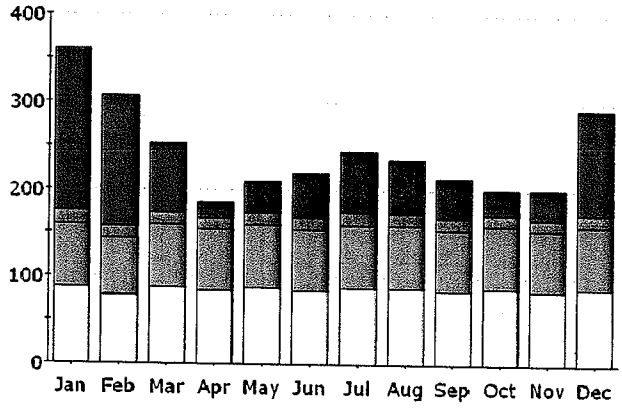
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	0.5	3.5	12.6	22.6	33.1	30.1	19.3	8.4	1.6	0.6	132.2
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	1.1	1.0	1.2	1.1	1.7	2.3	3.3	2.9	1.8	1.3	1.1	1.1	19.8
Pumps & Aux.	0.1	0.1	0.1	0.1	0.0	-	-	-	0.0	0.0	0.1	0.1	0.6
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	48.8	45.3	52.7	48.0	51.4	50.6	48.8	52.7	48.0	50.1	48.0	48.8	593.1
Task Lights	4.1	3.9	4.8	4.1	4.6	4.6	4.1	4.8	4.1	4.4	4.1	4.1	51.8
Area Lights	30.1	28.5	34.2	30.0	32.8	32.8	30.1	34.2	30.0	31.5	30.0	30.1	374.3
Total	84.2	78.8	93.5	86.8	103.1	112.9	119.4	124.7	103.3	95.6	85.0	84.7	1,171.9

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	380.0	284.4	180.1	37.8	4.3	0.1	0.1	-	0.2	6.3	94.2	232.8	1,220.2
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	25.9	25.3	30.5	26.2	26.9	25.0	21.4	23.4	20.4	22.2	22.7	24.4	294.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	405.9	309.7	210.6	64.1	31.2	25.1	21.5	23.4	20.6	28.5	116.9	257.1	1,514.6

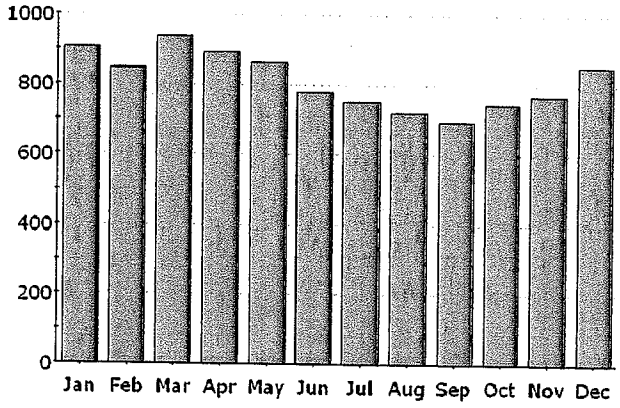
(x000)

Electric Consumption (kWh)



(x000,000)

Gas Consumption (Btu)



Area Lighting
Task Lighting
Misc. Equipment
Exterior Usage
Pumps & Aux.
Ventilation Fans
Water Heating
Ht Pump Supp.
Space Heating
Refrigeration
Heat Rejection
Space Cooling

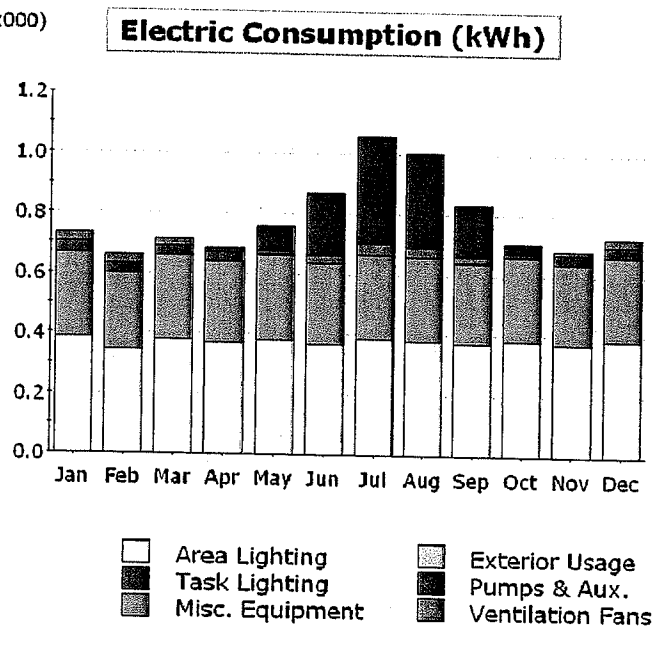
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	0.7	-	2.0	7.1	34.6	50.8	70.1	61.6	45.1	24.4	6.2	2.7	305.1
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	184.7	149.1	76.7	11.6	1.5	0.0	-	-	0.1	3.6	27.9	116.3	571.6
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	15.8	14.0	13.6	12.2	13.6	13.8	14.7	14.5	13.6	13.4	12.4	14.3	165.9
Pumps & Aux.	0.1	0.1	0.1	0.1	0.0	-	-	-	0.0	0.0	0.1	0.1	0.6
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	71.8	64.9	71.8	69.5	71.8	69.5	71.8	71.8	69.5	71.8	69.5	71.8	845.6
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	87.3	78.8	87.3	84.5	87.3	84.5	87.3	87.3	84.5	87.3	84.5	87.3	1,027.7
Total	360.5	306.9	251.5	184.9	208.9	218.5	243.9	235.2	212.8	200.5	200.5	292.4	2,916.6

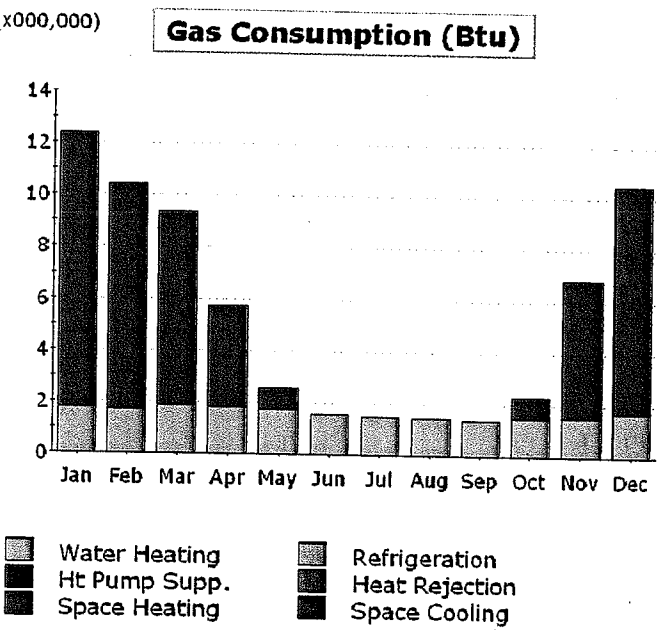
Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	905.5	845.9	938.1	892.7	862.6	777.4	752.0	719.7	694.0	744.0	768.8	852.7	9,753.3
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	905.5	845.9	938.1	892.7	862.6	777.4	752.0	719.7	694.0	744.0	768.8	852.7	9,753.3

(x000)



(x000,000)



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	0.00	0.08	0.21	0.35	0.31	0.17	0.03	-	-	1.15
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	0.03	0.03	0.02	0.01	0.01	0.02	0.04	0.03	0.02	0.00	0.01	0.03	0.26
Pumps & Aux.	0.04	0.03	0.03	0.03	0.01	-	-	-	0.00	0.01	0.03	0.03	0.22
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	0.28	0.25	0.28	0.27	0.28	0.27	0.28	0.28	0.27	0.28	0.27	0.28	3.27
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	0.39	0.35	0.38	0.37	0.38	0.37	0.38	0.38	0.37	0.38	0.37	0.39	4.50
Total	0.73	0.66	0.71	0.68	0.76	0.87	1.06	1.00	0.83	0.70	0.68	0.72	9.40

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	10.61	8.72	7.42	3.94	0.82	0.01	-	-	-	0.80	5.29	8.79	46.40
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	1.77	1.68	1.89	1.78	1.72	1.56	1.48	1.44	1.38	1.47	1.52	1.69	19.37
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	12.38	10.40	9.32	5.72	2.54	1.57	1.48	1.44	1.38	2.26	6.81	10.47	65.77

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M E M O R A N D U M

TO: Holly Johnson, MEPA

cc: Alicia McDevitt, MEPA
Phil Weinberg, DEP
Nancy Baker, DEP
Meg Lusardi, DOER

FROM: Edward Marsteiner

DATE: December 10, 2008

RE: **Reading Woods – Additional GHG Information**

The Proponent has compiled the following additional information based on recent GHG related discussions between Doug Vigneau of VHB and Holly Johnson of MEPA:

Photovoltaic Financial Modeling

In addition to discussions with specialty energy consultants, the Proponent also thoroughly evaluated the programs and benefits offered through the Massachusetts Technology Collaborative/Renewable Energy Trust. The "PV Calculator" and "Non-Residential Solar Photovoltaic Project Simple Financial Model" were used to estimate the cost and potential revenue generation from a photovoltaic project at the Project. A 500kW system was initially contemplated to serve the entire site but was quickly determined to be impractical. A 50kW system for the office component was then selected for evaluation based on a review of other similarly sized systems currently operating in Massachusetts as highlighted on the MTC website. While higher than the rate we currently pay, we did assume an "Avoided Electricity Cost" of $0.15 per kWh and we also took credit for $0.04 per kWh as "Renewable Energy Certificate (REC) Revenue". Since Reading Municipal Light Department does not participate in any type of photovoltaic program, it is unlikely that a REC credit would be achievable. As seen

in the attached PV financial model, even with these relatively aggressive assumptions, a 50kW system would have both a negative NPV (-$91,991) and a 22 year simple payback. The calculations assume full tax credit benefits but no rebate savings since Reading Municipal Light Department is not part of the Renewable Energy Trust.

The following specific requests were also made for additional information:

Question: What would be the corresponding reduction in CO2 associated with using a PV system?
Answer: Since a PV system was deemed not feasible for this project, no further analysis, including CO2 modeling, was completed.

Question: Would the PV analysis be different if the Proponent were a long term owner/operator of the system?
Answer: The Proponent is a local developer whose objective is to own and operate the Project long term. The negative NPV and low return on cost (1.5%) are not desirable under any scenario.

Question: Does the building orientation and structure (i.e. roof load) allow a PV alternative in the future?
Answer: The building orientations (east-west axis) are ideal for a PV application. Limited obstructions in the southerly direction also benefit the site from a PV perspective. The Proponent has discussed a PV system with their structural and MEP (mechanical/electrical/plumbing) engineers to better understand building modifications needed to allow future PV uses. Longer runs for plumbing and HVAC vents create significant challenges in the residential product. Wind and weight loads also create greater challenges for the wood frame residential products. Given the lack of funding for PV projects in Reading, it is difficult for the Proponent to commit to upfront building upgrades and additional design costs. That being said, the Proponent will strongly consider designing the office component to support a future PV system.

Question: Under the Global Warming Solutions Act, the RMLD may be able to buy into renewable energy rebates in the future. The Proponent is encouraged to discuss this possibility with the RMLD.
Answer: The Proponent has had discussions with the RMLD on the topic of future incentive programs. The RMLD indicated that it is unlikely they will buy into State level rebate programs unless the cost of such programs is to come down. They estimated that the current cost of such programs to rate payers would be close to 2.5mil/kWh which would represent a significant increase in rate payers bills. The RMLD is however in the process of considering their own locally based energy incentive programs. They are currently working on a program that would

set aside up to $600k to be used toward energy efficiency measures in their service area. Although they are still working through the details of an incentive program, they do anticipate some funding for photovoltaic applications.

Question/Comment: Please provide the 2012 Equest data for the South Apartment Building.
Answer: The data is presented for both the south and north apartment buildings in Attachment C of the SEIR under the Stationary Source Results/Summary on the sheet that shows "Code Compliant" and Build Conditions with Improvements. The South Apartments are referred to as "Reading_2012BuildMit_Apartments_s".

Question: Why do the two apartment buildings have the same energy use while having slightly different square footages?
Answer: The square footage for these buildings is close enough that the energy output for both buildings results in the same CO2 emissions from the EQUEST model.

Question: What HVAC systems are proposed within the apartments and the townhouses?
Answer: The mechanical system proposed for Arborpoint at Reading Woods is a through-wall ducted system which provides economical gas-fired forced hot air heat and electric air conditioning utilizing a high efficiency compressor. Because this is a self-contained packaged system, there are no unsightly components visible from the exterior and its operation is quiet from the outside and within the residence. This system provides individual comfort control to the resident and the utilities serving the system are separately metered so the resident only pays for what they use. A similar system will employed at the townhomes with one slight difference. An exterior compressor will be mounted outdoors for the unit air conditioning.

Question: Is the Proponent still looking for information on third party power purchase opportunities?
Answer: The Proponent appreciates the recent efforts of MEPA staff in providing some initial contact information for third party solar providers. The Proponent will continue investigating and researching this option.

Please feel free to contact me directly (617)559-5026 with any additional questions or comments.

Attachments.

DRAFT 5.0 Non-Residential Solar Photovoltaic Project Simple Financial Model (02/07/08)
DATA ENTRY AND FINANCIAL SUMMARY

Key

Entry Cells	
Cells Draw Data from Another Worksheet	
Calculation Cells (Not for Entry)	

Select Taxable or Non-Taxable Entity	[illegible]	
Project and Customer Cost Assumptions		
Solar Photovoltaic System Size	50,000	Watts (DC STC)
Total System Cost/Watt	$ 7.50	$/Watt (DC STC)
Total System Cost	$ 375,000	
MTC Rebate Assumptions		
MTC Scenario A: Non-Taxable Rebate	$ [illegible]	$/Watt (DC STC)
Scenario A Rebate	$ -	
MTC Scenario B: Taxable Rebate	$ [illegible]	$/Watt (DC STC)
Scenario B Rebate	$ -	
Project Performance and Savings/ Cost Assumptions		
Annual Net Capacity Factor	14.0%	kW (DC STC) to kWh AC
Annual Production Degradation	0.50%	%
Project Life	[illegible]	Years
Electicity Revenue (Avoided Costs)	$ 0.15	$/kWh
Electricity Revenue (Avoided Costs) Annual Adjustor	[illegible]	%
Renewable Energy Certificate (REC) Revenue	$ 0.04	$/kWh
REC Revenue Annual Adjustor	[illegible]	%
REC Revenue Term	[illegible]	Years (must be equal to or less than project life)
Annual Operations and Maintenance Cost	$ 250	$/Year
Annual Operations and Maintenance Adjustor	[illegible]	%
Future Inverter Replacement Cost	$ 0.75	$/Watt (DC STC)
Inverter Life, Replace Every X Years	15	Year (must be equal to or less than project life)

Scenario Definitions

Scenario A: Non-Taxable Rebate - Assumes that the state rebate is non-taxable, but is subtracted from the cost basis for purposes of determining tax credits and accelerated depreciation.

Scenario B: Taxable Rebate - Assumes that the state rebate is taxable, but is not subtracted from the cost basis for purposes of determining tax credits and accelerated depreciation.
Both Scenarios assume that the project owner can use both federal and state tax benefits

Tax Assumptions							
Federal Tax Rate	35%						
State Tax Rate	[illegible]						
Effective Tax Rate	41%						
Federal Tax Credit	30%						
State Tax Deduction	100%						
5 Year Accelerated Depreciation Schedule (MACRS)	20.00%	32.00%	19.20%	11.52%	11.52%	5.76%	
Financing Assumptions							
% Financed w/ Cash	100%						
% Financed w/ Loan	0%						
Loan Interest Rate	[illegible]						
Loan Period	20	Years (must be equal to or less than project life)					
Scenario A Net Cost	$ 375,000						
Scenario A Loan	$ -						
Scenario B Net Cost	$ 375,000						
Scenario B Loan	$ -						
Customer Discount Rate	[illegible]						

Solar Project Financial Analysis Summary	
Scenario A: Net Present Value	$ [illegible]
Scenario A: Simple Payback (100% Cash only)	Year 22
Scenario A: Estimated Return on Equity	1.5%
Scenario A: Guess Return on Equity	[illegible]
Scenario B: Net Present Value	$ [illegible]
Scenario B: Simple Payback (100% Cash only)	Year 22
Scenario B: Estimated Return on Equity	1.5%
Scenario B: Guess Return on Equity	[illegible]

Disclaimer: This Unofficial Cash Flow Model is intended to provide non-residential entities that are considering the purchase and installation of solar energy equipment with a general understanding of possible financial implications of such purchase and installation. Those entities interested in learning more about the financial implications of the purchase and installation of solar energy equipment are urged to consult their own tax and financial experts. The information contained in the Unofficial Cash Flow Model may not be relied on by anyone for any purposes. Furthermore, the information contained in this model does not necessarily reflect the views of the Massachusetts Technology Collaborative or the Commonwealth of Massachusetts, and reference to any specific method does not constitute an implied or expressed recommendation or endorsement of it. Neither the Massachusetts Technology Collaborative nor the Commonwealth of Massachusetts make any warranties or representations, expressed or implied, as to the usefulness, completeness, or accuracy of any processes, methods or other information contained, described, disclosed, or referred to in this model. Finally, neither the Massachusetts Technology Collaborative nor the Commonwealth of Massachusetts makes any representation that the use of any product, apparatus, process, method, or other inforn

DRAFT 5.0 Non-Residential Solar Photovoltaic Project Simple Financial Model (02/07/08)
PRO FORMA AND PRODUCTION

Project Output	Start-Up 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Annual Generation (kWh)		61,320	61,013	60,708	60,405	60,103	59,802	59,503	59,206	58,910	58,615	58,322	58,030	57,740	57,452	57,164	56,879	56,594	56,311	56,030	55,749

Scenario A: Non-Taxable Rebate; Pro Forma Project Economics

	Start-Up 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
INCOME STATEMENT																					
Electricity Revenue (Avoided Cost)		$ 9,198	$ 9,427	$ 9,661	$ 9,901	$ 10,147	$ 10,399	$ 10,657	$ 10,922	$ 11,194	$ 11,472	$ 11,757	$ 12,049	$ 12,349	$ 12,655	$ 12,970	$ 13,292	$ 13,623	$ 13,961	$ 14,308	$ 14,664
REC Revenue		$ 2,453	$ 2,441	$ 2,428	$ 2,416	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenue (Avoided Costs)		$ 11,651	$ 11,867	$ 12,089	$ 12,317	$ 10,147	$ 10,399	$ 10,657	$ 10,922	$ 11,194	$ 11,472	$ 11,757	$ 12,049	$ 12,349	$ 12,655	$ 12,970	$ 13,292	$ 13,623	$ 13,961	$ 14,308	$ 14,664
Operations & Maintenance Costs		$ (250)	$ (258)	$ (265)	$ (273)	$ (281)	$ (290)	$ (299)	$ (307)	$ (317)	$ (326)	$ (336)	$ (346)	$ (356)	$ (367)	$ (378)	$ (389)	$ (401)	$ (413)	$ (426)	$ (438)
Inverter Replacement Cost		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (37,500)	$ -	$ -	$ -	$ -	$ -
Total Operating Expenses		$ (250)	$ (258)	$ (265)	$ (273)	$ (281)	$ (290)	$ (299)	$ (307)	$ (317)	$ (326)	$ (336)	$ (346)	$ (356)	$ (367)	$ (37,878)	$ (389)	$ (401)	$ (413)	$ (426)	$ (438)
EBITDA		$ 11,401	$ 11,610	$ 11,824	$ 12,044	$ 9,866	$ 10,109	$ 10,359	$ 10,615	$ 10,877	$ 11,146	$ 11,421	$ 11,703	$ 11,992	$ 12,288	$ (24,908)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Federal Depreciation Expense		$ (63,750)	$ (102,000)	$ (61,200)	$ (36,720)	$ (36,720)	$ (18,360)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
EBIT		$ (52,349)	$ (90,390)	$ (49,376)	$ (24,676)	$ (26,854)	$ (8,251)	$ 10,359	$ 10,615	$ 10,877	$ 11,146	$ 11,421	$ 11,703	$ 11,992	$ 12,288	$ (24,908)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Interest Expense		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
EBT		$ (52,349)	$ (90,390)	$ (49,376)	$ (24,676)	$ (26,854)	$ (8,251)	$ 10,359	$ 10,615	$ 10,877	$ 11,146	$ 11,421	$ 11,703	$ 11,992	$ 12,288	$ (24,908)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Federal taxes saved/(paid)		$ 18,681	$ 32,002	$ 17,654	$ 9,016	$ 9,710	$ 3,206	$ (3,299)	$ (3,381)	$ (3,464)	$ (3,550)	$ (3,638)	$ (3,727)	$ (3,819)	$ (3,914)	$ 8,718	$ (4,110)	$ (4,211)	$ (4,315)	$ (4,422)	$ (4,531)
State taxes saved/(paid) [can not deduct federal depreciation expense]		$ (1,026)	$ (1,045)	$ (1,064)	$ (1,084)	$ (888)	$ (910)	$ (932)	$ (955)	$ (979)	$ (1,003)	$ (1,028)	$ (1,053)	$ (1,079)	$ (1,106)	$ 2,242	$ (1,161)	$ (1,190)	$ (1,219)	$ (1,249)	$ (1,280)
Net Income		$ (34,694)	$ (59,433)	$ (32,786)	$ (16,744)	$ (18,033)	$ (5,954)	$ 6,127	$ 6,279	$ 6,434	$ 6,593	$ 6,756	$ 6,922	$ 7,093	$ 7,269	$ (13,949)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
CASH FLOW STATEMENT																					
Cash From Operations																					
Net Income		$ (34,694)	$ (59,433)	$ (32,786)	$ (16,744)	$ (18,033)	$ (5,954)	$ 6,127	$ 6,279	$ 6,434	$ 6,593	$ 6,756	$ 6,922	$ 7,093	$ 7,269	$ (13,949)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Federal Depreciation Expense		$ 63,750	$ 102,000	$ 61,200	$ 36,720	$ 36,720	$ 18,360	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash Flow From Operations		$ 29,056	$ 42,567	$ 28,414	$ 19,976	$ 18,687	$ 12,406	$ 6,127	$ 6,279	$ 6,434	$ 6,593	$ 6,756	$ 6,922	$ 7,093	$ 7,269	$ (13,949)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Cash From Investing																					
Installed PV Cost	$ (375,000)																				
One Time State Solar Investment Tax Deduction (Actual Cash Value)		$ 21,938																			
One Time Federal Solar Investment Tax Credit		$ 112,500																			
Cash Flow From Investing	$ (375,000)	$ 134,438	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash From Financing																					
Loan Disbursement	$ -																				
Loan Repayment (Principle)		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash Flow From Financing	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Cash Flow	$ (375,000)	$ 163,494	$ 42,567	$ 28,414	$ 19,976	$ 18,687	$ 12,406	$ 6,127	$ 6,279	$ 6,434	$ 6,593	$ 6,756	$ 6,922	$ 7,093	$ 7,269	$ (13,949)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Cumulative Cash Flow	$ (375,000)	$ (211,506)	$ (168,939)	$ (140,525)	$ (120,550)	$ (101,862)	$ (89,456)	$ (83,329)	$ (77,050)	$ (70,617)	$ (64,024)	$ (57,268)	$ (50,346)	$ (43,253)	$ (35,984)	$ (49,933)	$ (42,301)	$ (34,480)	$ (26,467)	$ (18,255)	$ (9,841)

Scenario B: Taxable Rebate; Pro Forma Project Economics

	Start-Up 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
INCOME STATEMENT																					
Electricity Revenue (Avoided Cost)		$ 9,198	$ 9,427	$ 9,661	$ 9,901	$ 10,147	$ 10,399	$ 10,657	$ 10,922	$ 11,194	$ 11,472	$ 11,757	$ 12,049	$ 12,349	$ 12,655	$ 12,970	$ 13,292	$ 13,623	$ 13,961	$ 14,308	$ 14,664
REC Revenue		$ 2,453	$ 2,441	$ 2,428	$ 2,416	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenue (Avoided Costs)		$ 11,651	$ 11,867	$ 12,089	$ 12,317	$ 10,147	$ 10,399	$ 10,657	$ 10,922	$ 11,194	$ 11,472	$ 11,757	$ 12,049	$ 12,349	$ 12,655	$ 12,970	$ 13,292	$ 13,623	$ 13,961	$ 14,308	$ 14,664
Operations & Maintenance Costs		$ (250)	$ (258)	$ (265)	$ (273)	$ (281)	$ (290)	$ (299)	$ (307)	$ (317)	$ (326)	$ (336)	$ (346)	$ (356)	$ (367)	$ (378)	$ (389)	$ (401)	$ (413)	$ (426)	$ (438)
Inverter Replacement Cost		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ (37,500)	$ -	$ -	$ -	$ -	$ -
Total Operating Expenses		$ (250)	$ (258)	$ (265)	$ (273)	$ (281)	$ (290)	$ (299)	$ (307)	$ (317)	$ (326)	$ (336)	$ (346)	$ (356)	$ (367)	$ (37,878)	$ (389)	$ (401)	$ (413)	$ (426)	$ (438)
EBITDA		$ 11,401	$ 11,610	$ 11,824	$ 12,044	$ 9,866	$ 10,109	$ 10,359	$ 10,615	$ 10,877	$ 11,146	$ 11,421	$ 11,703	$ 11,992	$ 12,288	$ (24,908)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Federal Depreciation Expense		$ (63,750)	$ (102,000)	$ (61,200)	$ (36,720)	$ (36,720)	$ (18,360)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
EBIT		$ (52,349)	$ (90,390)	$ (49,376)	$ (24,676)	$ (26,854)	$ (8,251)	$ 10,359	$ 10,615	$ 10,877	$ 11,146	$ 11,421	$ 11,703	$ 11,992	$ 12,288	$ (24,908)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Interest Expense		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
EBT		$ (52,349)	$ (90,390)	$ (49,376)	$ (24,676)	$ (26,854)	$ (8,251)	$ 10,359	$ 10,615	$ 10,877	$ 11,146	$ 11,421	$ 11,703	$ 11,992	$ 12,288	$ (24,908)	$ 12,903	$ 13,221	$ 13,548	$ 13,882	$ 14,225
Federal taxes saved/(paid)		$ 18,681	$ 32,002	$ 17,654	$ 9,016	$ 9,710	$ 3,206	$ (3,299)	$ (3,381)	$ (3,464)	$ (3,550)	$ (3,638)	$ (3,727)	$ (3,819)	$ (3,914)	$ 8,718	$ (4,110)	$ (4,211)	$ (4,315)	$ (4,422)	$ (4,531)
State taxes saved/(paid) [can not deduct federal depreciation expense]		$ (1,026)	$ (1,045)	$ (1,064)	$ (1,084)	$ (888)	$ (910)	$ (932)	$ (955)	$ (979)	$ (1,003)	$ (1,028)	$ (1,053)	$ (1,079)	$ (1,106)	$ 2,242	$ (1,161)	$ (1,190)	$ (1,219)	$ (1,249)	$ (1,280)
Federal and State Tax on MTC Capital Cost Rebate		$ -																			
Net Income		$ (34,694)	$ (59,433)	$ (32,786)	$ (16,744)	$ (18,033)	$ (5,954)	$ 6,127	$ 6,279	$ 6,434	$ 6,593	$ 6,756	$ 6,922	$ 7,093	$ 7,269	$ (13,949)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
CASH FLOW STATEMENT																					
Cash From Operations																					
Net Income		$ (34,694)	$ (59,433)	$ (32,786)	$ (16,744)	$ (18,033)	$ (5,954)	$ 6,127	$ 6,279	$ 6,434	$ 6,593	$ 6,756	$ 6,922	$ 7,093	$ 7,269	$ (13,949)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Federal Depreciation Expense		$ 63,750	$ 102,000	$ 61,200	$ 36,720	$ 36,720	$ 18,360	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash Flow From Operations		$ 29,056	$ 42,567	$ 28,414	$ 19,976	$ 18,687	$ 12,406	$ 6,127	$ 6,279	$ 6,434	$ 6,593	$ 6,756	$ 6,922	$ 7,093	$ 7,269	$ (13,949)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Cash From Investing																					
Installed PV Cost	$ (375,000)																				
One Time State Solar Investment Tax Deduction (Actual Cash Value)		$ 21,938																			
One Time Federal Solar Investment Tax Credit		$ 112,500																			
Cash Flow From Investing	$ (375,000)	$ 134,438	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash From Financing																					
Loan Disbursement	$ -																				
Loan Repayment (Principle)		$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Cash Flow From Financing	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Net Cash Flow	$ (375,000)	$ 163,494	$ 42,567	$ 28,414	$ 19,976	$ 18,687	$ 12,406	$ 6,127	$ 6,279	$ 6,434	$ 6,593	$ 6,756	$ 6,922	$ 7,093	$ 7,269	$ (13,949)	$ 7,632	$ 7,820	$ 8,014	$ 8,211	$ 8,414
Cumulative Cash Flow	$ (375,000)	$ (211,506)	$ (168,939)	$ (140,525)	$ (120,550)	$ (101,862)	$ (89,456)	$ (83,329)	$ (77,050)	$ (70,617)	$ (64,024)	$ (57,268)	$ (50,346)	$ (43,253)	$ (35,984)	$ (49,933)	$ (42,301)	$ (34,480)	$ (26,467)	$ (18,255)	$ (9,841)

DRAFT 5.0 Non-Residential Solar Photovoltaic Project Simple Financial Model (02/07/08)

DEBT SCHEDULES

Scenario A Loan: Debt Schedule	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Debt Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Principle	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interest	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Ending Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Scenario B Loan: Debt Schedule	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Beginning Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Debt Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Principle	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Interest	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Ending Balance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Disclaimer: This Unofficial Cash Flow Model is intended to provide non-residential entities that are considering the purchase and installation of solar energy equipment with a general understanding of possible financial implications of such purchase and installation. Those entities interested in learning more about the financial implications of the purchase and installation of solar energy equipment are urged to consult their own tax and financial experts. The information contained in the Unofficial Cash Flow Model may not be relied on by anyone for any purposes. Furthermore, the information contained in this model does not necessarily reflect the views of the Massachusetts Technology Collaborative or the Commonwealth of Massachusetts, and reference to any specific method does not constitute an implied or expressed recommendation or endorsement of it. Neither the Massachusetts Technology Collaborative nor the Commonwealth of Massachusetts make any warranties or representations, expressed or implied, as to the usefulness, completeness, or accuracy of any processes, methods or other information contained, described, disclosed, or referred to in this model. Finally, neither the Massachusetts Technology Collaborative nor the Commonwealth of Massachusetts makes any representation that the use of any product, apparatus, process, method, or other inform

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June 27, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Reading Woods
PROJECT MUNICIPALITY	: Reading
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 14252
PROJECT PROPONENT	: Jacob Way, LLC c/o National Development
DATE NOTICED IN MONITOR	: May 21, 2008

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and Section 11.03 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of a mandatory Environmental Impact Report (EIR).

Project Description

As described in the Expanded Environmental Notification Form (EENF), the project consists of the redevelopment of the 24.8-acre Addison-Wesley-Longman office/warehouse complex into a mix of residential, senior living, and office space. The project site is located at the Route 128/Route 28 interchange (exit 38) and presently contains 208,000 square feet (sf) of office/warehouse space in six buildings. The project entails the construction of 202 apartment units in two buildings (including 41 affordable units) in compliance with the Commonwealth's 40R Smart Growth Zoning allowance in Reading's newly established Gateway Smart Growth District; 160 senior independent and assisted living units; 16 townhouses; and, 160,000 sf of Class A office space.

An EENF was previously filed for the project site in 2000 (EEA No. 12156), with a proposed redevelopment program of 600,000 sf of office space, a 300-room hotel and parking for 2,300 cars. A new EENF has been filed due to the lapse of time and substantial differences in the proposed project. Anticipated environmental impacts associated with the project include an additional 2.1 acres of impervious area (for a project site total of 13.5 acres), the generation of 3,890 new vehicle trips per day, the creation of 392 additional parking spaces (for a project site total of 1,061), demand for 78,680 gallons per day (gpd) of water, and the generation of 71,530 gpd of wastewater. The project will include the upgrade of the on-site stormwater management system, off-site and on-site traffic improvements, and improved infrastructure to service the project site.

Jurisdiction and Permitting

This project is subject to MEPA review as it requires a State agency action and will generate of 3,000 or more new average daily trips on roadways providing access to a single location (301 CMR 11.03(6)(a)(6)). The project will require an Indirect Vehicular Access Permit from the Massachusetts Highway Department (MassHighway) for impact to state-controlled roadways. The project will also require a Sewer Connection/Extension Permit from the Massachusetts Department of Environmental Protection (MassDEP). Coverage under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the U.S. Environmental Protection Agency will be required. Finally, the project must obtain an Order of Conditions from the Reading Conservation Commission, or in the case of an appeal, a Superseding Order of Conditions from MassDEP. The project is subject to the EEA/MEPA Greenhouse Gas (GHG) Emissions Policy.

The project will receive financial assistance from the Massachusetts Department of Housing and Community Development in accordance with M.G.L. Chapter 40R – Smart Growth Zoning and Housing Production Bylaw. Therefore, MEPA jurisdiction for this project is broad and shall extend to all aspects of the project that are likely, directly or indirectly, to cause Damage to the Environment.

Single EIR/Waiver Request

In accordance with Section 11.05(7) of the MEPA regulations, the proponent has submitted an Expanded ENF with a request that I allow the proponent to fulfill its EIR obligations under MEPA with a Single EIR, rather than require the usual two-step Draft and Final EIR process. The Expanded ENF received an extended public comment period pursuant to Section 11.06(1) of the MEPA regulations. I have reviewed the proponent's request for a Single EIR in accordance with Section 11.06(8) of the MEPA regulations, and I hereby find that the Expanded ENF meets the regulatory standards. I will therefore allow the proponent to prepare a Single EIR in fulfillment of the requirements of Section 11.03 of the MEPA regulations.

I acknowledge the proponent's efforts in developing the EENF, which contained considerable information that has been particularly helpful in understanding the project and defining the scope for the EIR. While I am allowing the proponent to prepare a Single EIR, I note the receipt of thoughtful and technical comments on the EENF that must be addressed in detail in the Single EIR. In particular, the proponent should investigate reducing greenhouse gas emissions associated with the project and make more substantial commitments to mitigate potential project environmental impacts. I retain my authority to require further review in the form of a Supplemental Environmental Impact Report if issues outlined in this Scope and in comments are not thoroughly addressed in the Single EIR.

SCOPE

General

The Single EIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this scope.

Project Description and Permitting

The Single EIR should include a detailed description of the proposed project and describe any changes to the project since the filing of the EENF. The Single EIR should provide a brief description and analysis of applicable statutory and regulatory standards and requirements, and a description of how the project will meet those standards. The Single EIR should include a list of required permits and approvals and provide an update on the status of each permit and/or approval.

Alternatives

The EENF included an alternatives analysis that compared a No-Build Alternative, the previously approved project (600,000 sf office, 300-room hotel; EEA No. 12165), and the Preferred Alternative. A comparison of each alternatives' impact on land, water, wastewater, traffic and air quality was provided. The Preferred Alternative has fewer water/wastewater, traffic and parking impacts than the previously approved project. The Preferred Alternative has been designed in accordance with the zoning created in conjunction with the designation of the Chapter 40R smart growth district.

The Single EIR will be required to re-evaluate the Preferred Alternative to investigate greater GHG reductions that those estimated in the EENF. Guidance for this alternatives analysis has been outlined in the MassDEP/Division of Energy Resources (DOER) comment letter on the EENF, and is described in the GHG section of this Certificate.

Traffic and Transportation

The EENF stated that the project will result in the generation of approximately 3,890 new vehicle trips on an average weekday. Access to the site will be provided from Jacob Way, proximate to the Route 128/Route 28 interchange. A MassHighway Indirect Vehicular Access Permit will be required for the project. The EENF included a transportation study that generally conforms to the EOEEA/EOTPW Guidelines for EIR/EIS Traffic Impact Assessments. This study included a description of nearby intersections, an inventory of nearby sidewalks, traffic volume data, vehicular crash history, accessibility to public transportation, trip generation estimates, level of service analyses, highway ramp merge and diverge and weaving analyses, and a discussion of mitigation measures. The EENF also outlined possible components of a Travel Demand Management (TDM) program.

Mitigation measures proposed include:

Widening the South Street eastbound and westbound approaches to two lanes. This will allow for an exclusive left turn lane and shared through/right turn lane in each direction;
Upgrading the traffic signal hardware at the intersection of Main Street/South Street; providing a left turn arrow designation for northbound traffic; and
If desired by the Town of Reading, reconfiguration of the intersection of South Street/Jacob Way as the primary route to the site, and treat South Street as a minor street under stop sign control.

The Single EIR should include detailed plans, preferably 80-scale, of the intersection improvements. The EOT comment letter has noted that the proposed widening of South Street at the Route 28/South Street intersection crosses a designated "no access" layout line; therefore a change in the State Highway layout will be required. Furthermore, EOT has indicated if future noise abatement devices such as sound barriers become necessary, the proponent will be responsible for constructing them.

While the EENF outlined possible TDM measures to be utilized on-site, the DEIR did not provide firm commitments to implementing these measures. I note the quality of suggestions offered in comment letters regarding an enhanced TDM program. The Single EIR must include clear, viable commitments to a robust TDM program. As recommended by EOT, the Single EIR should include plans to provide service between at least one of the three identified commuter rail stations within a three-mile radius of the project site. Such services should be provided to residents and employees of the site, with specific incentives geared toward office commuters. The Single EIR should include an update on discussions with the Massachusetts Bay Transportation Authority (MBTA) and the Reading Council on Aging to identify and provide potential on-site amenities to reduce vehicle trips.

Air Quality

The mesoscale air quality analysis evaluated existing and future levels of volatile organic compounds (VOC) and nitrogen oxides (NOx) emissions for the study area using the traffic volumes, delay and speed data presented in the project's TIAS. The results of the analysis reveal that future Build Condition VOC and NOx emissions are greater than the future No-Build Condition VOC and NOx emissions. Consistent with MassDEP guidelines, the Proponent will incorporate mitigation measures to reduce VOC and NOx emissions resulting from the project. These mitigation measures include construction of roadway and traffic signal improvements and a program of TDM measures. According to the EENF, the results of the mesoscale analysis demonstrate that the project complies with the federal Clean Air Act Amendments (CAAA) and the State Implementation Plan (SIP) for Massachusetts.

Greenhouse Gas Emissions (GHG)

The proposed project is also subject to EEA's Greenhouse Gas (GHG) Policy that requires proponents to quantify project-related GHG emissions and propose and quantify the impact of mitigation measures to reduce GHG emissions. The proponent submitted the results of the GHG analysis with the EENF. In the study, the proponent calculated GHG emissions from both mobile and stationary sources. The GHG emissions analysis evaluated the change in carbon dioxide (CO_2) emissions from project-related traffic and proposed building sources for the 2006 Existing, the 2012 No-Build, the 2012 Build and the 2012 Build with Improvements Conditions. The EENF used the EQUEST model to compute direct and indirect CO_2 emissions from stationary sources and the U.S. EPA's COMMUTER model Version 2 to estimate changes in CO_2 emissions due to roadway mitigation and traffic demand management measures.

As can be seen in the Table below, under the Build Condition, CO_2 emissions are expected to increase by 2,727.6 tons per year (tpy) from the No-Build Condition. With recommended mitigation measures, CO_2 emissions are estimated to be reduced by 151.9 tpy, a 0.6 percent reduction.

GHG Analysis	2006 Existing Condition	2012 No-Build	2012 Build	2012 Build/No-Build Difference	2012 Build with Improvements	2012 Build with Improvements/ Build Difference	Percent Reduction in GHG Emissions between Build and Build with Improvements
Mobile Sources	19,245.0	24,047.8	24,671.8	624.0	24,626.6	-45.2	0.2%
Direct/ Indirect Stationary Sources	0.0	0.0	2,103.6	2,103.6	1,996.9	- 106.7	5.1%
Total	19,245.0	24,047.8	26,775.4	2,727.6	26,623.5	- 151.9	0.6%

(All data expressed in tons per year)
Source: DEIR Table 4b-1.

As mitigation for GHG emissions from mobile sources, the proponent will widen roadways and reconfigure lane usage, upgrade traffic signal hardware, and implement a TDM program. The analysis submitted with the EENF did not quantify the GHG reduction due to proposed TDM measures, nor was it clear which TDM measures will be implemented in order to achieve the anticipated GHG reductions. In the Single EIR, the proponent should evaluate the impact of TDM measures following guidance in the EEA Policy.

The following mitigation measures were listed in the EENF to help reduce GHG emissions from stationary sources:

- use highly-reflective (high-albedo) roofing materials;
- maximize interior daylighting;
- window glazing;
- install high-efficiency HVAC systems;
- eliminate or reduce use of refrigerants in HVAC systems;
- incorporate super insulation;
- incorporate motion sensors and lighting and climate control;
- use efficient, directed exterior lighting; and
- track energy performance of building and develop a strategy to maintain efficiency.

The EENF also provided a list of possible sustainable building design and systems that may be utilized if they are determined to be practical and feasible. The EENF notes that indoor environmental air quality, water efficiency, and building energy efficiencies will be considered in project design. The proponent will also evaluate and provide sustainable design measures using the Leadership in Energy and Environmental Design (LEED®) Green Building Rating System as a general guideline. The proponent should clarify in the Single EIR which of the above-listed measures were evaluated using energy modeling software to determine the 2012 Build conditions.

The Proponent should demonstrate in the Single EIR that it has evaluated and committed to GHG-reduction measures consistent with the MEPA GHG Emissions Policy. The proponent should evaluate additional GHG mitigation alternatives as suggested by MassDEP/DOER in comment submitted on the EENF. The proponent should clarify which specific measures will be implemented, provide supporting modeling data that reflects the implementation of these measures, and clearly depict how these measures reduce GHG emissions in the 2012 Build with Mitigation scenario.

The Single EIR should respond to the comments by MassDEP/DOER with respect to:

- Pursuit of potential rebates for installation of highly energy efficient equipment from its natural gas provider, National Grid and the Reading Municipal Light Department;
- Explanation of building orientation and discussion of expected impacts on energy usage. If the buildings will be oriented to minimize energy usage, corresponding reductions in CO_2 emissions should be modeled;

- Additional information on the HVAC system(s), including heating systems of all the building types;
- Energy efficient lighting;
- Duct insulation, and if incorporated into the project, modeling results of CO_2 reductions;
- Incorporation of third-party building commissioning;
- Implementation of building energy management systems;
- Roof and wall insulation;
- On-site renewable energy sources. The Single EIR should evaluate the use of photovoltaic (PV) systems in accordance with the recommendations of DOER. The Single EIR should provide additional justification as to why wind, geothermal and/or biomass energy sources are not feasible for the project site; and
- District heating and cooling systems.

The Single EIR should reflect a commitment to pursue additional GHG mitigation measures in response to the modeling. If the proponent chooses not to model a specific mitigation measure recommended by MassDEP/DOER because it determines the measure to be infeasible for this particular project, the Single EIR must justify why modeling was not conducted. If, after further evaluation of a GHG mitigation measure using energy modeling software, the proponent does not propose to implement the measure, the Single EIR should provide technical and cost analyses to document the rationale for not making the commitment. I strongly encourage the proponent to consult with the MEPA Office, MassDEP and DOER prior to submission of the Single EIR with regard to the anticipated content of the GHG analysis.

The updated GHG analysis should clearly present modeling data inputs, the results of calculations used to quantify Existing Conditions, the Build Condition, and the impact of proposed emissions-reduction mitigation. If the proponent uses bar graphs, graphs should be produced in color so that the reader can understand the results and understand the potential CO_2 reductions associated with discrete mitigation measures. In the Single EIR, the proponent should fully explain any trade-offs inherent in the evaluation of GHG reduction measures, such as increased impacts on some resources to avoid impacts to other resources.

Wetlands

The existing wetlands on the site include approximately 4,743 sf of Bordering Vegetated Wetlands (BVW). This basin is regulated as a wetland under the Massachusetts Wetlands Protection Act (310 CMR 10.55). This wetland occurs in a stormwater detention area likely constructed during the original 1965 site development. No work is proposed within the BVW resource area; however work will occur within the 100-foot buffer zone to BVW and an existing stormwater discharge point to the wetland will remain. Stormwater discharges to the wetland will be improved in comparison to existing conditions as all stormwater flows will be directed through water quality treatment structures prior to release to the wetland. The proponent will be required to file a Notice of Intent with the Reading Conservation Commission prior to commencement of construction. The Single EIR should include a brief discussion of the significance of the wetland resources on site, including public and private water supply;

riverfront areas; flood control; storm damage prevention; fisheries; shellfishies; and wildlife habitat, and how these functions will be maintained in a post-construction state.

Stormwater

MassDEP has noted in its comment letter that the information included in the EENF on the stormwater management system generally shows that the proposed drainage system would comply with the Massachusetts Stormwater Management Regulations (SMR). MassDEP has requested that the Single EIR include expanded stormwater information to confirm compliance with the SMR standards for water quality and quantity impacts and Reading's Stormwater Program under the NPDES Phase II Stormwater General Permit. Stormwater design plans included in the Single EIR should be at an easily readable scale. In addition to the general response to comments, the proponent shall provide a detailed response to the "Stormwater" section of the comment letter dated June 20, 2008 submitted by MassDEP, and I hereby incorporate by reference the additional requests for information contained in the "Stormwater" section of that letter as part of the Scope of the Single EIR.

Wastewater

The project is projected to generate approximately 71,350 gpd of wastewater based upon MassDEP sewer design flows (314 CMR 7.15). Wastewater generated by the project will discharge into the 8-inch gravity sewer main in South Street, flow to the Sturges pump station and into the Massachusetts Water Resources Authority (MWRA) system and ultimately to the Deer Island Wastewater Treatment Facility. MassDEP requires projects that are adding significant new wastewater flow to assist in the infiltration/inflow (I/I) reduction effort and to ensure that additional wastewater flows are offset by the removal of I/I. MassDEP uses a minimum 4:1 ratio for I/I removal to new wastewater flow added. MassDEP has recommended that the proponent work with the Town of Reading and consult with MassDEP on this removal requirement. Within the EENF, the proponent proposed aligning I/I mitigation requirements with construction permits for individual buildings. The Single EIR should include details and estimated scheduling for I/I mitigation implementation. The MWRA has indicated that the program to offset the impact of the project's new flows should provide assurance that the new flows will not contribute to higher wet weather discharges from the downstream Town pump station in the short term, and will not contribute to the need for greater pumping capacity in the future. These requirements may require a modification to the existing Development and Infrastructure Agreement between the proponent and the Town of Reading to reflect the ratio of I/I mitigation.

Water Supply

Water usage associated with the project is estimated at 78,680 gpd. Potable and fire protection water requirements will continue to be served through the existing 8-inch water main in Jacob Way. The Town of Reading receives water from the Massachusetts Water Resources

Authority (MWRA), specifically, from the MWRA's Northern Intermediate High distribution system. There is sufficient capacity in the existing MWRA system to provide water for the project. MWRA has identified the need for a redundant pipeline and additional water tank storage for MWRA's Northern Intermediate High Service Area. The proponent should continue to work with the MWRA to coordinate MWRA's proposed improvements in the vicinity of the project site with those site improvements proposed by the project proponent.

I strongly encourage the proponent to commit to water-wise landscape irrigation technologies, including a commitment to the use of drought-tolerant native species, moisture sensors, rain gauges, and/or drip irrigation. Adiitionally, the Single EIR should provide additional information regarding the proponent's investigation of recycling grey water to reduce potable water demand for irrigation needs. The Single EIR should discuss grey water recycling feasibility, estimated volumes, and the potential benefits of and challenges to implementing this technology. If feasible, I encourage the proponent to outline a firm commitment to implement grey water recycling for the project.

Construction Period Impacts

The EENF included a discussion of potential construction period impacts (including but not limited to noise, vibration, dust, and traffic flow disruptions) and outlined feasible measures that could be implemented to eliminate or minimize these impacts. The Single EIR should clarify how such construction period impacts will be mitigated during the phased and/or possibly extended construction period. The proponent will comply with MassDEP's Solid Waste and Air Quality Control regulations during construction. The EENF indicated that solid waste/debris from construction activities will be managed and disposed of in accordance with MassDEP's Waste and Recycling and Standards (310 CMR 16.00 and 310 CMR 19.000).

I encourage the proponent to mitigate the construction period impacts of diesel emissions to the maximum extent feasible. This mitigation may be achieved through participation in the MassDEP Diesel Retrofit Program. The proponent should work with MassDEP staff to implement construction-period diesel emission mitigation, which could include the installation of after-engine emission controls such as oxidation catalysts or diesel particulate filters. If the proponent intends to participate in these initiatives, the Single EIR should include a clear commitment to such measures. The proponent has committed to utilizing construction machinery that uses Low Sulfur Diesel (LSD) fuel or Ultra-Low Sulfur Diesel (ULSD) fuel in off-road construction equipment.

Mitigation

The Reading Woods project provides numerous opportunities for mitigation of anticipated project impacts. The Single EIR should outline a clear commitment to viable and effective mitigation measures to offset impacts on traffic, water, wastewater, stormwater, and greenhouse gases. The Single EIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include a draft Section 61 Finding for each state

agency that will issue permits for the project. Each draft Section 61 Finding should contain clear commitments to implement mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation.

Comments/Circulation

The Single EIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the Single EIR should include a response to comments. This directive is not intended to, and shall not be construed to, enlarge the scope of the Single EIR beyond what has been expressly identified in this certificate.

The proponent should circulate the Single EIR to those parties who commented on the ENF, to any state agencies from which the proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations. A copy of the Single EIR should be made available for review at the Reading Public Library.

June 27, 2008
Date

Ian A. Bowles

Comments received:

06/19/2008	Gina Snyder
06/19/2008	Massachusetts Water Resources Authority
06/20/2008	Reading Advisory Committee on Cities for Climate Protection
06/20/2008	Massachusetts Department of Environmental Protection – NERO and the Division of Energy Resources (DOER)
6/23/2008	Executive Office of Transportation

IAB/HSJ/hsj

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
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DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

June 20, 2008

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Reading
Reading Woods
Jacob Way
EEA # 14252

Attn: MEPA Unit

Dear Secretary Bowles:

The Massachusetts Department of Environmental Protection (MassDEP) and the Executive Office of Environmental Affairs, Division of Energy Resources (DOER) have reviewed the Expanded Environmental Notification Form (EENF) submitted by Jacob Way LLC c/o National Development to demolish six buildings within an office and warehouse park formerly occupied by Addison-Wesley Longman in order to construct 202 housing units, 160 units of senior housing and assisted living facilities, 16 townhouses, and 160,000 square feet of office space, and parking for 1,061 vehicles on a 24.8 acre site in Reading (EEA# 14252). The mixed-use project is categorically included for the preparation of an environmental impact report (EIR), and the proponent is requesting approval to submit a single environmental impact report (SEIR). The Department and EEA-DOER provide the following comments.

Stormwater

Information in the EENF on the stormwater management system generally shows that the proposed drainage system would be in compliance with the Massachusetts stormwater management regulations (SMR). The Department requests that this information be expanded in the EIR to confirm compliance with the SMR standards for water quality and quantity impacts and Reading's Storm Water Program under the NPDES Phase II Stormwater General Permit. Stormwater design plans should be at an easily readable scale that includes all proposed best management practices, total suspended solids, pre-treatment calculations for best management practices (BMPs) in the areas of higher potential pollutant load, and infiltration calculations. Information in the EIR should be sufficient to affirm that the sizing of the particle separators (i.e., Stormceptor) is adequate to provide the TSS removal rating used in the calculations. It should be possible to review the calculations and stormwater plan with supporting information on the stormwater performance standards to demonstrate that the stormwater system design provides adequate protection for wetland resources in conformance with the stormwater regulations and NPDES permit.

The EIR also should provide information on source controls and pollution prevention measures, such as snow removal and disposal plans, and information on the street sweeping program and the TSS removal efficiency that is expected.

Wastewater

The EENF states that there is sufficient capacity in the existing collection system to accommodate the estimated 71,530 gpd of new wastewater flow from the Reading Woods project. Wastewater generated by the project will discharge into the 8-inch gravity sewer main in South Street to the Sturges pump station and into the MWRA system and ultimately to the Deer Island Wastewater Treatment Facility.

A sewer connection/extension permit is required from MassDEP because wastewater flow estimates for the project exceed the permit requirement of 50,000 gallons per day.

MassDEP, in cooperation with MWRA and its member communities (including Boston), are implementing a flow control program in the MWRA regional wastewater system, to remove extraneous clean water (e.g., infiltration/ inflow (I/I)) from the system. Routinely, MassDEP is requiring proponents that are adding significant new wastewater flow, (such as the Reading Woods project), to assist in the I/I reduction effort and to ensure that the additional wastewater flows are offset by the removal of I/I.

Currently, MassDEP is using a minimum 4:1 ratio for I/I removal to new wastewater flow added. This ratio may be increased if specific flow constrictions/overflows already exist in the sewershed to which the new flow is added. The proponent should therefore work with the town and consult with MassDEP on this issue. Assuming that a 4:1 ratio is utilized, the proponent will need to remove, or cause to be removed, 286,120 gpd of I/I. The EENF proposes to align I/I mitigation commitments with construction permits for individual buildings. Details and estimated scheduling for I/I mitigation implementation should be presented in the EIR.

Greenhouse Gas Emissions

This project requires an environmental impact report and a Massachusetts Highway Department (MHD) access permit; therefore, the project is subject to the MEPA Greenhouse Gas Emissions Policy and Protocol. The EENF included a GHG analysis, using the EQUEST model to compute direct and indirect CO_2 emissions from stationary sources and the USEPA's COMMUTER model Version 2 to estimate changes in CO_2 emissions due to roadway mitigation and traffic demand management measures. The final project is estimated to generate 1,9996.9 tons per year of CO_2 emissions from stationary sources and 24,626.6 tons per year of CO_2 emissions from transportation-related sources. This reflects a reduction from the base case CO_2 emissions for direct and indirect stationary sources of about 5.1 percent total, and 0.2 percent from transportation-related sources. The total CO_2 reduction from the base case is estimated at 0.6 percent.

A project at this early stage of development provides a multitude of opportunities for designing buildings and transportation management measures that reduce energy consumption and substitute renewable energy sources for fossil fuel sources. MassDEP/EEA-DOER believes

green developments are a smart financial investment. With a growing market demand for facilities that have reduced carbon footprints, rents are being driven higher for the US Building Council's Leadership in Energy and Environmental Design (LEED) certified buildings and Energy Star buildings than rents for less energy-efficient buildings, and occupancy rates are reported to be higher too by the CoStar Group[1], which released a study on rents, sales, and occupancy for energy efficient buildings in their commercial property database.

In a study from the New Buildings Institute (NBI), it was reported that building performance averages are 25-30 percent more efficient for LEED certified buildings than non-LEED buildings, and gold-platinum LEED rated buildings are 45 percent better than the national average, which approaches the interim goals of Architecture 2030, (a non-profit organization dedicated to reducing GHG emissions by changing the way developments are planned, designed, and constructed). The NBI study also shows a good correlation between modeled and actual building performance, providing assurances to developers and regulators that these measures will be effective. Additional information on energy efficiency/renewable rating systems is available at a number of websites including: http://www.buildinggreen.com/, http://energystar.gov/, www.architecture2030.org/. For new construction, core and shell, and commercial interiors relating to LEED certified buildings, information is available on the following website: http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222. In addition, for a Massachusetts perspective, consultation with green building experts can be obtained through the Green Building Roundtable: http://www.greenroundtable.org, located in Boston.

Although it is unnecessary to provide a complete technological and financial analysis of all GHG reduction mitigation measures, it will benefit the proponent to use functional and quantitative analyses and mock ups to assess feasible greenhouse gas reduction measures for the project type, starting with measures that offer the greatest energy reductions, and then considering opportunities to improve ongoing operations. These assessments should either lead to commitments to adopt the LEED and/or Energy Star elements, or the EIR should do a credible job in explaining why a particular efficiency or green power generation component is impracticable. Since there is, for example, no demonstration in the EENF that it would be technically infeasible or cost prohibitive to incorporate solar (photovoltaic) power on-site to generate energy for some of the building's functions, the EIR should consider the feasibility of implementing alternative energy sources for the project. The following websites are recommended for additional information on feasibility and life cycle cost analyses relating to PV and combined heat and power (CHP) district energy systems: the USEPA Combined Heat and Power Application Center, http://www.epa.gov/chp, RETScreen® International http://www.retscreen.net/ang/home.php, and the International District Energy Association (IDEA), www.districtenergy.org.

Even if on-site power generation is not feasible, many projects now routinely commit to orienting and designing buildings for energy efficiency, and this project has proposed to incorporate energy efficient exterior lighting, increased insulation, energy efficient windows, and high-albedo roofing materials. Additional information and other energy efficient measures, as

[1] The full study can be viewed at the CoStar Group Inc. website: http://www.costar.com/news/Article.aspx?id=D968F1E0DCF73712B03A099E0E99C679. CoStar Group Inc. is an information services organization serving commercial real estate in the United States and the United Kingdom.

explained below, also need further consideration. Additional information on building design energy reduction measures and standards is available on many websites, including the following: http://www.eere.energy.gov/, http://www.nahb.org,www.sbicouncil.org, http://www.aceee.org, http://www.ashrae.org/, http://www.coolroofs.org/ and http://www.ornl.gov.

Consistent with the GHG Policy the EENF has considered but does not appear to have modeled a mitigation alternative that would result in greater GHG reductions than the preferred alternative. Alternatives with greater energy efficiencies allow an understanding of potential opportunities for energy savings achievable by varying building design and layout strategies. Energy efficient techniques not selected should be thoughtfully explained to demonstrate that the alternative selected has avoided, minimized, and mitigated CO_2 emissions adequately.

The Division of Energy Resources (DOER) reviewed the EENF and notes that the project proponent correctly used the code compliant condition as the baseline for the Build Condition, per the MEPA Greenhouse Gas Emissions Policy and Protocol. However, the projected reductions in CO_2 emissions seem to be minimal from the Build Condition to the Full Build with Improvements condition (106.7 tons of CO_2/year, or about 5 percent reduction). Recognizing that the project is in the early stages of development with many specific building design aspects yet to be determined, it would be expected that further CO_2 reductions would be projected with more detailed designs. As the project moves forward, it is recommended that the project proponent contact the New Construction division of its natural gas provider, National Grid, and its municipal electric utility provider in Reading to take advantage of any potential rebates available for the installation of highly energy efficient equipment.

The EENF has provided some information regarding worthwhile mitigation measures for building design and operation at this early stage of development. In particular, the proponent is commended for maximizing interior daylighting, incorporating window glazing, and incorporating motion sensors and lighting and climate control into the project, appropriately noting their energy savings benefits in Table 4b-2. However, additional measures must be considered and supporting information must be provided to evaluate whether or not greater energy reductions can be reasonably achieved. DOER has identified several measures worthy of consideration in the subsequent filing, and adoption into the project, where feasible, as detailed below. In the event that the proponent is not able to adopt one of these measures, the subsequent filing must provide technical and cost analyses to document the rationale for not making a commitment to a mitigation recommendation.

Building Orientation: It is unclear in Table 4b-2 of the EENF if the buildings will be oriented to minimize energy use. The EIR needs to explain clearly how the buildings will be oriented, taking into consideration expected impacts on energy usage.

High-Efficiency HVAC Systems and Boiler units – No information was provided regarding the HVAC and heating systems for the different building. The EIR needs to provide information on the HVAC system(s), including the heating systems for all of the building types. Table 4b-2 of the EENF notes the potential for additional first costs with highly efficient systems, but it should be noted that more efficient units provide definite economic benefits over the life of the system.

Energy Efficient Lighting – The EENF notes that the project will evaluate incorporating efficient lighting such as fluorescent, metal halide or high-pressure sodium light sources for the exterior spaces. The EIR should provide the results of this evaluation and justification for any proposed alternatives. The EENF does not mention any efficiency measures related to interior lighting. For living spaces such as the townhomes, apartments and senior housing, compact fluorescent lighting fixtures should be provided. For common areas such as hallways or similar lighting used 24/7, compact fluorescent sconces may be most appropriate – these fixtures also reduce the need for frequent bulb replacements. For the office spaces, enhanced "super" T8 and/or T5 fixtures, combined with current generation light/motion sensors should be installed. Lighting sensors are particular appropriate for little-used spaces such as supply storage and utility rooms.

Duct Insulation – The EENF does not mention duct insulation. The subsequent filing should note that beyond code compliant duct insulation, construction would reflect that all ducts would be sealed with mastic, tested and then insulated, since duct leakage can be a major factor in energy losses.

Third Party Building Commissioning – It is unclear in Table 4b-2 if third party building commissioning will be incorporated into the project. The MA Code requires building commissioning, but it should be performed by a third party to ensure the commissioning process is thorough and energy performance of the building is maximized. The table indicates that there could be increased soft costs and additional scheduling/coordination required, but immediate and long-term benefits of third-part commissioning exceed these potential minor issues. The EIR should clearly note that third party building commissioning would be conducted.

Building Energy Management Systems - It is unclear in Table 4b-2 if ongoing tracking of energy performance of the building will be incorporated into the project. To ensure that the energy systems function as designed long term, a strategy should be developed for monitoring energy performance of all buildings where the energy systems are centrally controlled, possible through a building management system. A system for monitoring energy performance would be expected to pay for itself by eliminating potential inefficient building energy operations, such as simultaneous operation of heating and cooling systems in January. The EIR should clearly note if these strategies would be implemented.

Roof and Wall Insulation - The EENF notes that "super" insulation will be incorporated into the project. The EIR should note specifically what R-value will be used for the insulation. In general, insulation is very cost effective, and contributes significantly towards a building envelope that has the potential to yield the largest energy savings for building operations.

Incorporate on-site renewable energy sources into projects – Table 4b-2 also notes that some onsite renewable technologies may not be cost effective, but the EIR will need to show, at least that consideration has been given fully to these technologies. At a minimum, buildings should be oriented and roofs should be constructed to support the added weight of a solar photovoltaic (PV) system for potential installation during project construction or at a future date. The project is commended for incorporating high-albedo roof materials into the project. It should be noted that a rooftop PV system operates even more efficiently, due to added reflectivity with high-albedo roofs. Considering the support of subsidies through the Commonwealth Solar and RPS

programs, a life-cycle cost analysis should be done to evaluate the installation of a PV system during project construction under two scenarios: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party that will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. If neither of these scenarios is economically feasible at this time, the project should continue to consider the opportunity for installing PV at a future date and state their willingness to host a third-party owned PV array under a favorable power purchase agreement.

Other renewable technologies that should be considered are biomass or geothermal central heating and cooling for the apartment buildings and senior housing units. Both can provide significant reductions in greenhouse gas emissions over traditional systems, as well as greater efficiencies and savings in building space.

Assess District Heating and Cooling for Development – The mixed-use nature of this development could provide a good opportunity for a centralized heating and cooling plant. A centralized heating and cooling plant can provide hot and chilled water through distribution pipes to serve the full thermal loads of the entire development. This approach has been shown to significantly reduce the GHG emissions compared to individual boilers/chillers in each building and residential unit, and provides additional benefits in terms of operations and maintenance, fuel flexibility, and increased usable building space. The central thermal plant might be fueled by natural gas or biomass. The project proponents should evaluate this energy approach for its GHG emission benefits and economic feasibility.

Although the main sources of GHG associated with this proposed project include building heating and cooling, lighting, and vehicle travel to and from the proposed development, the energy required to provide potable water and treat wastewater also will be a source of GHG. To gain an understating of the correlation between water/wastewater volumes and energy use requirements, MassDEP has considered major utilities in the state and reviewed relevant research. For example, the Massachusetts Water Resources Authority (MWRA) estimates the average energy cost wastewater treatment at their Deer Island facility is 1.2 - 1.4 kWh/kgal. Similarly, a study of wastewater treatment plants in Wisconsin found that 1.5 kWh/kgal was required to treat wastewater in that state's wastewater treatment plants. This proposed development will generate approximately 71,350 gallons of wastewater per day or approximately 26,042,750 million gallons per year. Using an average energy cost of 1.3 kWh/kgal the project will require approximately 33,856 kWh over the course of a year. The project proponent should consider this additional energy use when proposing measures to mitigate the additional GHG emissions that will result from treating wastewater from this proposed project.

In addition, the MWRA estimates that treating and transporting drinking water at their John Carrol Water Treatment Plant requires 0.14 to 0.23 kWh/kgal. This is slightly less than the estimated 0.3 kWh/kgal required to treat and transport drinking water at the Worcester Water Filtration facility. As noted in the EENF, the proposed project will require 78,680 gallons of potable water per day, or 28,718,200 gallons per year. Using energy costs of about 0.2 kWh/kgal, approximately 5,743.6 kWh will be required to supply the proposed project with potable water annually. As with wastewater, the project proponent should consider this additional energy use

when proposing measures to mitigate the additional GHG emissions that will result from providing potable water for this proposed project. Mitigation measures for water and wastewater may include improvements to the distribution systems for the public water supply to eliminate un-accounted for water losses and infiltration and inflow (I/I) removal from sewer mains, in addition to water conservation measures.

In summary, the EIR needs to show that the preferred alternative would achieve significant reductions in GHG emissions with building designs, selection of building materials, and water and sewer infrastructure upgrades and efficiencies that reduce and/or offset the fossil fuel energy demand of the project. Revised GHG emissions modeling for this project should include for reconsideration the mitigation measures identified herein, in order to quantify the additional emissions reductions that are potentially achievable. In the event that the proponent is not able to adopt any of these measures, the EIR should provide technical and cost analyses to document the rationale for not making a commitment to a mitigation recommendation.

Construction and Demolition Waste Reduction

The project includes demolition and reconstruction, which will generate a significant amount of construction and demolition (C&D) waste. Although the EENF has not made a commitment to recycling construction debris, MassDEP requires C&D recycling activities to be incorporated as a sustainable measure for the project.

The project proponent is advised that demolition activities must comply with both Solid Waste and Air Pollution Control regulations, pursuant to M.G.L. Chapter 40, Section 54, which provides:

> Every city or town shall require, as a condition of issuing a building permit or license for the demolition, renovation, rehabilitation or other alteration of a building or structure, that the debris resulting from such demolition, renovation, rehabilitation or alteration be disposed of in a properly licensed solid waste disposal facility, as defined by Section one hundred and fifty A of Chapter one hundred and eleven. Any such permit or license shall indicate the location of the facility at which the debris is to be disposed. If for any reason, the debris will not be disposed as indicated, the permittee or licensee shall notify the issuing authority as to the location where the debris will be disposed. The issuing authority shall amend the permit or license to so indicate.

For purposes of implementing the requirements of M.G.L. Chapter 40, Section 54, MassDEP considers an asphalt, brick, and concrete (ABC) rubble processing or recycling facility, pursuant to the provisions of section (3) of 310 CMR 16.05 Site Assignment Regulations for Solid Waste Management Facilities, to be conditionally exempt from the site assignment requirements if the ABC rubble at such facilities is separated at the point of generation from other solid waste materials. Under 310 CMR 16.05(3), ABC can be crushed on-site with just a 30-day notification to MassDEP. However, the asphalt is limited to weathered bituminous concrete (no roofing asphalt) and the brick and concrete must be uncoated or not impregnated with materials such as roofing epoxy. If the brick and concrete are not clean, e.g., coated and/or impregnated, the material is defined as construction and demolition (C&D) waste and requires either a Beneficial Use Determination (BUD) or a Site Assignment and permit before it can be crushed.

Pursuant to the requirements of 310 CMR 7.02 of the Air Pollution Control Regulations, if the ABC crushing activities are projected to result in the emission of one ton or more of particulate matter to the ambient air per year and/or if the crushing equipment employs a diesel oil fired engine with an energy input capacity of three million or more British thermal units per hour for either mechanical or electrical power which will remain on-site for twelve or more months, then a plan application must be submitted to MassDEP for written approval prior to installation and operation of the crushing equipment.

In addition, if it appears that significant portions of the demolition project contain asbestos, the project proponent is advised that asbestos and asbestos-containing waste material are a special waste as defined in the Solid Waste Management regulations (310 CMR 19.061). Asbestos removal notification on permit form ANF 001 and building demolition notification on permit form AQ06 must be submitted to MassDEP at least 10 working days prior to initiating work. Except for vinyl asbestos tile (VAT) and asphaltic-asbestos felt and shingles, the disposal of asbestos containing materials within the Commonwealth must be at a facility specifically approved by MassDEP (310 CMR 19.061). No asbestos containing material including VAT, and/or asphaltic-asbestos felts or shingles may be disposed at a facility operating as a recycling facility, (310 CMR 16.05). The disposal of the asbestos containing materials outside the jurisdictional boundaries of the Commonwealth must comply with all the applicable laws and regulations of the state receiving the material.

The demolition activity also must conform to current Massachusetts Air Pollution Control Regulations governing nuisance conditions at 310 CMR 7.01, 7.09 and 7.10. As such, the proponent should propose measures to alleviate dust, noise, and odor nuisance conditions, which may occur during the demolition. MassDEP must be notified in writing, at least 10 days in advance of removing any asbestos. MassDEP also must be notified in writing, at least 10 days prior to any demolition work. The removal of asbestos from the buildings must adhere to the special safeguards defined in the Air Pollution Control Regulations (310 CMR 7.15 (2)).

Materials Management

MassDEP commends the applicant for recognizing the importance of materials management within its EENF filing for the Reading Woods project. In order to address GHG emissions related to materials management in the EIR, MassDEP requests that the applicant quantify the GHG impacts of materials management for the project development and projected future operation. By quantifying these impacts, the applicant's GHG mitigation efforts related to materials management can be more clearly identified and targeted appropriately. MassDEP seeks quantification to help guide changes in the project, which provide a comprehensive approach to materials management throughout the design, construction, and operational phases of the project. There are a number of resources available to help quantify GHG impacts associated with efficient materials management, including the USEPA Warm Model, available at the following website: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html, and the Building Reuse Calculator at: http://www.wastematch.org/calculator/calculator.htm.

During the **design phase**, MassDEP requests the applicant address waste reduction, environmentally preferable materials use, and the need to design for the storage and collection of

recyclables. In order to plan for waste reduction, the applicant should consider implementing a waste prevention purchasing policy, which may include management options for reducing shipping and packaging materials, and if necessary, managing excess materials through unused product return or donation.

MassDEP also requests that the EIR provide the following information:

- a list of the environmentally preferred products to be used,
- the GHG impacts of using these materials, and
- an explanation for why an expanded commitment to use additional EPP materials (including on-site use of demolition materials, regionally produced materials, recycled content materials) is not applicable or cannot be confirmed.

MassDEP appreciates that the applicant will be providing for the storage and collection of recyclables, but requests that more specific information be provided on the square footage of the proposed storage area and the types of materials expected to be stored and recycled. The EIR should, at a minimum, demonstrate that the storage area would be sufficient to manage waste materials currently prohibited from disposal in Massachusetts. A list of these materials can be found on the MassDEP website: http://www.mass.gov/dep/recycle/solid/regs0201.htm. In addition, MassDEP requests that the applicant identify how hazardous materials generated during facilities' operations, e.g., spent fluorescent bulbs, lubricants, waste oil, and other hazardous materials, would be managed and stored.

During the **construction phase**, MassDEP recommends that the applicant's material management efforts focus on material reuse and recycling. MassDEP requests the applicant commit to developing a construction waste management plan that fully complies with the Massachusetts Waste Bans and establishes a minimum reuse/recycling goal of 50 percent. The Department has demonstrated through pilot construction projects that this planning results in significant reductions in waste and cost savings for developers. Information and resources to assist in the development and implementation of a construction management plan can be found at http://www.mass.gov/dep/recycle/reduce/managing.htm#project.

In the **operations phase,** the applicant should develop and implement a waste management plan to ensure compliance with the MassDEP Waste Bans. The Department offers resources to assist in this area including planning tools, contracting language, and lists of service providers (http://www.mass.gov/dep/recycle/reduce/assistan.htm#reduce). The waste management plan should establish a target-recycling goal of more than 50 percent. This level of recycling has been achieved consistently in similar projects with demonstrated operational cost savings and capital asset appreciation benefits.

Construction Period Air Quality

MassDEP recommends that the project proponent participate in the MassDEP Diesel Retrofit Program to mitigate the construction-period impacts of diesel emissions to the maximum extent feasible. Diesel emissions contain fine particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), which has been found to exacerbate a number of heath conditions, such as asthma and respiratory ailments. $PM_{2.5}$ also contributes to lung damage and has been identified as a likely carcinogen.

MassDEP staff is available to work with the project proponent to implement construction-period diesel emission mitigation, which could include the installation of after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). For more information on these technologies, see: http://www.epa.gov/otaq/retrofit/verif-list.htm.

In addition, MassDEP reminds the project proponent that off-road equipment engines must use low sulfur diesel (LSD) fuel as of July 2007, as required by a 2004 regulation issued by the U.S. Environmental Protection Agency. On-road LSD fuel has a sulfur content of approximately 500 parts per million (ppm) in contrast to the 3,000 ppm sulfur level of current off-road diesel fuel. The use of LSD fuel, in conjunction with after-engine emission controls, can reduce $PM_{2.5}$ by an additional 25 percent beyond that obtainable with after-engine controls only. Project proponents may also use on-road ultra low sulfur diesel (ULSD) fuel, which has a sulfur content of 15 ppm.

The MassDEP and EEA-DOER appreciate the opportunity to comment on this proposed project. Please contact Jack Zajac (978) 694-3240 for further information on the wastewater issues. For further information on stationary source GHG issues, please contact Meg Lusardi at (617) 727-4732 x40164. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at (978) 694-3338.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Meg Lusardi, Gerry Bingham, EEA-DOER
Phil Weinberg, Nancy Seidman, John Felix, Christine Kirby, Greg Cooper, MassDEP-Boston
Kevin Brander, Jack Zajac MassDEP-NERO
Fran Fink, Town of Reading Conservation Commission

4b

Air Quality – Greenhouse Gas Emissions Analysis

Introduction

This chapter presents a summary of the assessment of greenhouse gas (GHG) emissions for the proposed Reading Woods development, in accordance with the Executive Office of Energy and Environmental Affairs (EEA) *MEPA Greenhouse Gas Emissions Policy and Protocol*. The GHG emissions analysis demonstrates that the Project is in compliance with the EEA policy on GHG emissions. The Project will include mobile and stationary source mitigation measures that will result in reduced GHG emissions for the build condition with improvements related to energy efficiency and other sustainable design and operation measures.

Greenhouse Gas Emissions Background

Global warming is well recognized by scientists around the world as a serious public health and environmental concern. As atmospheric concentrations of greenhouse gases rise globally, temperatures on earth are increasing. While the greenhouse effect has been beneficial to maintain global temperatures compatible to human life, recent increases in average temperatures due to human activities are causing great concern. Human impacts on the climate system include increasing concentrations of atmospheric greenhouse gases (e.g., carbon dioxide, chlorofluorocarbons and their substitutes, methane, nitrous oxide, etc.), air pollution, increasing concentrations of airborne particles, and land alteration. Hotter temperatures due to global warming are expected to lead to increased weather extremes, rises in sea level, precipitation changes, droughts and floods, worsening of air quality—all of which could significantly impact food and water resources, ecosystems and biodiversity, and human settlements.

MEPA Greenhouse Gas Emissions Policy and Protocol

In an effort to address the rising concern and awareness of the negative impacts of global warming and GHG emissions, the Commonwealth's Executive Office of

Energy and Environmental Affairs (EEA), under the *MEPA Greenhouse Gas Emissions Policy and Protocol*, took the lead on assessing and potentially mitigating for impacts related to GHG emissions from new developments.[1] This Policy requires project proponents to identify and quantify potential Project-related GHG emissions from mobile sources and direct and indirect stationary sources, and propose feasible measures to reduce GHG emissions be it through site/building design and/or building operations. The intent of the policy is to encourage project proponents to consider more carefully measures that would reduce or minimize GHG emissions.

The Commonwealth's effort to curb GHG emissions will:

- Help to slow the pace of global warming;
- Reduce fuel related emissions; and
- Promote the drive toward cleaner technologies.

As directed by the Policy, the following section assesses the Project-related GHG emissions from mobile sources and both direct and indirect stationary sources. While GHG emissions include several gases, Carbon Dioxide (CO2) was selected for evaluation because it is the most significant component of Project-related GHG emissions.

Greenhouse Gas Emissions Analysis Methodology

The air quality study for the Project calculates GHG emissions from mobile and stationary sources. The mobile source emissions are calculated by performing a yearly mesoscale analysis to evaluate the changes in CO2 emissions for the existing and future conditions within the study area. Similar to the mesoscale analysis for ozone, the future year of analysis was selected such that it is consistent with MEPA's policy, which requires that a project look five years into the future from the current year of analysis. The mesoscale analysis traffic (volumes, delays, and speeds) and emission factor data are developed for four conditions, Existing, No Build, Build, and Build with improvements conditions. The GHG analysis calculated the changes in CO2 emissions due to the roadway mitigation measures and TDM program using the EPA's COMMUTER[2] model Version 2. In addition to mobile sources, direct and indirect CO2 emissions from the Project's proposed building sources were calculated using the computer-based EQUEST model[3]. Direct emissions include those emissions from the facility itself such as boilers, heaters, and internal combustion engines. Indirect emissions includes CO2 emissions from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. The EQUEST model estimates the amount of energy consumed by each building from electricity and gas usage. Then the amount of consumed energy is

[1] The Policy requires that projects undergoing review under MEPA (Mandatory EIR) quantify the Project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions.

[2] COMMUTER, version 2.0 release from EPA (U.S. Environmental Protection Agency)

[3] EQUEST (the Quick Energy Simulation Tool), version 3.60 release from James J. Hirsch, DBA James J. Hirsch & Associates, Camarillo, CA

converted into the amount of CO2 emitted using the standardized conversion factor.[4] Total CO2 emissions are determined by combining the CO2 results from the mesoscale analysis with the CO2 emissions from the proposed direct and indirect building sources.

Mobile Source Analysis

The GHG mobile source analysis was conducted following procedures similar to the ozone mesoscale analysis. The mesoscale analysis estimated the area wide CO2 emissions from vehicle traffic for a time period of one year. The change in CO2 emissions from traffic were based on the average yearly traffic volumes, roadway lengths and vehicle emissions factors for existing and new trips for weekday and weekend conditions.

Mobile Source Emission Rates

Currently MOBILE6.2 has a simple estimate of CO2 emissions factors that do not vary by speed, temperature, fuel content, or the effects of vehicle inspection maintenance programs. It was determined that the study area was large enough to assume that variation in these parameters does not have a significant net effect. The emission rates calculated in this air quality study are adjusted to reflect Massachusetts' specific conditions. A detailed presentation of the MOBILE6.2 input and output data are presented in Attachment C.

Traffic Data

The air quality study used traffic data (volumes, delays, and speeds) developed for each analysis condition. The mesoscale analysis for CO2 emissions used a yearly traffic volume for weekday and weekend periods. Vehicle speeds are developed based upon traffic volumes, observed traffic flow characteristics, and roadway capacity. The traffic data used in the air quality study are presented in Attachment D. The detailed traffic analysis is presented in the Chapter 3, *Transportation.*

Stationary Source Analysis

The proposed Project will generate GHG emissions thru the use of electricity and fossil fuels. The stationary source analysis calculates project-related CO2 emissions from these building sources using the computer-based EQUEST model. These building sources include boilers, heaters and internal combustion engines. While the

[4] 1107 lb CO2/MWh was used to convert electricity consumption into the amount of CO2 emissions (ISO-New England Marginal Emissions Report). 117.08 lb CO2/Mbtu was used to convert gas consumption into the amount of CO2 emissions (The Energy Information Administration Documentation for Emissions for GHG).

proposed Project is in the planning stage, assumptions were made regarding the type of building construction, window and wall treatment, and rooftop equipment that would likely be used. The stationary source analysis calculates GHG emissions for two conditions: the Build, the Build with improvements. The Build condition represents the stationary source emissions that would occur if the proposed Project were to be built using typical construction materials and rooftop equipment. The Build with improvements condition represents the proposed Project emissions based upon the use of improved building materials and rooftop equipment.

Existing Conditions

The EEA and MEPA's GHG emissions policy calls for proposed projects to reduce, minimize, or mitigate these emissions. The calculation of the Existing condition emissions of mobile and stationary sources provides a base for which future years are evaluated.

Mobile Source Emissions

The mobile source analysis calculated the Existing CO2 emissions from the major roadways in the study area. These emissions, estimated to be 19,245.0 tons/year, establish a baseline to which future emissions can be compared. Table 4b-1 presents the existing CO2 analysis results for existing conditions.

Stationary Source Analysis

The GHG analysis calculated the Existing CO2 emissions for direct and indirect emissions from the existing stationary sources. Direct emissions included those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions included those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems.

Under the Existing Condition, the CO2 emissions were assumed to be 0.0 tons per year since the current building are vacant and are under limited operations.

Project Impacts

Future project related emission calculations are based upon changes in traffic and emission factor data as well as the Project's building sources. The traffic data include traffic volumes, vehicle miles traveled, roadway operations, and physical roadway improvements. The emission factor data included emission reduction programs, years of analysis, and roadway speeds. The Project's building sources included direct

emissions such as boilers, heaters, and internal combustion engines as well as indirect emissions from the consumption of energy. The following section reports the findings of the mobile source and stationary source analyses for the Project.

Mobile Source Emissions

The mobile source analysis estimated the future study area CO2 emissions due to the changes in traffic and emission data. Under the No-Build Condition, CO2 emissions were estimated to be 24,047.8 tons per year.

Under the Build Condition, the CO2 emissions were estimated to be 24,671.8 tons per year. Under the Build Condition with Improvements, the CO2 emissions were estimated to be 24,626.6 tons per year. This results in a decrease of 45.2 tons per year in CO2 emissions as compared to the Build Condition. This reduction is due to the geometric and operational improvements of the study area roadways and the TDM program. Table 4b-1 presents the mobile source analysis results for all conditions.

Stationary Source Analysis

The stationary source analysis calculated the No build, the Build and the Build with Improvements CO2 emissions for direct and indirect emissions from stationary sources. Direct emissions included those from stationary sources such as boilers, heaters and internal combustion engines. Indirect emissions included those from the consumption of electricity, heat, or cooling from off-site sources such as electrical utility or district heating and cooling systems. Under the No Build Condition, no changes to the stationary sources were assumed from the existing conditions; hence, the same CO2 emissions as in the Existing Condition were assumed, which were 0.0 tons per year. Under the Build Condition (equal to code compliant baseline in the MEPA policy), the CO2 emissions were estimated to be 2103.6 tons per year. Under the Build Condition with Improvements, the CO2 emissions were estimated to be 1,996.9 tons per year. This results in a decrease of 106.7 tons per year in CO2 emissions.

This reduction is due to the building mitigation measures discussed below. MEPA's GHG policy asked that the GHG analysis evaluate a project alternative with greater GHG emissions-related mitigation than the preferred alternative (Build Conditions) and should discuss how the preferred alternative is consistent with the objectives of MEPA's policy to avoid, minimize or mitigate damage to the environment to the maximum extent feasible. A project alternative with greater GHG emissions-related mitigation measures than the preferred alternative would likely include solar, wind, and geothermal measures. The planning level project information makes it difficult to calculate specific change in emissions. The DEP has suggested that the ENERGY STAR program, a joint program of the U.S. Environmental Protection Agency and the

U.S. Department of Energy, has developed strategies and products to help new buildings as well as existing buildings save energy and ultimately reduce the GHG emissions by as much as 35%. It should be noted that a portion of the ENERGY STAR program includes benefits from equipment that is related to the operation of the building, which were not included in the preferred alternative. The project proponent has committed to include Architectural Design/Treatments that will reduce GHG emissions and did consider additional mitigation measures, such as solar, wind, and geothermal. However, these measures were determined to not be feasible for the proposed project because of one or more of the following reasons: not an appropriate fit for the project location; the technology is not advanced for the building type; and these alternatives were found to be cost-prohibitive for a project of this scale.

Table 4b-1 presents CO2 emissions from mobile and direct and indirect stationary sources under all conditions.

Table 4b-1
Study Area CO2 Analysis Results *

	Existing Condition	No-Build Condition	Full Build Condition[1]	Difference of Full Build vs. No-Build	Full Build w/ Improvements Condition[2]	Difference of Full Build vs. Full Build with Improvements
Mobile Source Analysis	19,245.0	24,047.8	24,671.8	624.0	24,626.6	-45.2
Direct /Indirect Stationary Source	0.0	0.0	2,103.6	2,103.6	1,996.9	-106.7
Total	19,245.0	24,047.8	26,775.4	2,727.6	26,623.5	-151.9

Notes: *Tons per Year
1 Full Build Condition = Code Compliant
2 The proposed improvements are described in detail below.

Mitigation Measures

As part of EEA's GHG Policy, a "menu" of suggested mitigation measures is provided for consideration by project proponents. Table 4b-2 below summarizes this list of mitigation measures as they relate to greenhouse gas emissions and describes generally the benefits and limitations of these measures. A number of these measures are being considered and evaluated as part of the Project.

Table 4b-2
Summary of Greenhouse Gas Emissions Mitigation Measures

Mitigation Measure	Benefits	Limitations
Site Design & Layout		
Develop consistent with smart growth principles, including integrating transportation and land use.	Reduces transportation air quality impacts. Preserves open space. Walkability provides improved health.	Public transportation may be non-existent or have limited funds. Must be coupled with making public transit appealing/convenient.
Minimize energy use through building orientation	A building's orientation with relation to the sun will impact heating and cooling, natural ventilation, and daylighting.	Site constraints, including environmental constraints or natural resources.
Preserve open space and conserve/restore natural resources on-site	Reduces land and air quality impacts (indirect) from development activities. Preserves larger ecosystems.	Site constraints may limit preservation of open space or the ability to restore natural resources.
Minimize building/development footprint	Reduces energy demand and other environmental impacts.	May not be preferred development program.
Utilize Low Impact Development (LID) measures for stormwater management	A potential measure to reduce land and air quality impacts from construction activities (indirect) with less land altering means of stormwater management through more natural systems.	Not all LID measures are appropriate for all development sites.
Design water efficient landscaping	Reduces or eliminates the use of potable water for irrigation and energy used for irrigation systems.	May not be preferred aesthetically.
Architectural Design/Treatments		
Use high- reflective (high-albedo) roofing materials	Reduces heat island effect and air quality impacts through reduced cooling requirements.	Buildings in very cold climates may not experience year-round energy benefits and may increase heating costs.
Maximize interior daylighting through floor plates, increased building perimeter and use of skylights and light wells	Reduces the need for electric lighting of building interiors, resulting in reduced energy use and air quality impacts. Can improve worker productivity and reduce absenteeism and illness.	Must carefully balance heat gain and loss, glare control, visual quality and variations of daylight availability. Sometimes requires modeling/computer simulation.
Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance	Reduces energy demand through efficiency and, therefore, air quality impacts.	Determining the appropriate glazing or window treatment may require detailed daylighting modeling.
Incorporate super insulation to minimize heat loss	Reduces the loss of heat and cooling.	May have long-term environmental waste implications.
Use recycled content/reused /regional building materials and products	Reduces natural resources and the energy associated with manufacturing new materials, shipping indirectly reducing air quality.	Availability of products may be limited.
Building Systems		
Install high-efficiency HVAC systems	Limits the harmful environmental side effects of energy generation, distribution and consumption (i.e., pollution). Improve building comfort, while reducing operating costs.	Some energy-efficient measures may require additional first costs.
Eliminate use of chlorofluorocarbons (CFC)-	Reduces damage to the protective ozone	The uses of CFC-based refrigerants

based refrigerants in HVAC systems	layer in the earth's upper atmosphere.	have been phased out.
Do not use refrigerants or select refrigerants that do not emit pollutants contributing to ozone depletion and maintain those refrigerants	Minimizes the negative impacts of refrigerant use on ozone depletion and global warming.	May limit the types of HVAC systems available or require higher level of maintenance.
Reduce energy demand using peak shaving or load shifting strategies	Limits the harmful environmental side effects of energy generation, distribution and consumption (i.e., pollution). Improve building comfort, while reducing operating costs.	Some energy-efficient measures may require additional first costs.
Incorporate on-site renewable energy sources (e.g., solar, wind, geothermal)	Reduces dependence on fossil fuels and, therefore, reduces air quality impacts as a clean energy source. Provides for a more self-sufficient building with reduced energy costs.	May require upfront costs. Some technologies may not be cost effective.
Incorporate combined heat and power (CHP) technologies	Air emissions, including GHG emissions can be substantially reduced with CHP. CHP plants are small and usually sited unobtrusively inside existing buildings and plants. CHP can also improve indoor environmental quality.	Regulatory barriers exist that do not recognize CHP's environmental benefits.
Incorporate motion sensors and lighting and climate control	Energy efficient resulting in a reduction of GHG emissions.	May require more sophisticated systems and more maintenance.
Conserve water through water conserving fixtures, gray water reuse and/or rainwater harvesting.	Reduces water and energy use and chemical inputs at municipal water treatment facilities.	Local building and/or health codes/ordinances vary with regards to allowance of gray water or harvesting rainwater for sewage conveyance.
Conduct building commissioning	Results in improved design and construction coordination, reduced change-orders, and reduced operating costs. Ensures building systems will operate as intended and will result in occupant comfort and increase productivity.	Will result in increased soft costs and may require additional scheduling/coordination.
Building Operations		
Conduct ongoing measurement and verification of systems, or ongoing building commissioning	Results in optimal building operation and cost savings in terms of energy performance. Minimizes long-term air quality/environmental impacts.	Cost to institute an M&V Plan is strongly tied to complexity of building systems.
Provide storage and collection of recyclables	Diverts a significant portion of solid waste stream from landfills. Could result in reduced disposal costs and generate revenue.	Must encourage occupants to change behavior. Space constraints may limit storage and collection area.
Purchase appliances, computers with lowest energy rating (such as Energy Star-rated)	Reduces energy use and GHG emissions.	May restrict purchasing agreements or location of products.
Alternative Transportation		
Locate new buildings near public transportation and/or expand public transit onto or within walking distance	Allows for alternative means of transportation to the project site and reduces vehicle trips and impacts to air	Location may not be conducive to public transit.

	quality.	
Purchase alternative fuel and/or fuel efficient vehicles for fleet	The increased use of renewable and alternative fuels can result in significant reductions in air quality impacts from the use of petroleum-based fuels. By displacing petroleum fuels, many, although not all, of these fuels can provide reductions in greenhouse gas emissions.	To estimate the impacts of increases in renewable and alternative fuels on greenhouse gas emissions, the entire fuel lifecycle including fossil fuel extraction or feedstock growth, fuel production, distribution, and combustion should be accounted for.
Provide pedestrian and bicycle facilities on-site and connections off-site	Encourages alternative transportation and offsets air quality impacts from single-occupant vehicles.	Site constraints may limit the size/type of facilities.
Size parking capacity to meet, but not exceed, the local requirements and/or go for variance for reduced parking	Encourages the use of alternative modes of transportation and, therefore, reduces air quality impacts.	May not be desirable of tenants or customers.
Pursue opportunities for shared parking or banked parking	Reduces the need for extra parking and reduces development impacts to land.	May not be desirable of tenants or customers.
Parking management program, including preferential parking for carpool/vanpool or alternative fuel vehicles	Encourages alternative means of transportation and reduces single-occupancy vehicle trips and air quality impacts.	Dependent upon on occupant behavior.
Implement Transportation Demand Management (TDM) measures to encourage alternative modes of transportation (e.g., posting of information, transit subsides, telecommuting/flex time)	Encourages alternative transportation and offsets air quality impacts from single-occupant vehicles.	Dependent upon on occupant behavior.
Roadway improvements to improve traffic flow	Ensures traffic flow and reduces idling vehicles and air quality impacts.	Requires coordination with local, regional and/or state entities. May be costly.
Other		
Develop design and construction sustainable guidelines	Ensures implementation of sustainable project goals.	Requires consideration from the beginning of a project and upfront project team coordination/collaboration.
Provide no-idling truck zones at loading/off-loading	Reduces air quality impacts from idling vehicles.	Dependent upon driver behavior. Difficult to enforce.
Use ultra-low sulfur diesel fuel and/or emission reduction equipment for construction vehicles	Reduces temporary air quality impacts from construction vehicles.	May be costly.

Sources: MEPA Greenhouse Gas Emissions Policy and Protocol; Leadership in Energy and Environmental Design (LEED) New Construction Rating System, version 2.2.

Proposed Project Improvements

The EEA and MEPA GHG emissions policy encourages project proponents to identify and quantify measures that would reduce or minimize GHG emissions from mobile sources and direct and indirect stationary sources. The Proponent has developed physical and operational mitigation measures to be included in the Project

with Improvements. The following is a partial list of these mitigation measures that were considered in the air quality analysis. They include:

Architectural Design/Treatments

- Use highly-reflective (high-albedo) roofing materials for the residential and office buildings.
- Maximize interior daylighting through floor plates, increased building perimeter and use of skylights and light wells in the commercial and office areas.
- Incorporate window glazing to balance and optimize daylighting, heat loss and solar heat gain performance in all Project buildings.

Building Systems

- Install high-efficiency HVAC systems in commercial and office areas.
- Eliminate or reduce use of refrigerants in HVAC systems.
- Incorporate super insulation to minimize heat loss.
- Incorporate motion sensors and lighting and climate control.
- Use efficient, directed exterior lighting for all Project buildings.

Track energy performance of building and develop strategy to maintain efficiency.

Transportation Measures

- Widen roadways and reconfigure the lane usage
- Improve the traffic controls by upgrading the traffic signal hardware.
- Develop or support multi-use paths to and through site.
- Size parking capacity to meet, but not exceed local parking requirements and, where possible, seek reductions in parking supply through special permits or waivers.
- Pursue opportunities to minimize parking supply through shared parking or banked parking.
- Develop and implement a Marketing/Information Program that includes posting and distribution of ridesharing/transit information.
- Provide bicycle storage and shower/changing rooms.
- Join of form a Transportation Management Association.
- Provide a new transit service or support extension/expansion of existing transit (buses, trains, shuttles, water transportation).
- Provide on-site amenities such as banks, dry cleaning, food service, child care, etc.
- Provide a guaranteed ride home program to eliminate an often-cited deterrent to carpool and vanpool participation.
- Appoint an on-site TDM coordinator to help promote all above-mentioned measures.
- Provide preferential carpool and vanpool parking within the parking garages and spaces near office building entrances as a convenience to participants and to promote ridesharing.
- More Transportation-related improvement measures are discussed further in Chapter 3 *Transportation.*

As part of the mitigation commitments for the rezoning, the Project will include "LEED-equivalent"[5], or high-performance, buildings. By using the LEED checklist and green building rating system as verification, the Proponent will better ensure an energy-efficient building resulting in lower amount of greenhouse gas emissions from both mobile and stationary sources of the Project.

Conclusion

The air quality study demonstrates that the Project complies with the Executive Office of Energy and Environmental Affairs (EEA) policy on Greenhouse Gas emissions because it has included reasonable and feasible measures to avoid, minimize, or mitigate damage to the environment. The air quality study has quantified GHG emissions, analyzed proposed GHG emission mitigation measures, and committed to implementing feasible mitigation measures. The GHG emissions analysis demonstrates that the Project meets the EEA policy on GHG emissions because it has evaluated potential Project-related impacts associated with GHG emissions and includes mobile and stationary source mitigation measures that will reduced the CO2 emissions, as compared to the baseline condition. These GHG emission reductions are above and beyond what would have been achieved prior to the implementation of the EEA policy.

[5] To utilize the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Green Building Rating System as a guide when designing the building.

Greenhouse Gas

Vanasse Hangen Brustlin, Inc.

MOBILE6.2 Input Files

MA07OZ.inp

```
* Calendar Year 2007 Generic MOBILE6 input file for Mesoscale Build/No-Build Analyses
* Filename MA03OZ.INP created by Craig Woleader, MADEP 617-348-4046, craig.woleader@state.ma.us
*
**********    Header Section    **********
MOBILE6 INPUT FILE
*
POLLUTANTS      : CO2
DATABASE OUTPUT  :
WITH FIELDNAMES  :
AGGREGATED OUTPUT :
EMISSIONS TABLE  : MA07C02.tb1 REPLACE
REPORT FILE      : MA07CO2.txt REPLACE
*
RUN DATA
**********    Run Section #1    **********
> *** Summer 2007 ***

* Pollutant output format
EXPRESS HC AS VOC :

* Mass. specific user inputs -- require external data file
REG DIST        : MA_REG03.D
I/M DESC FILE    : MA_IM03.D

ANTI-TAMP PROG   :
00 84 50 11111 12222222 2 12 098. 22112122

STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP      : MA_LEV2.D
T2 EXH PHASE-IN  : LEV2EXH.D
T2 EVAP PHASE-IN  : LEV2EVAP.D
T2 CERT         : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP     : 68. 94.

* Fuel inputs
FUEL RVP        : 6.8
FUEL PROGRAM     : 2 N

**********    Scenario Section    **********
```

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)
CALENDAR YEAR : 2007
EVALUATION MONTH : 7
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0

SCENARIO RECORD : MA Freeway 3.0 mph
CALENDAR YEAR : 2007
EVALUATION MONTH : 7
AVERAGE SPEED : 3.0 Freeway 92.0 0.0 0.0 8.0

SCENARIO RECORD : MA Freeway 4.0 mph
CALENDAR YEAR : 2007
EVALUATION MONTH : 7
AVERAGE SPEED : 4.0 Freeway 92.0 0.0 0.0 8.0
(.scenario record repeated for Freeway Speeds through 60.7 mph)

SCENARIO RECORD : MA Freeway 60.7 mph (= maximum allowed freeway speed)
CALENDAR YEAR : 2007
EVALUATION MONTH : 7
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0

********** Summer Arterial **********

SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2007
EVALUATION MONTH : 7
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : MA Arterial 3.0 mph
CALENDAR YEAR : 2007
EVALUATION MONTH : 7
AVERAGE SPEED : 3.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : MA Arterial 4.0 mph
CALENDAR YEAR : 2007
EVALUATION MONTH : 7
AVERAGE SPEED : 4.0 Arterial 0.0 100.0 0.0 0.0
(.scenario record repeated for Arterial Speeds through 65 mph)

SCENARIO RECORD : MA Arterial 65.0 mph (= maximum allowed arterial speed)
CALENDAR YEAR : 2007
EVALUATION MONTH : 7
AVERAGE SPEED : 65.0 Arterial 0.0 100.0 0.0 0.0

********** End of This Run **********
END OF RUN

MA07OZ.inp

```
* Calendar Year 2012 Generic MOBILE6 input file for Mesoscale Build/No-Build Analyses
* Filename MA03_MES.INP created by Craig Woleader, MADEP 617-348-4046, craig.woleader@state.ma.us*
                Generic Input File for Summer/Winter Ozone and CO Build/No-Build Analyses for
                Calendar Year 2012
*
**************  Header Section  **************
MOBILE6 INPUT FILE

POLLUTANTS      : CO2
SPREADSHEET     :
REPORT FILE     : MA12CO2.txt REPLACE

RUN DATA
**************  Run Section #1  **************
> ************************************************
> ********************* SUMMER ********************
> ************************************************
* Pollutant output format
EXPRESS HC AS VOC :

* Mass. specific user inputs -- require external data file
REG DIST        : MA_REG03.D
I/M DESC FILE   : MA_IM03.D

ANTI-TAMP PROG  :
00 84 50 11111 12222222 2 12 098. 22112122

STAGE II REFUELING :
91 3 84. 84.

* Inputs for LEV II
94+ LDG IMP     : MA_LEV2.D
T2 EXH PHASE-IN : LEV2EXH.D
T2 EVAP PHASE-IN : LEV2EVAP.D
T2 CERT         : LEV2CERT.D

* Meteorological inputs
MIN/MAX TEMP    : 68. 94.

* Fuel Inputs
FUEL RVP        : 6.8
FUEL PROGRAM    : 2 N
**************  Scenario Section #1  **************
**************  Summer Freeway  **************
```

SCENARIO RECORD : MA Freeway 2.71 mph (= minimum allowed freeway speed)
CALENDAR YEAR : 2012
EVALUATION MONTH : 7
AVERAGE SPEED : 2.71 Freeway 92.0 0.0 0.0 8.0

SCENARIO RECORD : MA Freeway 3.0 mph
CALENDAR YEAR : 2012
EVALUATION MONTH : 7
AVERAGE SPEED : 3.0 Freeway 92.0 0.0 0.0 8.0

SCENARIO RECORD : MA Freeway 4.0 mph
CALENDAR YEAR : 2012
EVALUATION MONTH : 7
AVERAGE SPEED : 4.0 Freeway 92.0 0.0 0.0 8.0
(scenario record repeated for Freeway Speeds through 60.7 mph)

SCENARIO RECORD : MA Freeway 60.7 mph (= maximum allowed freeway speed)
CALENDAR YEAR : 2012
EVALUATION MONTH : 7
AVERAGE SPEED : 60.7 Freeway 92.0 0.0 0.0 8.0

********** Scenario Section #2 **********
********** Summer Arterial **********
SCENARIO RECORD : MA Arterial 2.5 mph (= minimum allowed arterial speed)
CALENDAR YEAR : 2012
EVALUATION MONTH : 7
AVERAGE SPEED : 2.5 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : MA Arterial 3.0 mph
CALENDAR YEAR : 2012
EVALUATION MONTH : 7
AVERAGE SPEED : 3.0 Arterial 0.0 100.0 0.0 0.0

SCENARIO RECORD : MA Arterial 4.0 mph
CALENDAR YEAR : 2012
EVALUATION MONTH : 7
AVERAGE SPEED : 4.0 Arterial 0.0 100.0 0.0 0.0
(.scenario record repeated for Arterial Speeds through 65 mph)

SCENARIO RECORD : MA Arterial 65.0 mph (= maximum allowed arterial speed)
CALENDAR YEAR : 2012
EVALUATION MONTH : 7
AVERAGE SPEED : 65.0 Arterial 0.0 100.0 0.0 0.0

********** End of This Run **********
END OF RUN

MOBILE6.2 Output Summary

2007 MA Summer
Mobile 6.2 Emission Factors

Arterial		Freeway	
Vehicle Speed (mph)	CO2's Emission Factor (g/veh-mile)	Vehicle Speed (mph)	CO2's Emission Factor (g/veh-mile)
2.5	546.10	2.5	546.10
3	546.10	3	546.10
4	546.10	4	546.10
5	546.10	5	546.10
6	546.10	6	546.10
7	546.10	7	546.10
8	546.10	8	546.10
9	546.10	9	546.10
10	546.10	10	546.10
11	546.10	11	546.10
12	546.10	12	546.10
13	546.10	13	546.10
14	546.10	14	546.10
15	546.10	15	546.10
16	546.10	16	546.10
17	546.10	17	546.10
18	546.10	18	546.10
19	546.10	19	546.10
20	546.10	20	546.10
21	546.10	21	546.10
22	546.10	22	546.10
23	546.10	23	546.10
24	546.10	24	546.10
25	546.10	25	546.10
26	546.10	26	546.10
27	546.10	27	546.10
28	546.10	28	546.10
29	546.10	29	546.10
30	546.10	30	546.10
31	546.10	31	546.10
32	546.10	32	546.10
33	546.10	33	546.10
34	546.10	34	546.10
35	546.10	35	546.10
36	546.10	36	546.10
37	546.10	37	546.10
38	546.10	38	546.10
39	546.10	39	546.10
40	546.10	40	546.10
41	546.10	41	546.10
42	546.10	42	546.10
43	546.10	43	546.10
44	546.10	44	546.10
45	546.10	45	546.10
46	546.10	46	546.10
47	546.10	47	546.10
48	546.10	48	546.10
49	546.10	49	546.10
50	546.10	50	546.10
51	546.10	51	546.10
52	546.10	52	546.10
53	546.10	53	546.10
54	546.10	54	546.10
55	546.10	55	546.10
56	546.10	56	546.10
57	546.10	57	546.10
58	546.10	58	546.10
59	546.10	59	546.10
60	546.10	60	546.10
61	546.10	61	546.10
62	546.10	62	546.10
63	546.10	63	546.10
64	546.10	64	546.10
65	546.10	65	546.10

NOTE: Emission factors were calculated by MOBILE6.2 and represent a composite vehicle type during summer conditions.

2012 MA Summer
Mobile 6.2 Emission Factors

Arterial		Freeway	
Vehicle Speed (mph)	CO2's Emission Factor (g/veh-mile)	Vehicle Speed (mph)	CO2's Emission Factor (g/veh-mile)
2.5	557.53	2.5	557.53
3	557.53	3	557.53
4	557.53	4	557.53
5	557.53	5	557.53
6	557.53	6	557.53
7	557.53	7	557.53
8	557.53	8	557.53
9	557.53	9	557.53
10	557.53	10	557.53
11	557.53	11	557.53
12	557.53	12	557.53
13	557.53	13	557.53
14	557.53	14	557.53
15	557.53	15	557.53
16	557.53	16	557.53
17	557.53	17	557.53
18	557.53	18	557.53
19	557.53	19	557.53
20	557.53	20	557.53
21	557.53	21	557.53
22	557.53	22	557.53
23	557.53	23	557.53
24	557.53	24	557.53
25	557.53	25	557.53
26	557.53	26	557.53
27	557.53	27	557.53
28	557.53	28	557.53
29	557.53	29	557.53
30	557.53	30	557.53
31	557.53	31	557.53
32	557.53	32	557.53
33	557.53	33	557.53
34	557.53	34	557.53
35	557.53	35	557.53
36	557.53	36	557.53
37	557.53	37	557.53
38	557.53	38	557.53
39	557.53	39	557.53
40	557.53	40	557.53
41	557.53	41	557.53
42	557.53	42	557.53
43	557.53	43	557.53
44	557.53	44	557.53
45	557.53	45	557.53
46	557.53	46	557.53
47	557.53	47	557.53
48	557.53	48	557.53
49	557.53	49	557.53
50	557.53	50	557.53
51	557.53	51	557.53
52	557.53	52	557.53
53	557.53	53	557.53
54	557.53	54	557.53
55	557.53	55	557.53
56	557.53	56	557.53
57	557.53	57	557.53
58	557.53	58	557.53
59	557.53	59	557.53
60	557.53	60	557.53
61	557.53	61	557.53
62	557.53	62	557.53
63	557.53	63	557.53
64	557.53	64	557.53
65	557.53	65	557.53

NOTE: Emission factors were calculated by MOBILE6.2 and represent a composite vehicle type during summer conditions.

Mobile Source Results: CO_2 Emissions

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Annual Total CO_2 Emissions Inventory in Tons per Year

Pollutant	2007 Existing Condition	2012 No-Build Alternative	2012 Build Alternative	2012 Build Alternative With Mitigation
Carbon Dioxide	19,245.0	24,047.8	24,671.8	24,626.6
Difference - Existing		4,802.8	5,426.8	5,381.6
Difference - No-Build			624.0	578.8

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Annual Weekend CO_2 Emissions Inventory in Tons per Year

Pollutant	2007 Existing Condition	2012 No-Build Alternative	2012 Build Alternative	2012 Build Alternative With Mitigation
Carbon Dioxide	3,753.7	4,690.4	4,812.1	4,803.3
Difference - Existing		936.8	1,058.4	1,049.6
Difference - No-Build			121.7	112.9

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Annual Weekday CO_2 Emissions Inventory in Tons per Year

Pollutant	2007 Existing Condition	2012 No-Build Alternative	2012 Build Alternative	2012 Build Alternative With Mitigation
Carbon Dioxide	15,491.3	19,357.3	19,859.7	19,823.3
Difference - Existing		3,866.0	4,368.4	4,332.0
Difference - No-Build			502.4	465.9

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

2012 Build Alternative With Mitigation

Link No.	Description	Roadway Link type	Roadway Link Length (miles)	Weekday Peak Traffic Data: Annual Weekday Peak VMT (veh-miles)	Wkdy Speed Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Weekday Off-Peak Traffic Data: Annual Weekday Off-Peak VMT (veh-miles)	Speed Off-Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Annual Weekend Peak (veh-miles)	Weekend Peak Traffic Data: Wkdy Speed Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Annual Weekend Off-Peak (veh-miles)	Weekend Off-Peak Traffic Data: Speed Off-Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)
1	Route 28 between Parker Road and Summer Avenue	2	0.65	3,640,589	30	557.53	2029737.84	1,142,998	40	557.53	637255.56	882,143	30	557.53	491821.09	276,957	40	557.53	154411.92
2	Route 28 between Summer Avenue and Hopkins Street	2	0.23	1,258,464	30	557.53	701631.26	395,107	40	557.53	220283.83	304,935	30	557.53	170010.65	95,737	40	557.53	53376.47
3	Route 28 between Hopkins Street and South Street	2	0.12	707,453	30	557.53	394426.08	222,112	40	557.53	123833.83	171,421	30	557.53	95572.47	53,819	40	557.53	30005.89
4	Route 28 between South Street and Elm Street	2	1.32	8,824,289	30	557.53	4919805.68	2,770,470	40	557.53	1544619.92	2,138,193	30	557.53	1192106.76	671,306	40	557.53	374273.29
5	Summer Avenue between eastern end and Main Street	2	0.58	224,869	20	557.53	125371.45	70,600	30	557.53	39361.56	54,488	20	557.53	30378.47	17,107	30	557.53	9537.61
6	Summer Avenue between Route 28 and Woburn Street	2	0.91	622,721	20	557.53	347185.63	195,509	30	557.53	109002.24	150,890	20	557.53	84125.75	47,373	30	557.53	26412.08
7	Hopkins Street between Summer Avenue and Route 28	2	0.32	239,510	20	557.53	133534.06	75,196	30	557.53	41924.29	58,035	20	557.53	32356.33	18,221	30	557.53	10158.58
8	Hopkins Street between Route 28 and South Street	2	0.30	209,923	20	557.53	117038.59	65,907	30	557.53	36745.38	50,866	20	557.53	28359.35	15,970	30	557.53	8903.69
9	Hopkins Street between South Street and North Avenue	2	1.22	849,959	20	557.53	473877.89	266,853	30	557.53	148778.48	205,952	20	557.53	114824.26	64,661	30	557.53	36050.17
10	South Street between eastern end and Hopkins Street	2	0.10	82,193	20	557.53	45824.89	25,805	30	557.53	14387.16	19,916	20	557.53	11103.72	6,253	30	557.53	3486.12
11	South Street between Hopkins Street and Route 28	2	0.23	183,284	20	557.53	102186.15	57,544	30	557.53	32082.32	44,411	20	557.53	24760.49	13,943	30	557.53	7773.79
12	South Street between Route 28 and Walnut Street	2	0.54	1,250,474	20	557.53	697176.55	392,598	30	557.53	218885.23	302,999	20	557.53	168931.24	95,130	30	557.53	53037.57
13	South Street between Walnut Street and Washington Street	2	0.67	717,973	20	557.53	400291.54	225,414	30	557.53	125675.35	173,970	20	557.53	96993.72	54,620	30	557.53	30452.10
14	Jacob Way between South Street and southern end	2	0.35	416,233	20	557.53	232062.51	130,680	30	557.53	72858.24	100,857	20	557.53	56230.53	31,665	30	557.53	17654.11
15	Washington Street between Mishawum Road and South Street	2	0.40	1,986,236	20	557.53	1107386.15	623,598	30	557.53	347674.44	481,280	20	557.53	268328.18	151,103	30	557.53	84244.19
16	West Street between South Street and Woburn Street	2	0.60	2,526,262	20	557.53	1408466.64	793,144	30	557.53	442201.54	612,133	20	557.53	341282.30	192,185	30	557.53	107148.83
17	Archestone Circle west of West Street	2	0.49	149,408	20	557.53	83299.19	46,908	30	557.53	26152.58	36,203	20	557.53	20184.03	11,366	30	557.53	6336.97
18	North Street between William Street and Route 28	2	1.21	369,975	20	557.53	206272.04	116,157	30	557.53	64761.08	89,648	20	557.53	49981.30	28,146	30	557.53	15692.11
19	North Street between Route 28 and Hopkins Street	2	0.49	149,825	20	557.53	83531.65	47,039	30	557.53	26225.56	36,304	20	557.53	20240.36	11,398	30	557.53	6354.65
20	Route 28 between North Street and Elm Street	2	0.43	131,479	30	557.53	73303.29	41,279	40	557.53	23014.27	31,858	30	557.53	17761.95	10,002	40	557.53	5576.53

Mesoscale CO2 Emissions (tons/year)

24626.6

Weekday CO2 Emission Inventory

VMT Emissions (tons/year)	Peak	Off-Peak
VMT = 31,390,282	14682.0	4609.6
Idle Emissions (tons/year)	**Peak**	**Off-Peak**
	414.54	117.1
	TOTAL	19823.3

Weekend CO2 Emission Inventory

VMT Emissions (tons/year)	Peak	Off-Peak
VMT = 7,606,107	3557.6	1116.9
Idle Emissions (tons/year)	**Peak**	**Off-Peak**
	100.45	28.4
	TOTAL	4803.3

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

2012 Build Alternative With Mitigation

Link No.	Description	Seasonally Adjusted Wkdy ADT (veh/day)	Seasonally Adjusted Wknd ADT (veh/day)	Annual Weekday Trips (veh/day)	Annual Weekend Trips (veh/day)	Wkdy Peak Period Factor	Wknd Peak Period Factor	Weekday Peak Traffic Data: Period Volume (vehicles)	Weekday Peak Traffic Data: Delay (sec)	Weekday Peak Traffic Data: Adjusted Delay (veh-sec)	Weekday Off-Peak Traffic Data: Period Volume (vehicles)	Weekday Off-Peak Traffic Data: Delay (sec)	Weekday Off-Peak Traffic Data: Adjusted Delay (veh-sec)	Weekend Peak Traffic Data: Period Volume (vehicles)	Weekend Peak Traffic Data: Delay (sec)	Weekend Peak Traffic Data: Adjusted Delay (veh-sec)	Weekend Off-Peak Traffic Data: Period Volume (vehicles)	Weekend Off-Peak Traffic Data: Delay (sec)	Weekend Off-Peak Traffic Data: Adjusted Delay (veh-sec)
1	Route 28 between Parker Road and Summer Avenue	28,092	16,855	7,304,031	1,769,823	0.76	0.76	5,558,795	6.2	34,186,588	1,745,237	5.54	9,659,885	1,346,939	6.2	8,283,673	422,884	5.54	2,340,664
2	Route 28 between Summer Avenue and Hopkins Street	27,390	16,434	7,121,412	1,725,573	0.76	0.76	5,419,811	3.5	18,969,339	1,701,601	3.15	5,360,044	1,313,262	3.5	4,596,417	412,311	3.15	1,298,780
3	Route 28 between Hopkins Street and South Street	29,496	17,697	7,668,904	1,858,235	0.76	0.76	5,836,484	3.9	22,470,465	1,832,420	3.47	6,349,335	1,414,225	3.9	5,444,766	444,009	3.47	1,538,493
4	Route 28 between South Street and Elm Street	33,904	20,342	8,815,021	2,135,948	0.76	0.76	6,708,746	23.4	156,984,668	2,106,275	21.06	44,358,150	1,625,581	23.4	38,038,593	510,367	21.06	10,748,321
5	Summer Avenue between eastern end and Main Street	1,967	1,180	511,333	123,900	0.76	0.76	389,155	19.7	7,666,345	122,179	17.73	2,166,230	94,295	19.7	1,857,614	29,605	17.73	524,894
6	Summer Avenue between Route 28 and Woburn Street	3,442	2,065	894,833	216,825	0.76	0.76	681,020	19.7	13,416,103	213,813	17.73	3,790,902	165,016	19.7	3,250,825	51,809	17.73	918,565
7	Hopkins Street between Summer Avenue and Route 28	3,793	2,276	986,143	238,950	0.76	0.76	750,512	97.9	73,475,159	235,631	88.11	20,761,404	181,855	97.9	17,803,596	57,095	88.11	5,030,648
8	Hopkins Street between Route 28 and South Street	3,512	2,107	913,095	221,250	0.76	0.76	694,919	97.9	68,032,554	218,176	88.11	19,223,522	168,384	97.9	16,484,811	52,866	88.11	4,658,007
9	Hopkins Street between South Street and North Avenue	3,512	2,107	913,095	221,250	0.76	0.76	694,919	97.9	68,032,554	218,176	88.11	19,223,522	168,384	97.9	16,484,811	52,866	88.11	4,658,007
10	South Street between eastern end and Hopkins Street	4,002	2,401	1,040,563	252,137	0.76	0.76	791,930	88.8	70,283,744	248,634	79.88	19,859,627	191,891	88.8	17,030,292	60,246	79.88	4,812,140
11	South Street between Hopkins Street and Route 28	4,002	2,401	1,040,563	252,137	0.76	0.76	791,930	88.8	70,283,744	248,634	79.88	19,859,627	191,891	88.8	17,030,292	60,246	79.88	4,812,140
12	South Street between Route 28 and Walnut Street	11,634	6,981	3,024,902	732,957	0.76	0.76	2,302,127	1.9	4,258,935	722,775	1.67	1,203,420	557,823	1.9	1,031,973	175,134	1.67	291,598
13	South Street between Walnut Street and Washington Street	5,403	3,242	1,404,706	340,371	0.76	0.76	1,069,063	77.8	83,119,659	335,643	69.98	23,486,589	259,042	77.8	20,140,533	81,329	69.98	5,690,981
14	Jocob Way between South Street and southern end	5,939	3,564	1,544,227	374,178	0.76	0.76	1,175,247	7.4	8,638,064	368,980	6.62	2,440,802	284,771	7.4	2,093,069	89,407	6.62	591,425
15	Washington Street between Mishawum Road and South Street	25,238	15,143	6,561,868	1,589,991	0.76	0.76	4,993,965	21.6	107,869,639	1,567,903	19.44	30,480,032	1,210,076	21.6	26,137,643	379,915	19.44	7,385,546
16	West Street between South Street and Woburn Street	21,352	12,811	5,551,619	1,345,200	0.76	0.76	4,225,107	21.6	91,262,301	1,326,513	19.44	25,787,403	1,023,776	21.6	22,113,558	321,424	19.44	6,248,486
17	Archestone Circle west of West Street	1,545	927	401,762	97,350	0.76	0.76	305,764	41.1	12,566,912	95,998	36.99	3,550,952	74,089	41.1	3,045,060	23,261	36.99	860,423
18	North Street between William Street and Route 28	10,044	6,026	401,762	97,350	0.76	0.76	305,764	73.9	22,580,693	95,998	66.47	6,380,481	74,089	73.9	5,471,476	23,261	66.47	1,546,040
19	North Street between Route 28 and Hopkins Street	14,258	8,555	401,762	97,350	0.76	0.76	305,764	73.9	22,580,693	95,998	66.47	6,380,481	74,089	73.9	5,471,476	23,261	66.47	1,546,040
20	Route 28 between North Street and Elm Street	31,326	18,794	401,762	97,350	0.76	0.76	305,764	49.2	15,028,315	95,998	44.24	4,246,455	74,089	49.2	3,641,476	23,261	44.24	1,028,949
								Freeway	0				0		Freeway	0				0
								Arterial	971,706,473				274,568,864		Arterial	235,451,953				66,530,148

Weekday Idle Emission Parameters

	Pollutant	Peak Period Emissions (g/sec)	Peak Period Emissions (g/year)	Peak Period Emissions (tons/year)	Off-Peak Period Emissions (g/sec)	Off-Peak Period Emissions (g/year)	Off-Peak Period Emissions (tons/year)
Freeway	CO2	0.3872	0	0.00	0.3872	0	0.00
Arterial	CO2	0.3872	376,219,104	414.71	0.3872	106,305,819	117.18
Total				414.54			117.14

Weekend Idle Emission Parameters

Pollutant	Peak Period Emissions (g/sec)	Peak Period Emissions (g/year)	Peak Period Emissions (tons/year)	Off-Peak Period Emissions (g/sec)	Off-Peak Period Emissions (g/year)	Off-Peak Period Emissions (tons/year)
CO2	0.3872	0	0.00	0.3872	0	0.00
CO2	0.3872	91,160,783	100.49	0.3872	25,758,718	28.39
			100.45			28.38

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

2012 Build Alternative

Link No.	Description	Roadway Link Length type	(miles)	Annual Weekday Peak VMT (veh-miles)	Weekday Peak Traffic Data: Wkdy Speed Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Annual Weekday Off-Peak VMT (veh-miles)	Weekday Off-Peak Traffic Data: Speed Off-Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Annual Weekend Peak (veh-miles)	Weekend Peak Traffic Data: Wkdy Speed Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Annual Weekend Off-Peak (veh-miles)	Weekend Off-Peak Traffic Data: Speed Off-Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)
1	Route 28 between Parker Road and Summer Avenue	2	0.65	3,640,954	30	557.53	2029940.84	1,143,112	40	557.53	637319.29	882,231	30	557.53	491870.28	276,985	40	557.53	154427.37
2	Route 28 between Summer Avenue and Hopkins Street	2	0.23	1,258,593	30	557.53	701703.23	395,147	40	557.53	220306.42	304,967	30	557.53	170028.09	95,747	40	557.53	53381.94
3	Route 28 between Hopkins Street and South Street	2	0.12	707,554	30	557.53	394482.43	222,143	40	557.53	123851.52	171,446	30	557.53	95586.13	53,827	40	557.53	30010.18
4	Route 28 between South Street and Elm Street	2	1.32	8,829,773	30	557.53	4922863.35	2,772,191	40	557.53	1545579.91	2,139,522	30	557.53	1192847.66	671,723	40	557.53	374505.90
5	Summer Avenue between eastern end and Main Street	2	0.58	224,869	20	557.53	125371.45	70,600	30	557.53	39361.56	54,488	20	557.53	30378.47	17,107	30	557.53	9537.61
6	Summer Avenue between Route 28 and Woburn Street	2	0.91	622,721	20	557.53	347185.63	195,509	30	557.53	109002.24	150,890	20	557.53	84125.75	47,373	30	557.53	26412.08
7	Hopkins Street between Summer Avenue and Route 28	2	0.32	239,510	20	557.53	133534.06	75,196	30	557.53	41924.29	58,035	20	557.53	32356.33	18,221	30	557.53	10158.58
8	Hopkins Street between Route 28 and South Street	2	0.30	209,923	20	557.53	117038.59	65,907	30	557.53	36745.38	50,866	20	557.53	28359.35	15,970	30	557.53	8903.69
9	Hopkins Street between South Street and North Avenue	2	1.22	849,959	20	557.53	473877.89	266,853	30	557.53	148778.48	205,952	20	557.53	114824.26	64,661	30	557.53	36050.17
10	South Street between eastern end and Hopkins Street	2	0.10	82,222	20	557.53	45840.97	25,814	30	557.53	14392.21	19,923	20	557.53	11107.62	6,255	30	557.53	3487.34
11	South Street between Hopkins Street and Route 28	2	0.23	183,348	20	557.53	102222.02	57,564	30	557.53	32093.58	44,427	20	557.53	24769.18	13,948	30	557.53	7776.52
12	South Street between Route 28 and Walnut Street	2	0.54	1,253,191	20	557.53	698691.78	393,451	30	557.53	219360.95	303,658	20	557.53	169298.39	95,336	30	557.53	53152.85
13	South Street between Walnut Street and Washington Street	2	0.67	718,720	20	557.53	400707.86	225,649	30	557.53	125806.05	174,151	20	557.53	97094.60	54,676	30	557.53	30483.77
14	Jacob Way between South Street and southern end	2	0.35	418,399	20	557.53	233270.02	131,360	30	557.53	73237.35	101,381	20	557.53	56523.12	31,830	30	557.53	17745.97
15	Washington Street between Mishawum Road and South Street	2	0.40	1,984,467	20	557.53	1106399.94	623,042	30	557.53	347364.81	480,852	20	557.53	268089.22	150,968	30	557.53	84169.17
16	West Street between South Street and Woburn Street	2	0.60	2,526,262	20	557.53	1408466.64	793,144	30	557.53	442201.54	612,133	20	557.53	341282.30	192,185	30	557.53	107148.83
17	Archestone Circle west of West Street	2	0.49	149,408	20	557.53	83299.19	46,908	30	557.53	26152.58	36,203	20	557.53	20184.03	11,366	30	557.53	6336.97
18	North Street between William Street and Route 28	2	1.21	369,975	20	557.53	206272.04	116,157	30	557.53	64761.08	89,648	20	557.53	49981.30	28,146	30	557.53	15692.11
19	North Street between Route 28 and Hopkins Street	2	0.49	149,825	20	557.53	83531.65	47,039	30	557.53	26225.56	36,304	20	557.53	20240.36	11,398	30	557.53	6354.65
20	Route 28 between North Street and Elm Street	2	0.43	131,479	30	557.53	73303.29	41,279	40	557.53	23014.27	31,858	30	557.53	17761.95	10,002	40	557.53	5576.53

Mesoscale CO2 Emissions (tons/year)

24671.8

Weekday CO2 Emission Inventory

VMT Emissions (tons/year)	Peak	Off-Peak
VMT = 31,403,465	14688.2	4611.5
Idle Emissions (tons/year)	**Peak**	**Off-Peak**
	436.61	123.4
	TOTAL	19859.7

Weekend CO2 Emission Inventory

VMT Emissions (tons/year)	Peak	Off-Peak
VMT = 7,609,301	3559.1	1117.4
Idle Emissions (tons/year)	**Peak**	**Off-Peak**
	105.79	29.9
	TOTAL	4812.1

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

2012 Build Alternative

Link No.	Description	Seasonally Adjusted Wkdy ADT (veh/day)	Seasonally Adjusted Wknd ADT (veh/day)	Annual Weekday Trips (veh/day)	Annual Weekend Trips (veh/day)	Wkdy Peak Period Factor	Wknd Peak Period Factor	Weekday Peak Traffic Data: Period Volume (vehicles)	Weekday Peak Traffic Data: Delay (sec)	Weekday Peak Traffic Data: Adjusted Delay (veh-sec)	Weekday Off-Peak Traffic Data: Period Volume (vehicles)	Weekday Off-Peak Traffic Data: Delay (sec)	Weekday Off-Peak Traffic Data: Adjusted Delay (veh-sec)	Weekend Peak Traffic Data: Period Volume (vehicles)	Weekend Peak Traffic Data: Delay (sec)	Weekend Peak Traffic Data: Adjusted Delay (veh-sec)	WeekendOff-Peak Traffic Data: Period Volume (vehicles)	WeekendOff-Peak Traffic Data: Delay (sec)	WeekendOff-Peak Traffic Data: Adjusted Delay (veh-sec)
1	Route 28 between Parker Road and Summer Avenue	28,095	16,857	7,304,762	1,770,000	0.76	0.76	5,559,351	6.2	34,190,007	1,745,411	5.54	9,660,851	1,347,073	6.2	8,284,502	422,927	5.54	2,340,898
2	Route 28 between Summer Avenue and Hopkins Street	27,393	16,436	7,122,143	1,725,750	0.76	0.76	5,420,367	3.5	18,971,284	1,701,776	3.15	5,360,594	1,313,397	3.5	4,596,888	412,353	3.15	1,298,913
3	Route 28 between Hopkins Street and South Street	29,500	17,700	7,670,000	1,858,500	0.76	0.76	5,837,318	4.4	25,392,334	1,832,682	3.92	7,174,949	1,414,427	4.4	6,152,758	444,073	3.92	1,738,545
4	Route 28 between South Street and Elm Street	33,925	20,355	8,820,500	2,137,275	0.76	0.76	6,712,916	33.7	225,889,623	2,107,584	30.29	63,828,182	1,626,591	33.7	54,734,793	510,684	30.29	15,466,059
5	Summer Avenue between eastern end and Main Street	1,967	1,180	511,333	123,900	0.76	0.76	389,155	19.7	7,666,345	122,179	17.73	2,166,230	94,295	19.7	1,857,614	29,605	17.73	524,894
6	Summer Avenue between Route 28 and Woburn Street	3,442	2,065	894,833	216,825	0.76	0.76	681,020	19.7	13,416,103	213,813	17.73	3,790,902	165,016	19.7	3,250,825	51,809	17.73	918,565
7	Hopkins Street between Summer Avenue and Route 28	3,793	2,276	986,143	238,950	0.76	0.76	750,512	97.9	73,475,159	235,631	88.11	20,761,404	181,855	97.9	17,803,596	57,095	88.11	5,030,648
8	Hopkins Street between Route 28 and South Street	3,512	2,107	913,095	221,250	0.76	0.76	694,919	97.9	68,032,554	218,176	88.11	19,223,522	168,384	97.9	16,484,811	52,866	88.11	4,658,007
9	Hopkins Street between South Street and North Avenue	3,512	2,107	913,095	221,250	0.76	0.76	694,919	97.9	68,032,554	218,176	88.11	19,223,522	168,384	97.9	16,484,811	52,866	88.11	4,658,007
10	South Street between eastern end and Hopkins Street	4,004	2,402	1,040,929	252,225	0.76	0.76	792,207	71.7	56,761,666	248,721	64.49	16,038,780	191,958	71.7	13,753,788	60,267	64.49	3,886,320
11	South Street between Hopkins Street and Route 28	4,004	2,402	1,040,929	252,225	0.76	0.76	792,207	71.7	56,761,666	248,721	64.49	16,038,780	191,958	71.7	13,753,788	60,267	64.49	3,886,320
12	South Street between Route 28 and Walnut Street	11,660	6,996	3,031,476	734,550	0.76	0.76	2,307,131	1.9	4,268,192	724,346	1.67	1,206,035	559,035	1.9	1,034,216	175,515	1.67	292,232
13	South Street between Walnut Street and Washington Street	5,408	3,245	1,406,167	340,725	0.76	0.76	1,070,175	83.8	89,680,666	335,992	75.42	25,340,490	259,312	83.8	21,730,315	81,413	75.42	6,140,196
14	Jocob Way between South Street and southern end	5,970	3,582	1,552,262	376,125	0.76	0.76	1,181,362	7.4	8,683,011	370,900	6.62	2,453,503	286,253	7.4	2,103,960	89,872	6.62	594,503
15	Washington Street between Mishawum Road and South Street	25,215	15,129	6,556,024	1,588,575	0.76	0.76	4,989,517	21.6	107,773,573	1,566,507	19.44	30,452,887	1,208,998	21.6	26,114,366	379,577	19.44	7,378,969
16	West Street between South Street and Woburn Street	21,352	12,811	5,551,619	1,345,200	0.76	0.76	4,225,107	21.6	91,262,301	1,326,513	19.44	25,787,403	1,023,776	21.6	22,113,558	321,424	19.44	6,248,486
17	Archestone Circle west of West Street	1,545	927	401,762	97,350	0.76	0.76	305,764	41.1	12,566,912	95,998	36.99	3,550,952	74,089	41.1	3,045,060	23,261	36.99	860,423
18	North Street between William Street and Route 28	10,044	6,026	401,762	97,350	0.76	0.76	305,764	73.9	22,580,693	95,998	66.47	6,380,481	74,089	73.9	5,471,476	23,261	66.47	1,546,040
19	North Street between Route 28 and Hopkins Street	14,258	8,555	401,762	97,350	0.76	0.76	305,764	73.9	22,580,693	95,998	66.47	6,380,481	74,089	73.9	5,471,476	23,261	66.47	1,546,040
20	Route 28 between North Street and Elm Street	31,326	18,796	401,762	97,350	0.76	0.76	305,764	49.2	15,028,315	95,998	44.24	4,246,455	74,089	49.2	3,641,476	23,261	44.24	1,028,949
									Freeway	0			0		Freeway	0			0
									Arterial	1,023,013,651			289,066,404		Arterial	247,884,077			70,043,013

	Pollutant	Weekday Idle Emission Parameters: Peak Period Emissions (g/sec)	(g/year)	(tons/year)	Weekday Idle Emission Parameters: Off-Peak Period Emissions (g/sec)	(g/year)	(tons/year)	Weekend Idle Emission Parameters: Peak Period Emissions (g/sec)	(g/year)	(tons/year)	Weekend Idle Emission Parameters: Off-Peak Period Emissions (g/sec)	(g/year)	(tons/year)
Freeway	CO2	0.3872	0	0.00	0.3872	0	0.00	0.3872	0	0.00	0.3872	0	0.00
Arterial	CO2	0.3872	396,083,890	436.61	0.3872	111,918,884	123.37	0.3872	95,974,173	105.79	0.3872	27,118,806	29.89
Total				436.61			123.37			105.79			29.89

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

2012 No Build Alternative

Link No.	Description	Roadway Link Length type	(miles)	Annual Weekday Peak VMT (veh-miles)	Weekday Peak Traffic Data Wkdy Speed Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Annual Weekday Off-Peak VMT (veh-miles)	Weekday Off-Peak Traffic Data Speed Off-Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Annual Weekend Peak VMT (veh-miles)	Weekend Peak Traffic Data Wkdy Speed Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Annual Weekend Off-Peak VMT (veh-miles)	Weekend Off-Peak Traffic Data Speed Off-Peak (mph)	E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)
1	Route 28 between Parker Road and Summer Avenue	2	0.65	3,622,749	30	557.53	2019791.13	1,137,397	40	557.53	634132.69	877,820	30	557.53	489410.93	275,600	40	557.53	153655.23
2	Route 28 between Summer Avenue and Hopkins Street	2	0.23	1,252,138	30	557.53	698104.75	393,121	40	557.53	219176.65	303,403	30	557.53	169156.15	95,256	40	557.53	53108.19
3	Route 28 between Hopkins Street and South Street	2	0.12	702,500	30	557.53	391664.70	220,557	40	557.53	122966.87	170,221	30	557.53	94903.37	53,443	40	557.53	29795.82
4	Route 28 between South Street and Elm Street	2	1.32	8,555,556	30	557.53	4769979.40	2,686,099	40	557.53	1497580.53	2,073,077	30	557.53	1155802.70	650,862	40	557.53	362875.28
5	Summer Avenue between eastern end and Main Street	2	0.58	224,869	20	557.53	125371.45	70,600	30	557.53	39361.56	54,488	20	557.53	30378.47	17,107	30	557.53	9537.61
6	Summer Avenue between Route 28 and Woburn Street	2	0.91	622,721	20	557.53	347185.63	195,509	30	557.53	109002.24	150,890	20	557.53	84125.75	47,373	30	557.53	26412.08
7	Hopkins Street between Summer Avenue and Route 28	2	0.32	239,510	20	557.53	133534.06	75,196	30	557.53	41924.29	58,035	20	557.53	32356.33	18,221	30	557.53	10158.58
8	Hopkins Street between Route 28 and South Street	2	0.30	209,923	20	557.53	117038.59	65,907	30	557.53	36745.38	50,866	20	557.53	28359.35	15,970	30	557.53	8903.69
9	Hopkins Street between South Street and North Avenue	2	1.22	849,959	20	557.53	473877.89	266,853	30	557.53	148778.48	205,952	20	557.53	114824.26	64,661	30	557.53	36050.17
10	South Street between eastern end and Hopkins Street	2	0.10	80,779	20	557.53	45036.74	25,361	30	557.53	14139.72	19,573	20	557.53	10912.75	6,145	30	557.53	3426.16
11	South Street between Hopkins Street and Route 28	2	0.23	180,131	20	557.53	100428.65	56,554	30	557.53	31530.53	43,647	20	557.53	24334.63	13,703	30	557.53	7640.09
12	South Street between Route 28 and Walnut Street	2	0.54	1,117,303	20	557.53	622930.02	350,788	30	557.53	195574.82	270,731	20	557.53	150940.74	84,999	30	557.53	47389.28
13	South Street between Walnut Street and Washington Street	2	0.67	681,384	20	557.53	379891.86	213,927	30	557.53	119270.67	165,105	20	557.53	92050.72	51,836	30	557.53	28900.20
14	Jacob Way between South Street and southern end	2	0.35	310,108	20	557.53	172894.25	97,361	30	557.53	54281.80	75,141	20	557.53	41893.61	23,591	30	557.53	13152.90
15	Washington Street between Mishawum Road and South Street	2	0.40	2,072,911	20	557.53	1155710.24	650,810	30	557.53	362846.25	502,282	20	557.53	280037.48	157,696	30	557.53	87920.44
16	West Street between South Street and Woburn Street	2	0.60	2,526,262	20	557.53	1408466.64	793,144	30	557.53	442201.54	612,133	20	557.53	341282.30	192,185	30	557.53	107148.83
17	Archestone Circle west of West Street	2	0.49	149,408	20	557.53	83299.19	46,908	30	557.53	26152.58	36,203	20	557.53	20184.03	11,366	30	557.53	6336.97
18	North Street between William Street and Route 28	2	1.21	369,975	20	557.53	206272.04	116,157	30	557.53	64761.08	89,648	20	557.53	49981.30	28,146	30	557.53	15692.11
19	North Street between Route 28 and Hopkins Street	2	0.49	149,825	20	557.53	83531.65	47,039	30	557.53	26225.56	36,304	20	557.53	20240.36	11,398	30	557.53	6354.65
20	Route 28 between North Street and Elm Street	2	0.43	131,479	30	557.53	73303.29	41,279	40	557.53	23014.27	31,858	30	557.53	17761.95	10,002	40	557.53	5576.53

Mesoscale CO2 Emissions (tons/year)

24047.8

Weekday CO2 Emission Inventory

VMT Emissions (tons/year)	Peak	Off-Peak
VMT = 30,744,304	14379.9	4514.7

Idle Emissions (tons/year)	Peak	Off-Peak
	360.81	102.0
	TOTAL	19357.3

Weekend CO2 Emission Inventory

VMT Emissions (tons/year)	Peak	Off-Peak
VMT = 7,449,581	3484.4	1093.9

Idle Emissions (tons/year)	Peak	Off-Peak
	87.43	24.7
	TOTAL	4690.4

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

2012 No Build Alternative

Link No.	Description	Seasonally Adjusted Wkdy ADT (veh/day)	Seasonally Adjusted Wknd ADT (veh/day)	Annual Weekday Trips (veh/day)	Annual Weekend Trips (veh/day)	Wkdy Peak Period Factor	Wknd Peak Period Factor	Weekday Peak Traffic Data: Period Volume (vehicles)	Weekday Peak Traffic Data: Delay (sec)	Weekday Peak Traffic Data: Adjusted Delay (veh-sec)	Weekday Off-Peak Traffic Data: Period Volume (vehicles)	Weekday Off-Peak Traffic Data: Delay (sec)	Weekday Off-Peak Traffic Data: Adjusted Delay (veh-sec)	Weekend Peak Traffic Data: Period Volume (vehicles)	Weekend Peak Traffic Data: Delay (sec)	Weekend Peak Traffic Data: Adjusted Delay (veh-sec)	Weekend Off-Peak Traffic Data: Period Volume (vehicles)	Weekend Off-Peak Traffic Data: Delay (sec)	Weekend Off-Peak Traffic Data: Adjusted Delay (veh-sec)
1	Route 28 between Parker Road and Summer Avenue	27,955	16,773	7,268,238	1,761,150	0.76	0.76	5,531,554	6.2	34,019,057	1,736,684	5.54	9,612,547	1,340,338	6.2	8,243,079	420,812	5.54	2,329,194
2	Route 28 between Summer Avenue and Hopkins Street	27,252	16,351	7,085,619	1,716,900	0.76	0.76	5,392,570	3.5	18,873,996	1,693,049	3.15	5,333,104	1,306,661	3.5	4,573,314	410,239	3.15	1,292,252
3	Route 28 between Hopkins Street and South Street	29,289	17,574	7,615,214	1,845,225	0.76	0.76	5,795,623	4.4	25,500,742	1,819,591	3.96	7,205,581	1,404,324	4.4	6,179,026	440,901	3.96	1,745,968
4	Route 28 between South Street and Elm Street	32,871	19,723	8,546,571	2,070,900	0.76	0.76	6,504,440	14.2	92,037,831	2,042,131	12.74	26,006,539	1,576,076	14.2	22,301,474	494,824	12.74	6,301,585
5	Summer Avenue between eastern end and Main Street	1,967	1,180	511,333	123,900	0.76	0.76	389,155	19.7	7,666,345	122,179	17.73	2,166,230	94,295	19.7	1,857,614	29,605	17.73	524,894
6	Summer Avenue between Route 28 and Woburn Street	3,442	2,065	894,833	216,825	0.76	0.76	681,020	19.7	13,416,103	213,813	17.73	3,790,902	165,016	19.7	3,250,825	51,809	17.73	918,565
7	Hopkins Street between Summer Avenue and Route 28	3,793	2,276	986,143	238,950	0.76	0.76	750,512	96.8	72,612,070	235,631	87.08	20,517,527	181,855	96.8	17,594,463	57,095	87.08	4,971,555
8	Hopkins Street between Route 28 and South Street	3,512	2,107	913,095	221,250	0.76	0.76	694,919	96.8	67,233,398	218,176	87.08	18,997,710	168,384	96.8	16,291,169	52,866	87.08	4,603,291
9	Hopkins Street between South Street and North Avenue	3,512	2,107	913,095	221,250	0.76	0.76	694,919	96.8	67,233,398	218,176	87.08	18,997,710	168,384	96.8	16,291,169	52,866	87.08	4,603,291
10	South Street between eastern end and Hopkins Street	3,933	2,360	1,022,667	247,800	0.76	0.76	778,309	70.3	54,676,214	244,358	63.23	15,449,507	188,590	70.3	13,248,467	59,210	63.23	3,743,534
11	South Street between Hopkins Street and Route 28	3,933	2,360	1,022,667	247,800	0.76	0.76	778,309	70.3	54,676,214	244,358	63.23	15,449,507	188,590	70.3	13,248,467	59,210	63.23	3,743,534
12	South Street between Route 28 and Walnut Street	10,395	6,237	2,702,762	654,900	0.76	0.76	2,056,960	0.0	0	645,802	0.00	0	498,417	0.0	0	156,483	0.00	0
13	South Street between Walnut Street and Washington Street	5,127	3,076	1,333,119	323,025	0.76	0.76	1,014,582	82.5	83,652,245	318,538	74.21	23,637,078	245,841	82.5	20,269,582	77,184	74.21	5,727,446
14	Jocob Way between South Street and southern end	4,425	2,655	1,150,500	278,775	0.76	0.76	875,598	0.0	0	274,902	0.00	0	212,164	0.0	0	66,611	0.00	0
15	Washington Street between Mishawum Road and South Street	26,339	15,804	6,848,214	1,659,375	0.76	0.76	5,211,891	19.2	100,068,313	1,636,323	17.28	28,275,661	1,262,881	19.2	24,247,322	396,494	17.28	6,851,410
16	West Street between South Street and Woburn Street	21,352	12,811	5,551,619	1,345,200	0.76	0.76	4,225,107	19.2	81,122,046	1,326,513	17.28	22,922,136	1,023,776	19.2	19,656,496	321,424	17.28	5,554,210
17	Archestone Circle west of West Street	1,545	927	401,762	97,350	0.76	0.76	305,764	40.9	12,490,471	95,998	36.77	3,529,352	74,089	40.9	3,026,537	23,261	36.77	855,189
18	North Street between William Street and Route 28	10,044	6,026	401,762	97,350	0.76	0.76	305,764	73.9	22,580,693	95,998	66.47	6,380,481	74,089	73.9	5,471,476	23,261	66.47	1,546,040
19	North Street between Route 28 and Hopkins Street	14,258	8,555	401,762	97,350	0.76	0.76	305,764	73.9	22,580,693	95,998	66.47	6,380,481	74,089	73.9	5,471,476	23,261	66.47	1,546,040
20	Route 28 between North Street and Elm Street	31,186	18,711	401,762	97,350	0.76	0.76	305,764	49.0	14,967,162	95,998	44.06	4,229,175	74,089	49.0	3,626,658	23,261	44.06	1,024,762
									Freeway	0			0		Freeway	0			0
									Arterial	845,406,989			238,881,229		Arterial	204,848,617			57,882,759

Weekday Idle Emission Parameters

Pollutant	Peak Period Emissions (g/sec)	Peak Period Emissions (g/year)	Peak Period Emissions (tons/year)	Off-Peak Period Emissions (g/sec)	Off-Peak Period Emissions (g/year)	Off-Peak Period Emissions (tons/year)
CO2	0.3872	0	0.00	0.3872	0	0.00
CO2	0.3872	327,319,277	360.81	0.3872	92,488,508	101.95
Total			360.81			101.95

Weekend Idle Emission Parameters

Pollutant	Peak Period Emissions (g/sec)	Peak Period Emissions (g/year)	Peak Period Emissions (tons/year)	Off-Peak Period Emissions (g/sec)	Off-Peak Period Emissions (g/year)	Off-Peak Period Emissions (tons/year)
CO2	0.3872	0	0.00	0.3872	0	0.00
CO2	0.3872	79,311,979	87.43	0.3872	22,410,677	24.70
Total			87.43			24.70

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Weekday

Link No.	Roadway Description	2007 Existing Condition: Roadway S.A.F.	Roadway ADT (veh/day)	Seasonal ADT (veh/day)	2012 No Build Alternative: Roadway ADT (veh/day)	Seasonal ADT (veh/day)	Traffic Increase (existing)	2012 Build Alternative: Roadway ADT (veh/day)	Seasonal ADT (veh/day)	Traffic Increase (existing)	Traffic Increase (no-build)	2012 Build Alternative With Mitigation: Roadway ADT (veh/day)	Seasonal ADT (veh/day)	Traffic Increase (existing)	Traffic Increase (no-build)
1	Route 28 between Parker Road and Summer Avenue	100%	23,389	23,389	27,955	27,955	19.5%	28,095	28,095	20.1%	0.5%	28,092	28,092	20.1%	0.5%
2	Route 28 between Summer Avenue and Hopkins Street	100%	22,898	22,898	27,252	27,252	19.0%	27,393	27,393	19.6%	0.5%	27,390	27,390	19.6%	0.5%
3	Route 28 between Hopkins Street and South Street	100%	24,794	24,794	29,289	29,289	18.1%	29,500	29,500	19.0%	0.7%	29,496	29,496	19.0%	0.7%
4	Route 28 between South Street and Elm Street	100%	26,690	26,690	32,871	32,871	23.2%	33,925	33,925	27.1%	3.2%	33,904	33,904	27.0%	3.1%
5	Summer Avenue between eastern end and Main Street	100%	1,967	1,967	1,967	1,967	0.0%	1,967	1,967	0.0%	0.0%	1,967	1,967	0.0%	0.0%
6	Summer Avenue between Route 28 and Woburn Street	100%	3,231	3,231	3,442	3,442	6.5%	3,442	3,442	6.5%	0.0%	3,442	3,442	6.5%	0.0%
7	Hopkins Street between Summer Avenue and Route 28	100%	3,301	3,301	3,793	3,793	14.9%	3,793	3,793	14.9%	0.0%	3,793	3,793	14.9%	0.0%
8	Hopkins Street between Route 28 and South Street	100%	3,020	3,020	3,512	3,512	16.3%	3,512	3,512	16.3%	0.0%	3,512	3,512	16.3%	0.0%
9	Hopkins Street between South Street and North Avenue	100%	3,020	3,020	3,512	3,512	16.3%	3,512	3,512	16.3%	0.0%	3,512	3,512	16.3%	0.0%
10	South Street between eastern end and Hopkins Street	100%	3,231	3,231	3,933	3,933	21.7%	4,004	4,004	23.9%	1.8%	4,002	4,002	23.9%	1.7%
11	South Street between Hopkins Street and Route 28	100%	3,231	3,231	3,933	3,933	21.7%	4,004	4,004	23.9%	1.8%	4,002	4,002	23.9%	1.7%
12	South Street between Route 28 and Walnut Street	100%	5,830	5,830	10,395	10,395	78.3%	11,660	11,660	100.0%	12.2%	11,634	11,634	99.6%	11.9%
13	South Street between Walnut Street and Washington Street	100%	4,355	4,355	5,127	5,127	17.7%	5,408	5,408	24.2%	5.5%	5,403	5,403	24.1%	5.4%
14	Jocob Way between South Street and southern end	100%	70	70	4,425	4,425	6200.0%	5,970	5,970	8400.0%	34.9%	5,939	5,939	8356.0%	34.2%
15	Washington Street between Mishawum Road and South Street	100%	23,811	23,811	26,339	26,339	10.6%	25,215	25,215	5.9%	-4.3%	25,238	25,238	6.0%	-4.2%
16	West Street between South Street and Woburn Street	100%	20,229	20,229	21,352	21,352	5.6%	21,352	21,352	5.6%	0.0%	21,352	21,352	5.6%	0.0%
17	Archestone Circle west of West Street	100%	702	702	1,545	1,545	120.0%	1,545	1,545	120.0%	0.0%	1,545	1,545	120.0%	0.0%
18	North Street between William Street and Route 28	100%	9,904	9,904	10,044	10,044	1.4%	10,044	10,044	1.4%	0.0%	10,044	10,044	1.4%	0.0%
19	North Street between Route 28 and Hopkins Street	100%	13,486	13,486	14,258	14,258	5.7%	14,258	14,258	5.7%	0.0%	14,258	14,258	5.7%	0.0%
20	Route 28 between North Street and Elm Street	100%	28,868	28,868	31,186	31,186	8.0%	31,326	31,326	8.5%	0.5%	31,326	31,326	8.5%	0.5%

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

ATR Monitoring Data Recorded on Audubon Road north of Sheraton Site Driveway - November 16, 2006

Saturday 11/18/2006

Begin Time	Volume	V/C Ratio	Peak Period Data Hours	Peak Period Data Volume
12:00 AM	70	0.04	0	0
1:00 AM	38	0.02	0	0
2:00 AM	22	0.01	0	0
3:00 AM	16	0.01	0	0
4:00 AM	56	0.03	0	0
5:00 AM	230	0.13	0	0
6:00 AM	923	0.51	0	0
7:00 AM	1,664	0.92	1	1,664
8:00 AM	1,573	0.87	1	1,573
9:00 AM	1,218	0.68	0	0
10:00 AM	1,289	0.72	1	1,289
11:00 AM	1,473	0.82	1	1,473
12:00 PM	1,576	0.88	1	1,576
1:00 PM	1,450	0.81	1	1,450
2:00 PM	1,546	0.86	1	1,546
3:00 PM	1,570	0.87	1	1,570
4:00 PM	1,525	0.85	1	1,525
5:00 PM	1,620	0.90	1	1,620
6:00 PM	1,373	0.76	1	1,373
7:00 PM	905	0.50	0	0
8:00 PM	674	0.37	0	0
9:00 PM	469	0.26	0	0
10:00 PM	286	0.16	0	0
11:00 PM	148	0.08	0	0
Total	**21,714**		**11**	**16,659**

Roadway Capacity	Crit. V/C	Critical Capacity
1800	70%	1260

Peak Hour (K) Factor 0.077 (4:00-5:00 PM)

Peak Period Volume Factor 0.767

Sunday 11/17/2006

Begin Time	Volume	V/C Ratio	Peak Period Data Hours	Peak Period Data Volume
12:00 AM	77	0.04	0	0
1:00 AM	45	0.03	0	0
2:00 AM	20	0.01	0	0
3:00 AM	21	0.01	0	0
4:00 AM	49	0.03	0	0
5:00 AM	230	0.13	0	0
6:00 AM	877	0.49	0	0
7:00 AM	1,601	0.89	1	1,601
8:00 AM	1,555	0.86	1	1,555
9:00 AM	1,284	0.71	1	1,284
10:00 AM	1,247	0.69	0	0
11:00 AM	1,373	0.76	1	1,373
12:00 PM	1,514	0.84	1	1,514
1:00 PM	1,343	0.75	1	1,343
2:00 PM	1,460	0.81	1	1,460
3:00 PM	1,537	0.85	1	1,537
4:00 PM	1,533	0.85	1	1,533
5:00 PM	1,589	0.88	1	1,589
6:00 PM	1,262	0.70	1	1,262
7:00 PM	965	0.54	0	0
8:00 PM	651	0.36	0	0
9:00 PM	526	0.29	0	0
10:00 PM	297	0.17	0	0
11:00 PM	161	0.09	0	0
Total	**21,217**		**11**	**16,051**

Roadway Capacity	Crit. V/C	Critical Capacity
1800	70%	1260

Peak Hour (K) Factor 0.075 (4:00-5:00 PM)

Peak Period Volume Factor 0.757

Weekend Average

Begin Time	Total Volume	V/C Ratio	Peak Period Data Hours	Peak Period Data Volume
12:00 AM	74	0.04	0	0
1:00 AM	42	0.02	0	0
2:00 AM	21	0.01	0	0
3:00 AM	19	0.01	0	0
4:00 AM	53	0.03	0	0
5:00 AM	230	0.13	0	0
6:00 AM	900	0.50	0	0
7:00 AM	1,633	0.91	1	1,633
8:00 AM	1,564	0.87	1	1,564
9:00 AM	1,251	0.70	0	0
10:00 AM	1,268	0.70	1	1,268
11:00 AM	1,423	0.79	1	1,423
12:00 PM	1,545	0.86	1	1,545
1:00 PM	1,397	0.78	1	1,397
2:00 PM	1,503	0.84	1	1,503
3:00 PM	1,554	0.86	1	1,554
4:00 PM	1,529	0.85	1	1,529
5:00 PM	1,605	0.89	1	1,605
6:00 PM	1,318	0.73	1	1,318
7:00 PM	935	0.52	0	0
8:00 PM	663	0.37	0	0
9:00 PM	498	0.28	0	0
10:00 PM	292	0.16	0	0
11:00 PM	155	0.09	0	0
Total	**21,466**		**11**	**16,337**

Roadway Capacity	Crit. V/C	Critical Capacity
1800	70%	1260

Peak Hour (K) Factor 0.076 (4:00-5:00 PM)

Peak Period Volume Factor 0.761

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

ATR Monitoring Data Recorded on Audubon Road north of Sheraton Site Driveway - November 16, 2006

Tuesday 01/09/2007

Begin Time	Volume	V/C Ratio	Peak Period Data Hours	Peak Period Data Volume
12:00 AM	70	0.04	0	0
1:00 AM	38	0.02	0	0
2:00 AM	22	0.01	0	0
3:00 AM	16	0.01	0	0
4:00 AM	56	0.03	0	0
5:00 AM	230	0.13	0	0
6:00 AM	923	0.51	0	0
7:00 AM	1,664	0.92	1	1,664
8:00 AM	1,573	0.87	1	1,573
9:00 AM	1,218	0.68	0	0
10:00 AM	1,289	0.72	1	1,289
11:00 AM	1,473	0.82	1	1,473
12:00 PM	1,576	0.88	1	1,576
1:00 PM	1,450	0.81	1	1,450
2:00 PM	1,546	0.86	1	1,546
3:00 PM	1,570	0.87	1	1,570
4:00 PM	1,525	0.85	1	1,525
5:00 PM	1,620	0.90	1	1,620
6:00 PM	1,373	0.76	1	1,373
7:00 PM	905	0.50	0	0
8:00 PM	674	0.37	0	0
9:00 PM	469	0.26	0	0
10:00 PM	286	0.16	0	0
11:00 PM	148	0.08	0	0
Total	**21,714**		**11**	**16,659**

Roadway Capacity	Crit. V/C	Critical Capacity
1800	70%	1260

Peak Hour (K) Factor 0.077

Peak Period Volume Factor 0.767

Wednesday 01/10/2007

Begin Time	Volume	V/C Ratio	Peak Period Data Hours	Peak Period Data Volume
12:00 AM	77	0.04	0	0
1:00 AM	45	0.03	0	0
2:00 AM	20	0.01	0	0
3:00 AM	21	0.01	0	0
4:00 AM	49	0.03	0	0
5:00 AM	230	0.13	0	0
6:00 AM	877	0.49	0	0
7:00 AM	1,601	0.89	1	1,601
8:00 AM	1,555	0.86	1	1,555
9:00 AM	1,284	0.71	1	1,284
10:00 AM	1,247	0.69	0	0
11:00 AM	1,373	0.76	1	1,373
12:00 PM	1,514	0.84	1	1,514
1:00 PM	1,343	0.75	1	1,343
2:00 PM	1,460	0.81	1	1,460
3:00 PM	1,537	0.85	1	1,537
4:00 PM	1,533	0.85	1	1,533
5:00 PM	1,589	0.88	1	1,589
6:00 PM	1,262	0.70	1	1,262
7:00 PM	965	0.54	0	0
8:00 PM	651	0.36	0	0
9:00 PM	526	0.29	0	0
10:00 PM	297	0.17	0	0
11:00 PM	161	0.09	0	0
Total	**21,217**		**11**	**16,051**

Roadway Capacity	Crit. V/C	Critical Capacity
1800	70%	1260

Peak Hour (K) Factor 0.075

Peak Period Volume Factor 0.757

Weekday Average

Begin Time	Total Volume	V/C Ratio	Peak Period Data Hours	Peak Period Data Volume
12:00 AM	74	0.04	0	0
1:00 AM	42	0.02	0	0
2:00 AM	21	0.01	0	0
3:00 AM	19	0.01	0	0
4:00 AM	53	0.03	0	0
5:00 AM	230	0.13	0	0
6:00 AM	900	0.50	0	0
7:00 AM	1,633	0.91	1	1,633
8:00 AM	1,564	0.87	1	1,564
9:00 AM	1,251	0.70	0	0
10:00 AM	1,268	0.70	1	1,268
11:00 AM	1,423	0.79	1	1,423
12:00 PM	1,545	0.86	1	1,545
1:00 PM	1,397	0.78	1	1,397
2:00 PM	1,503	0.84	1	1,503
3:00 PM	1,554	0.86	1	1,554
4:00 PM	1,529	0.85	1	1,529
5:00 PM	1,605	0.89	1	1,605
6:00 PM	1,318	0.73	1	1,318
7:00 PM	935	0.52	0	0
8:00 PM	663	0.37	0	0
9:00 PM	498	0.28	0	0
10:00 PM	292	0.16	0	0
11:00 PM	155	0.09	0	0
Total	**21,466**		**11**	**16,337**

Roadway Capacity	Crit. V/C	Critical Capacity
1800	70%	1260

Peak Hour (K) Factor 0.076

Peak Period Volume Factor 0.761

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Average Daily Traffic (ADT) for Mesoscale Roadway Network

Weekend

		2007	2012	2012	2012			PM Peak hour volume			
	Roadway Segment	Existing Volume (ADT)	No Build Volume (ADT)	Build Volume (ADT)	Build w/ Mit Volume (ADT)	K Factor	SAF to adjust Avg Annual month to Nov	MHD Count Station Data	2007	2012 NB	2012 BD	2011 BD w/ Miti
						8.4%	118.0%					
1	Route 28 between Parker Road and Summer Avenue	14,034	16,773	16,857	16,855				999	1,194	1,200	1,200
2	Route 28 between Summer Avenue and Hopkins Street	13,739	16,351	16,436	16,434				978	1,164	1,170	1,170
3	Route 28 between Hopkins Street and South Street	14,876	17,574	17,700	17,697				1,059	1,251	1,260	1,260
4	Route 28 between South Street and Elm Street	16,014	19,723	20,355	20,342				1,140	1,404	1,449	1,448
5	Summer Avenue between eastern end and Main Street	1,180	1,180	1,180	1,180				84	84	84	84
6	Summer Avenue between Route 28 and Woburn Street	1,939	2,065	2,065	2,065				138	147	147	147
7	Hopkins Street between Summer Avenue and Route 28	1,981	2,276	2,276	2,276				141	162	162	162
8	Hopkins Street between Route 28 and South Street	1,812	2,107	2,107	2,107				129	150	150	150
9	Hopkins Street between South Street and North Avenue	1,812	2,107	2,107	2,107				129	150	150	150
10	South Street between eastern end and Hopkins Street	1,939	2,360	2,402	2,401				138	168	171	171
11	South Street between Hopkins Street and Route 28	1,939	2,360	2,402	2,401				138	168	171	171
12	South Street between Route 28 and Walnut Street	3,498	6,237	6,996	6,981				249	444	498	497
13	South Street between Walnut Street and Washington Street	2,613	3,076	3,245	3,242				186	219	231	231
14	Jocob Way between South Street and southern end	42	2,655	3,582	3,564				3	189	255	254
15	Washington Street between Mishawum Road and South Street	14,286	15,804	15,129	15,143				1,017	1,125	1,077	1,078
16	West Street between South Street and Woburn Street	12,137	12,811	12,811	12,811				864	912	912	912
17	Archestone Circle west of West Street	421	927	927	927				30	66	66	66
18	North Street between William Street and Route 28	5,942	6,026	6,026	6,026				423	429	429	429
19	North Street between Route 28 and Hopkins Street	8,091	8,555	8,555	8,555				576	609	609	609
20	Route 28 between North Street and Elm Street	17,321	18,711	18,796	18,794				1,233	1,332	1,338	1,338

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

2007 Existing Condition

Link No.	Description	Roadway Type	Link Length (miles)	Weekday Peak Traffic Data: Annual Weekday Peak VMT (veh-miles)	Weekday Peak Traffic Data: Wkdy Speed Peak (mph)	Weekday Peak Traffic Data: E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Weekday Off-Peak Traffic Data: Annual Weekday Off-Peak VMT (veh-miles)	Weekday Off-Peak Traffic Data: Speed Off-Peak (mph)	Weekday Off-Peak Traffic Data: E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Weekend Peak Traffic Data: Annual Weekend Peak VMT (veh-miles)	Weekend Peak Traffic Data: Wknd Speed Peak (mph)	Weekend Peak Traffic Data: E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)	Weekend Off-Peak Traffic Data: Annual Weekend Off-Peak VMT (veh-miles)	Weekend Off-Peak Traffic Data: Speed Off-Peak (mph)	Weekend Off-Peak Traffic Data: E.M.F. CO2 (g/veh-mi)	Emissions CO2 (Kg/year)
1	Route 28 between Parker Road and Summer Avenue	2	0.65	3,031,094	30	546.10	1655280.34	951,641	40	546.10	519691.05	734,457	30	546.10	401087.16	230,590	40	546.10	125925.14
2	Route 28 between Summer Avenue and Hopkins Street	2	0.23	1,052,054	30	546.10	574526.95	330,303	40	546.10	180378.22	254,921	30	546.10	139212.30	80,035	40	546.10	43707.03
3	Route 28 between Hopkins Street and South Street	2	0.12	594,682	30	546.10	324755.87	186,706	40	546.10	101960.20	144,096	30	546.10	78690.85	45,240	40	546.10	24705.74
4	Route 28 between South Street and Elm Street	2	1.32	6,946,819	30	546.10	3793658.05	2,181,020	40	546.10	1191055.13	1,683,268	30	546.10	919232.53	528,478	40	546.10	288601.82
5	Summer Avenue between eastern end and Main Street	2	0.58	224,869	20	546.10	122801.19	70,600	30	546.10	38554.60	54,488	20	546.10	29755.67	17,107	30	546.10	9342.08
6	Summer Avenue between Route 28 and Woburn Street	2	0.91	584,595	20	546.10	319247.44	183,539	30	546.10	100230.78	141,652	20	546.10	77356.11	44,473	30	546.10	24286.69
7	Hopkins Street between Summer Avenue and Route 28	2	0.32	208,462	20	546.10	113841.37	65,449	30	546.10	35741.58	50,512	20	546.10	27584.64	15,859	30	546.10	8660.46
8	Hopkins Street between Route 28 and South Street	2	0.30	180,534	20	546.10	98589.68	56,680	30	546.10	30953.17	43,745	20	546.10	23889.04	13,734	30	546.10	7500.19
9	Hopkins Street between South Street and North Avenue	2	1.22	730,965	20	546.10	399180.05	229,493	30	546.10	125326.39	177,118	20	546.10	96724.40	55,608	30	546.10	30367.55
10	South Street between eastern end and Hopkins Street	2	0.10	66,354	20	546.10	36236.04	20,833	30	546.10	11376.65	16,078	20	546.10	8780.27	5,048	30	546.10	2756.65
11	South Street between Hopkins Street and Route 28	2	0.23	147,965	20	546.10	80803.72	46,455	30	546.10	25369.10	35,853	20	546.10	19579.36	11,256	30	546.10	6147.13
12	South Street between Route 28 and Walnut Street	2	0.54	626,596	20	546.10	342183.90	196,726	30	546.10	107431.90	151,829	20	546.10	82913.79	47,668	30	546.10	26031.58
13	South Street between Walnut Street and Washington Street	2	0.67	578,709	20	546.10	316033.23	181,691	30	546.10	99221.65	140,226	20	546.10	76577.28	44,025	30	546.10	24042.17
14	Jocob Way between South Street and southern end	2	0.35	4,922	20	546.10	2688.09	1,545	30	546.10	843.95	1,193	20	546.10	651.35	374	30	546.10	204.50
15	Washington Street between Mishawum Road and South Street	2	0.40	1,873,912	20	546.10	1023343.25	588,332	30	546.10	321288.37	454,063	20	546.10	247963.94	142,557	30	546.10	77850.64
16	West Street between South Street and Woburn Street	2	0.60	2,393,300	20	546.10	1306981.39	751,400	30	546.10	410339.28	579,915	20	546.10	316691.65	182,070	30	546.10	99428.36
17	Archestone Circle west of West Street	2	0.49	67,913	20	546.10	37087.03	21,322	30	546.10	11643.83	16,456	20	546.10	8986.47	5,166	30	546.10	2821.39
18	North Street between William Street and Route 28	2	1.21	168,170	20	546.10	91837.83	52,799	30	546.10	28833.36	40,749	20	546.10	22253.01	12,794	30	546.10	6986.55
19	North Street between Route 28 and Hopkins Street	2	0.49	68,102	20	546.10	37190.53	21,381	30	546.10	11676.32	16,502	20	546.10	9011.55	5,181	30	546.10	2829.26
20	Route 28 between North Street and Elm Street	2	0.43	59,763	30	546.10	32636.59	18,763	40	546.10	10246.57	14,481	30	546.10	7908.10	4,546	40	546.10	2482.82

Mesoscale CO2 Emissions (tons/year)

19245.0

Weekday CO2 Emission Inventory

VMT Emissions (tons/year)	Peak	Off-Peak
VMT = 25,377,483	11626.3	3650.2

Idle Emissions (tons/year)	Peak	Off-Peak
	167.45	47.3
	TOTAL	15491.3

Weekend CO2 Emission Inventory

VMT Emissions (tons/year)	Peak	Off-Peak
VMT = 6,149,159	2817.2	884.5

Idle Emissions (tons/year)	Peak	Off-Peak
	40.58	11.5
	TOTAL	3753.7

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

2007 Existing Condition

Link No.	Description	Seasonally Adjusted Wkdy ADT (veh/day)	Seasonally Adjusted Wknd ADT (veh/day)	Annual Weekday Trips (veh/day)	Annual Weekend Trips (veh/day)	Wkdy Peak Period Factor	Wknd Peak Period Factor	Weekday Peak Traffic Data: Period Volume (vehicles)	Weekday Peak Traffic Data: Average Delay (sec)	Weekday Peak Traffic Data: Adjusted Delay (veh-sec)	Weekday Off-Peak Traffic Data: Period Volume (vehicles)	Weekday Off-Peak Traffic Data: Average Delay (sec)	Weekday Off-Peak Traffic Data: Adjusted Delay (veh-sec)	Weekend Peak Traffic Data: Period Volume (vehicles)	Weekend Peak Traffic Data: Average Delay (sec)	Weekend Peak Traffic Data: Adjusted Delay (veh-sec)	Weekend Off-Peak Traffic Data: Period Volume (vehicles)	Weekend Off-Peak Traffic Data: Average Delay (sec)	Weekend Off-Peak Traffic Data: Adjusted Delay (veh-sec)
1	Route 28 between Parker Road and Summer Avenue	23,389	14,034	6,081,214	1,473,525	0.76	0.76	4,628,159	5.0	22,909,389	1,453,055	4.46	6,473,359	1,121,439	5.0	5,551,121	352,086	4.46	1,568,545
2	Route 28 between Summer Avenue and Hopkins Street	22,898	13,739	5,953,381	1,442,550	0.76	0.76	4,530,871	2.7	12,233,351	1,422,510	2.43	3,456,700	1,097,865	2.7	2,964,235	344,685	2.43	837,585
3	Route 28 between Hopkins Street and South Street	24,794	14,876	6,446,452	1,562,025	0.76	0.76	4,906,127	2.7	13,001,237	1,540,325	2.39	3,673,676	1,188,792	2.7	3,150,300	373,233	2.39	890,160
4	Route 28 between South Street and Elm Street	26,690	16,014	6,939,524	1,681,500	0.76	0.76	5,281,383	6.0	31,424,230	1,658,141	5.36	8,879,343	1,279,720	6.0	7,614,333	401,780	5.36	2,151,533
5	Summer Avenue between eastern end and Main Street	1,967	1,180	511,333	123,900	0.76	0.76	389,155	18.7	7,277,190	122,179	16.83	2,056,269	94,295	18.7	1,763,319	29,605	16.83	498,250
6	Summer Avenue between Route 28 and Woburn Street	3,231	1,939	840,048	203,550	0.76	0.76	639,325	18.7	11,955,384	200,722	16.83	3,378,156	154,913	18.7	2,896,881	48,637	16.83	818,553
7	Hopkins Street between Summer Avenue and Route 28	3,301	1,981	858,310	207,975	0.76	0.76	653,224	71.9	46,934,124	205,086	64.67	13,261,874	158,281	71.9	11,372,499	49,694	64.67	3,213,454
8	Hopkins Street between Route 28 and South Street	3,020	1,812	785,262	190,275	0.76	0.76	597,630	71.9	42,939,730	187,632	64.67	12,133,204	144,810	71.9	10,404,627	45,465	64.67	2,939,969
9	Hopkins Street between South Street and North Avenue	3,020	1,812	785,262	190,275	0.76	0.76	597,630	71.9	42,939,730	187,632	64.67	12,133,204	144,810	71.9	10,404,627	45,465	64.67	2,939,969
10	South Street between eastern end and Hopkins Street	3,231	1,939	840,048	203,550	0.76	0.76	639,325	19.3	12,307,013	200,722	17.33	3,477,514	154,913	19.3	2,982,084	48,637	17.33	842,628
11	South Street between Hopkins Street and Route 28	3,231	1,939	840,048	203,550	0.76	0.76	639,325	19.3	12,307,013	200,722	17.33	3,477,514	154,913	19.3	2,982,084	48,637	17.33	842,628
12	South Street between Route 28 and Walnut Street	5,830	3,498	1,515,738	367,275	0.76	0.76	1,153,565	0.0	0	362,173	0.00	0	279,518	0.0	0	87,757	0.00	0
13	South Street between Walnut Street and Washington Street	4,355	2,613	1,132,238	274,350	0.76	0.76	861,699	35.0	30,116,393	270,539	31.46	8,509,796	208,796	35.0	7,297,434	65,554	31.46	2,061,989
14	Jacob Way between South Street and southern end	70	42	18,262	4,425	0.76	0.76	13,898	0.0	0	4,364	0.00	0	3,368	0.0	0	1,057	0.00	0
15	Washington Street between Mishawum Road and South Street	23,811	14,286	6,190,786	1,500,075	0.76	0.76	4,711,550	9.7	45,702,032	1,479,236	8.73	12,913,730	1,141,645	9.7	11,073,954	358,430	8.73	3,129,096
16	West Street between South Street and Woburn Street	20,229	12,137	5,259,429	1,274,400	0.76	0.76	4,002,733	9.7	38,826,505	1,256,696	8.73	10,970,957	969,893	9.7	9,407,961	304,507	8.73	2,658,347
17	Archestone Circle west of West Street	702	421	182,619	44,250	0.76	0.76	138,984	43.7	6,073,591	43,635	39.33	1,716,176	33,677	43.7	1,471,678	10,573	39.33	415,843
18	North Street between William Street and Route 28	9,904	5,942	182,619	44,250	0.76	0.76	138,984	49.5	6,872,747	43,635	44.51	1,941,988	33,677	49.5	1,665,320	10,573	44.51	470,559
19	North Street between Route 28 and Hopkins Street	13,486	8,091	182,619	44,250	0.76	0.76	138,984	49.5	6,872,747	43,635	44.51	1,941,988	33,677	49.5	1,665,320	10,573	44.51	470,559
20	Route 28 between North Street and Elm Street	28,868	17,321	182,619	44,250	0.76	0.76	138,984	71.1	9,881,746	43,635	63.99	2,792,222	33,677	71.1	2,394,423	10,573	63.99	676,577
									Freeway	0			0		Freeway	0			0
									Arterial	400,574,152			113,187,668		Arterial	97,062,198			27,426,243

Weekday Idle Emission Parameters

	Pollutant	Peak Period Emissions (g/sec)	Peak Period Emissions (g/year)	Peak Period Emissions (tons/year)	Off-Peak Period Emissions (g/sec)	Off-Peak Period Emissions (g/year)	Off-Peak Period Emissions (tons/year)
Freeway	CO2	0.3792	0	0.00	0.3792	0	0.00
Arterial	CO2	0.3792	151,912,183	167.45	0.3792	42,924,851	47.32
Total				167.45			47.32

Weekend Idle Emission Parameters

Pollutant	Peak Period Emissions (g/sec)	Peak Period Emissions (g/year)	Peak Period Emissions (tons/year)	Off-Peak Period Emissions (g/sec)	Off-Peak Period Emissions (g/year)	Off-Peak Period Emissions (tons/year)
CO2	0.3792	0	0.00	0.3792	0	0.00
CO2	0.3792	36,809,491	40.58	0.3792	10,401,022	11.47
			40.58			11.47

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Weeekend

Link No.	Roadway Description	Roadway Type	2007 Existing Condition – Peak – Average Speed (mph)	2007 Existing Condition – Peak – CO2 EMF (g-veh/mi)	2007 Existing Condition – Off Peak – Average Speed (mph)	2007 Existing Condition – Off Peak – CO2 EMF (g-veh/mi)	2012 No Build Alternative – Peak – Average Speed (mph)	2012 No Build Alternative – Peak – CO2 EMF (g-veh/mi)	2012 No Build Alternative – Off Peak – Average Speed (mph)	2012 No Build Alternative – Off Peak – CO2 EMF (g-veh/mi)	2012 Build Alternative – Peak – Average Speed (mph)	2012 Build Alternative – Peak – CO2 EMF (g-veh/mi)	2012 Build Alternative – Off Peak – Average Speed (mph)	2012 Build Alternative – Off Peak – CO2 EMF (g-veh/mi)	2012 Build Alternative With Mitigation – Peak – Average Speed (mph)	2012 Build Alternative With Mitigation – Peak – CO2 EMF (g-veh/mi)	2012 Build Alternative With Mitigation – Off Peak – Average Speed (mph)	2012 Build Alternative With Mitigation – Off Peak – CO2 EMF (g-veh/mi)
1	Route 28 between Parker Road and Summer Avenue	2	30	546.10	40	546.10	30	557.53	40	557.53	30	557.53	40	557.53	30	557.53	40	557.53
2	Route 28 between Summer Avenue and Hopkins Street	2	30	546.10	40	546.10	30	557.53	40	557.53	30	557.53	40	557.53	30	557.53	40	557.53
3	Route 28 between Hopkins Street and South Street	2	30	546.10	40	546.10	30	557.53	40	557.53	30	557.53	40	557.53	30	557.53	40	557.53
4	Route 28 between South Street and Elm Street	2	30	546.10	40	546.10	30	557.53	40	557.53	30	557.53	40	557.53	30	557.53	40	557.53
5	Summer Avenue between eastern end and Main Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
6	Summer Avenue between Route 28 and Woburn Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
7	Hopkins Street between Summer Avenue and Route 28	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
8	Hopkins Street between Route 28 and South Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
9	Hopkins Street between South Street and North Avenue	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
10	South Street between eastern end and Hopkins Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
11	South Street between Hopkins Street and Route 28	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
12	South Street between Route 28 and Walnut Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
13	South Street between Walnut Street and Washington Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
14	Jocob Way between South Street and southern end	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
15	Washington Street between Mishawum Road and South Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
16	West Street between South Street and Woburn Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
17	Archstone Circle west of West Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
18	North Street between William Street and Route 28	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
19	North Street between Route 28 and Hopkins Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
20	Route 28 between North Street and Elm Street	2	30	546.10	40	546.10	30	557.53	40	557.53	30	557.53	40	557.53	30	557.53	40	557.53

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Weeekday

Link No.	Roadway Description	Roadway Type	2007 Existing Condition Peak Average Speed (mph)	2007 Existing Condition Peak CO2 EMF (g-veh/mi)	2007 Existing Condition Off Peak Average Speed (mph)	2007 Existing Condition Off Peak CO2 EMF (g-veh/mi)	2012 No Build Alternative Peak Average Speed (mph)	2012 No Build Alternative Peak CO2 EMF (g-veh/mi)	2012 No Build Alternative Off Peak Average Speed (mph)	2012 No Build Alternative Off Peak CO2 EMF (g-veh/mi)	2012 Build Alternative Peak Average Speed (mph)	2012 Build Alternative Peak CO2 EMF (g-veh/mi)	2012 Build Alternative Off Peak Average Speed (mph)	2012 Build Alternative Off Peak CO2 EMF (g-veh/mi)	2012 Build Alternative With Mitigation Peak Average Speed (mph)	2012 Build Alternative With Mitigation Peak CO2 EMF (g-veh/mi)	2012 Build Alternative With Mitigation Off Peak Average Speed (mph)	2012 Build Alternative With Mitigation Off Peak CO2 EMF (g-veh/mi)
1	Route 28 between Parker Road and Summer Avenue	2	30	546.10	40	546.10	30	557.53	40	557.53	30	557.53	40	557.53	30	557.53	40	557.53
2	Route 28 between Summer Avenue and Hopkins Street	2	30	546.10	40	546.10	30	557.53	40	557.53	30	557.53	40	557.53	30	557.53	40	557.53
3	Route 28 between Hopkins Street and South Street	2	30	546.10	40	546.10	30	557.53	40	557.53	30	557.53	40	557.53	30	557.53	40	557.53
4	Route 28 between South Street and Elm Street	2	30	546.10	40	546.10	30	557.53	40	557.53	30	557.53	40	557.53	30	557.53	40	557.53
5	Summer Avenue between eastern end and Main Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
6	Summer Avenue between Route 28 and Woburn Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
7	Hopkins Street between Summer Avenue and Route 28	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
8	Hopkins Street between Route 28 and South Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
9	Hopkins Street between South Street and North Avenue	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
10	South Street between eastern end and Hopkins Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
11	South Street between Hopkins Street and Route 28	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
12	South Street between Route 28 and Walnut Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
13	South Street between Walnut Street and Washington Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
14	Jocob Way between South Street and southern end	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
15	Washington Street between Mishawum Road and South Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
16	West Street between South Street and Woburn Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
17	Archestone Circle west of West Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
18	North Street between William Street and Route 28	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
19	North Street between Route 28 and Hopkins Street	2	20	546.10	30	546.10	20	557.53	30	557.53	20	557.53	30	557.53	20	557.53	30	557.53
20	Route 28 between North Street and Elm Street	2	30	546.10	40	546.10	30	557.53	40	557.53	30	557.53	40	557.53	30	557.53	40	557.53

Proposed Redevelopment of Addison-Wesley Sit

MOBILE 6.2 Emission Factors

2007			2012		
Vehicle Speed (mph)	CO2 (g/veh-mile) Freeway	Arterial	Vehicle Speed (mph)	CO2 (g/veh-mile) Freeway	Arterial
2.5	546.10	546.10	2.5	557.53	557.53
3	546.10	546.10	3	557.53	557.53
4	546.10	546.10	4	557.53	557.53
5	546.10	546.10	5	557.53	557.53
6	546.10	546.10	6	557.53	557.53
7	546.10	546.10	7	557.53	557.53
8	546.10	546.10	8	557.53	557.53
9	546.10	546.10	9	557.53	557.53
10	546.10	546.10	10	557.53	557.53
11	546.10	546.10	11	557.53	557.53
12	546.10	546.10	12	557.53	557.53
13	546.10	546.10	13	557.53	557.53
14	546.10	546.10	14	557.53	557.53
15	546.10	546.10	15	557.53	557.53
16	546.10	546.10	16	557.53	557.53
17	546.10	546.10	17	557.53	557.53
18	546.10	546.10	18	557.53	557.53
19	546.10	546.10	19	557.53	557.53
20	546.10	546.10	20	557.53	557.53
21	546.10	546.10	21	557.53	557.53
22	546.10	546.10	22	557.53	557.53
23	546.10	546.10	23	557.53	557.53
24	546.10	546.10	24	557.53	557.53
25	546.10	546.10	25	557.53	557.53
26	546.10	546.10	26	557.53	557.53
27	546.10	546.10	27	557.53	557.53
28	546.10	546.10	28	557.53	557.53
29	546.10	546.10	29	557.53	557.53
30	546.10	546.10	30	557.53	557.53
31	546.10	546.10	31	557.53	557.53
32	546.10	546.10	32	557.53	557.53
33	546.10	546.10	33	557.53	557.53
34	546.10	546.10	34	557.53	557.53
35	546.10	546.10	35	557.53	557.53
36	546.10	546.10	36	557.53	557.53
37	546.10	546.10	37	557.53	557.53
38	546.10	546.10	38	557.53	557.53
39	546.10	546.10	39	557.53	557.53
40	546.10	546.10	40	557.53	557.53
41	546.10	546.10	41	557.53	557.53
42	546.10	546.10	42	557.53	557.53
43	546.10	546.10	43	557.53	557.53
44	546.10	546.10	44	557.53	557.53
45	546.10	546.10	45	557.53	557.53
46	546.10	546.10	46	557.53	557.53
47	546.10	546.10	47	557.53	557.53
48	546.10	546.10	48	557.53	557.53
49	546.10	546.10	49	557.53	557.53
50	546.10	546.10	50	557.53	557.53
51	546.10	546.10	51	557.53	557.53
52	546.10	546.10	52	557.53	557.53
53	546.10	546.10	53	557.53	557.53
54	546.10	546.10	54	557.53	557.53
55	546.10	546.10	55	557.53	557.53
56	546.10	546.10	56	557.53	557.53
57	546.10	546.10	57	557.53	557.53
58	546.10	546.10	58	557.53	557.53
59	546.10	546.10	59	557.53	557.53
60	546.10	546.10	60	557.53	557.53
60.7	546.10	546.10	60.7	557.53	557.53

NOTE: Emission factors were calculated by MOBILE 6.2 and represent a composite vehicle type during summer conditions.

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Weekend

Link No.	Description	2007 Existing Condition: Delay By Approach NB or EB (sec)	2007 Existing Condition: Delay By Approach SB or WB (sec)	2007 Existing Condition: Adjusted Delay * NB or EB (sec)	2007 Existing Condition: Adjusted Delay * SB or WB (sec)	2007 Existing Condition: Combined Delay (sec)	2012 No Build Alternative: Delay By Approach NB or EB (sec)	2012 No Build Alternative: Delay By Approach SB or WB (sec)	2012 No Build Alternative: Adjusted Delay * NB or EB (sec)	2012 No Build Alternative: Adjusted Delay * SB or WB (sec)	2012 No Build Alternative: Combined Delay (sec)	2012 Build Alternative: Delay By Approach NB or EB (sec)	2012 Build Alternative: Delay By Approach SB or WB (sec)	2012 Build Alternative: Adjusted Delay * NB or EB (sec)	2012 Build Alternative: Adjusted Delay * SB or WB (sec)	2012 Build Alternative: Combined Delay (sec)	2012 Build Alternative With Mitigation: Delay By Approach NB or EB (sec)	2012 Build Alternative With Mitigation: Delay By Approach SB or WB (sec)	2012 Build Alternative With Mitigation: Adjusted Delay * NB or EB (sec)	2012 Build Alternative With Mitigation: Adjusted Delay * SB or WB (sec)	2012 Build Alternative With Mitigation: Combined Delay (sec)
1	Route 28 between Parker Road and Summer Avenue	[illegible]	[illegible]	5.4	4.5	5.0	[illegible]	[illegible]	7.0	5.3	6.2	[illegible]	[illegible]	7.0	5.3	6.2	[illegible]	[illegible]	7.0	5.3	6.2
2	Route 28 between Summer Avenue and Hopkins Street	[illegible]	[illegible]	5.4	0.0	2.7	[illegible]	[illegible]	7.0	0.0	3.5	[illegible]	[illegible]	7.0	0.0	3.5	[illegible]	[illegible]	7.0	0.0	3.5
3	Route 28 between Hopkins Street and South Street	[illegible]	[illegible]	0.0	5.3	2.7	[illegible]	[illegible]	0.0	8.8	4.4	[illegible]	[illegible]	0.0	8.7	4.4	[illegible]	[illegible]	0.0	7.7	3.9
4	Route 28 between South Street and Elm Street	[illegible]	[illegible]	6.6	5.3	6.0	[illegible]	[illegible]	19.5	8.8	14.2	[illegible]	[illegible]	58.6	8.7	33.7	[illegible]	[illegible]	39.1	7.7	23.4
5	Summer Avenue between eastern end and Main Street	[illegible]	[illegible]	20.2	17.2	18.7	[illegible]	[illegible]	21.4	18.0	19.7	[illegible]	[illegible]	21.4	18.0	19.7	[illegible]	[illegible]	21.4	18.0	19.7
6	Summer Avenue between Route 28 and Woburn Street	[illegible]	[illegible]	20.2	17.2	18.7	[illegible]	[illegible]	21.4	18.0	19.7	[illegible]	[illegible]	21.4	18.0	19.7	[illegible]	[illegible]	21.4	18.0	19.7
7	Hopkins Street between Summer Avenue and Route 28	[illegible]	[illegible]	23.7	120.0	71.9	[illegible]	[illegible]	73.5	120.0	96.8	[illegible]	[illegible]	75.8	120.0	97.9	[illegible]	[illegible]	75.8	120.0	97.9
8	Hopkins Street between Route 28 and South Street	[illegible]	[illegible]	23.7	120.0	71.9	[illegible]	[illegible]	73.5	120.0	96.8	[illegible]	[illegible]	75.8	120.0	97.9	[illegible]	[illegible]	75.8	120.0	97.9
9	Hopkins Street between South Street and North Avenue	[illegible]	[illegible]	23.7	120.0	71.9	[illegible]	[illegible]	73.5	120.0	96.8	[illegible]	[illegible]	75.8	120.0	97.9	[illegible]	[illegible]	75.8	120.0	97.9
10	South Street between eastern end and Hopkins Street	[illegible]	[illegible]	21.1	17.4	19.3	[illegible]	[illegible]	118.3	22.2	70.3	[illegible]	[illegible]	120.0	23.3	71.7	[illegible]	[illegible]	107.9	69.6	88.8
11	South Street between Hopkins Street and Route 28	[illegible]	[illegible]	21.1	17.4	19.3	[illegible]	[illegible]	118.3	22.2	70.3	[illegible]	[illegible]	120.0	23.3	71.7	[illegible]	[illegible]	107.9	69.6	88.8
12	South Street between Route 28 and Walnut Street	[illegible]	[illegible]	0.0	0.0	0.0	[illegible]	[illegible]	0.0	0.0	0.0	[illegible]	[illegible]	0.0	3.7	1.9	[illegible]	[illegible]	0.0	3.7	1.9
13	South Street between Walnut Street and Washington Street	[illegible]	[illegible]	21.1	48.8	35.0	[illegible]	[illegible]	118.3	46.6	82.5	[illegible]	[illegible]	120.0	47.6	83.8	[illegible]	[illegible]	107.9	47.6	77.8
14	Jacob Way between South Street and southern end	[illegible]	[illegible]	0.0	0.0	0.0	[illegible]	[illegible]	0.0	0.0	0.0	[illegible]	[illegible]	14.7	0.0	7.4	[illegible]	[illegible]	14.7	0.0	7.4
15	Washington Street between Mishawum Road and South Street	[illegible]	[illegible]	17.2	2.2	9.7	[illegible]	[illegible]	35.6	2.8	19.2	[illegible]	[illegible]	40.3	2.9	21.6	[illegible]	[illegible]	40.3	2.9	21.6
16	West Street between South Street and Woburn Street	[illegible]	[illegible]	17.2	2.2	9.7	[illegible]	[illegible]	35.6	2.8	19.2	[illegible]	[illegible]	40.3	2.9	21.6	[illegible]	[illegible]	40.3	2.9	21.6
17	Archestone Circle west of West Street	[illegible]	[illegible]	38.6	48.8	43.7	[illegible]	[illegible]	35.1	46.6	40.9	[illegible]	[illegible]	34.6	47.6	41.1	[illegible]	[illegible]	34.6	47.6	41.1
18	North Street between William Street and Route 28	[illegible]	[illegible]	69.1	29.8	49.5	[illegible]	[illegible]	120.0	27.7	73.9	[illegible]	[illegible]	120.0	27.7	73.9	[illegible]	[illegible]	120.0	27.7	73.9
19	North Street between Route 28 and Hopkins Street	[illegible]	[illegible]	69.1	29.8	49.5	[illegible]	[illegible]	120.0	27.7	73.9	[illegible]	[illegible]	120.0	27.7	73.9	[illegible]	[illegible]	120.0	27.7	73.9
20	Route 28 between North Street and Elm Street	[illegible]	[illegible]	42.7	99.5	71.1	[illegible]	[illegible]	30.2	67.7	49.0	[illegible]	[illegible]	30.6	67.7	49.2	[illegible]	[illegible]	30.6	67.7	49.2

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Saturday Peak Condition

		2007 Existing Delay by Approach: Northbound NB.EX	Southbound SB.EX	Eastbound EB.EX	Westbound WB.EX	2012 No Build Delay by Approach: Northbound NB.NB	Southbound SB.NB	Eastbound EB.NB	Westbound WB.NB	2012 Build Delay by Approach: Northbound NB.BL	Southbound SB.BL	Eastbound EB.BL	Westbound WB.BL	2012 Build w/Mit. Delay by Approach: Northbound NB.BLM	Southbound SB.BLM	Eastbound EB.BLM	Westbound WB.BLM
Int1	South Street at West Street	17.2	2.2	38.6	48.8	35.6	2.8	35.1	46.6	40.3	2.9	34.6	47.6	40.3	2.9	34.6	47.6
Int2	South Street at Main Street	6.6	5.3	21.1	17.4	19.5	8.8	118.3	22.2	58.6	8.7	138.2	23.3	39.1	7.7	107.9	69.6
Int3	Summer Street at Main Street	5.4	4.5	20.2	17.2	7.0	5.3	21.4	18.0	7.0	5.3	21.4	18.0	7.0	5.3	21.4	18.0
Int4	Route 128 SB Ramp at Main Street	0.0	N/A	N/A	14.3	0.0	N/A	N/A	17.1	0.0	N/A	N/A	18.5	0.0	N/A	N/A	18.5
Int5	Hopkins and Main Street	0.0	0.0	23.7	313.6	0.0	0.0	73.5	120.0	0.0	0.0	75.8	120.0	0.0	0.0	75.8	120.0
Int6	South Street at Jacob Way	N/A	N/A	0.0	0.0	N/A	N/A	0.0	0.0	14.7	0.0	0.0	3.7	14.7	0.0	0.0	3.7
Int7	North Street at Route 28	42.7	99.5	69.1	29.8	30.2	67.7	131.5	27.7	30.6	67.7	131.5	27.7	30.6	67.7	131.5	27.7

[illegible]

4/30/2008

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Weekday

Link No.	Description	2007 Existing Condition: Delay By Approach NB or EB (sec)	2007 Existing Condition: Delay By Approach SB or WB (sec)	2007 Existing Condition: Adjusted Delay * NB or EB (sec)	2007 Existing Condition: Adjusted Delay * SB or WB (sec)	2007 Existing Condition: Combined Delay (sec)	2012 No Build Alternative: Delay By Approach NB or EB (sec)	2012 No Build Alternative: Delay By Approach SB or WB (sec)	2012 No Build Alternative: Adjusted Delay * NB or EB (sec)	2012 No Build Alternative: Adjusted Delay * SB or WB (sec)	2012 No Build Alternative: Combined Delay (sec)	2012 Build Alternative: Delay By Approach NB or EB (sec)	2012 Build Alternative: Delay By Approach SB or WB (sec)	2012 Build Alternative: Adjusted Delay * NB or EB (sec)	2012 Build Alternative: Adjusted Delay * SB or WB (sec)	2012 Build Alternative: Combined Delay (sec)	2012 Build Alternative With Mitigation: Delay By Approach NB or EB (sec)	2012 Build Alternative With Mitigation: Delay By Approach SB or WB (sec)	2012 Build Alternative With Mitigation: Adjusted Delay * NB or EB (sec)	2012 Build Alternative With Mitigation: Adjusted Delay * SB or WB (sec)	2012 Build Alternative With Mitigation: Combined Delay (sec)
1	Route 28 between Parker Road and Summer Avenue	[illegible]	[illegible]	5.4	4.5	5.0	[illegible]	[illegible]	7.0	5.3	6.2	[illegible]	[illegible]	7.0	5.3	6.2	[illegible]	[illegible]	7.0	5.3	6.2
2	Route 28 between Summer Avenue and Hopkins Street	[illegible]	[illegible]	5.4	0.0	2.7	[illegible]	[illegible]	7.0	0.0	3.5	[illegible]	[illegible]	7.0	0.0	3.5	[illegible]	[illegible]	7.0	0.0	3.5
3	Route 28 between Hopkins Street and South Street	[illegible]	[illegible]	0.0	5.3	2.7	[illegible]	[illegible]	0.0	8.8	4.4	[illegible]	[illegible]	0.0	8.7	4.4	[illegible]	[illegible]	0.0	7.7	3.8
4	Route 28 between South Street and Elm Street	[illegible]	[illegible]	6.6	5.3	6.0	[illegible]	[illegible]	19.5	8.8	14.2	[illegible]	[illegible]	58.6	8.7	33.7	[illegible]	[illegible]	39.1	7.7	23.4
5	Summer Avenue between eastern end and Main Street	[illegible]	[illegible]	20.2	17.2	18.7	[illegible]	[illegible]	21.4	18.0	19.7	[illegible]	[illegible]	21.4	18.0	19.7	[illegible]	[illegible]	21.4	18.0	19.7
6	Summer Avenue between Route 28 and Woburn Street	[illegible]	[illegible]	20.2	17.2	18.7	[illegible]	[illegible]	21.4	18.0	19.7	[illegible]	[illegible]	21.4	18.0	19.7	[illegible]	[illegible]	21.4	18.0	19.7
7	Hopkins Street between Summer Avenue and Route 28	[illegible]	[illegible]	23.7	120.0	71.9	[illegible]	[illegible]	73.5	120.0	96.8	[illegible]	[illegible]	75.8	120.0	97.9	[illegible]	[illegible]	75.8	120.0	97.9
8	Hopkins Street between Route 28 and South Street	[illegible]	[illegible]	23.7	120.0	71.9	[illegible]	[illegible]	73.5	120.0	96.8	[illegible]	[illegible]	75.8	120.0	97.9	[illegible]	[illegible]	75.8	120.0	97.9
9	Hopkins Street between South Street and North Avenue	[illegible]	[illegible]	23.7	120.0	71.9	[illegible]	[illegible]	73.5	120.0	96.8	[illegible]	[illegible]	75.8	120.0	97.9	[illegible]	[illegible]	75.8	120.0	97.9
10	South Street between eastern end and Hopkins Street	[illegible]	[illegible]	21.1	17.4	19.3	[illegible]	[illegible]	116.3	22.2	70.3	[illegible]	[illegible]	120.0	23.3	71.7	[illegible]	[illegible]	107.9	69.6	88.8
11	South Street between Hopkins Street and Route 28	[illegible]	[illegible]	21.1	17.4	19.3	[illegible]	[illegible]	116.3	22.2	70.3	[illegible]	[illegible]	120.0	23.3	71.7	[illegible]	[illegible]	107.9	69.6	88.8
12	South Street between Route 28 and Walnut Street	[illegible]	[illegible]	0.0	0.0	0.0	[illegible]	[illegible]	0.0	0.0	0.0	[illegible]	[illegible]	0.0	3.7	1.9	[illegible]	[illegible]	0.0	3.7	1.9
13	South Street between Walnut Street and Washington Street	[illegible]	[illegible]	21.1	48.8	35.0	[illegible]	[illegible]	118.3	46.6	82.5	[illegible]	[illegible]	120.0	47.6	83.8	[illegible]	[illegible]	107.9	47.6	77.8
14	Jacob Way between South Street and southern end	[illegible]	[illegible]	0.0	0.0	0.0	[illegible]	[illegible]	0.0	0.0	0.0	[illegible]	[illegible]	14.7	0.0	7.4	[illegible]	[illegible]	14.7	0.0	7.4
15	Washington Street between Mishawum Road and South Street	[illegible]	[illegible]	17.2	2.2	9.7	[illegible]	[illegible]	35.6	2.8	19.2	[illegible]	[illegible]	40.3	2.9	21.6	[illegible]	[illegible]	40.3	2.9	21.6
16	West Street between South Street and Woburn Street	[illegible]	[illegible]	17.2	2.2	9.7	[illegible]	[illegible]	35.6	2.8	19.2	[illegible]	[illegible]	40.3	2.9	21.6	[illegible]	[illegible]	40.3	2.9	21.6
17	Archestone Circle west of West Street	[illegible]	[illegible]	38.6	48.8	43.7	[illegible]	[illegible]	35.1	46.6	40.9	[illegible]	[illegible]	34.6	47.6	41.1	[illegible]	[illegible]	34.6	47.6	41.1
18	North Street between William Street and Route 28	[illegible]	[illegible]	69.1	29.8	49.5	[illegible]	[illegible]	120.0	27.7	73.9	[illegible]	[illegible]	120.0	27.7	73.9	[illegible]	[illegible]	120.0	27.7	73.9
19	North Street between Route 28 and Hopkins Street	[illegible]	[illegible]	69.1	29.8	49.5	[illegible]	[illegible]	120.0	27.7	73.9	[illegible]	[illegible]	120.0	27.7	73.9	[illegible]	[illegible]	120.0	27.7	73.9
20	Route 28 between North Street and Elm Street	[illegible]	[illegible]	42.7	99.5	71.1	[illegible]	[illegible]	30.2	67.7	49.0	[illegible]	[illegible]	30.6	67.7	49.2	[illegible]	[illegible]	30.6	67.7	49.2

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

PM Peak Condition

		2007 Existing Delay by Approach: Northbound NB.EX	Southbound SB.EX	Eastbound EB.EX	Westbound WB.EX	2012 No Build Delay by Approach: Northbound NB.NB	Southbound SB.NB	Eastbound EB.NB	Westbound WB.NB	2012 Build Delay by Approach: Northbound NB.BL	Southbound SB.BL	Eastbound EB.BL	Westbound WB.BL	2012 Build w/Mit. Delay by Approach: Northbound NB.BLM	Southbound SB.BLM	Eastbound EB.BLM	Westbound WB.BLM
Int1	South Street at West Street	17.2	2.2	38.6	48.8	35.6	2.8	35.1	46.6	40.3	2.9	34.6	47.6	40.3	2.9	34.6	47.6
Int2	South Street at Main Street	6.6	5.3	21.1	17.4	19.5	8.8	118.3	22.2	58.6	8.7	138.2	23.3	39.1	7.7	107.9	69.6
Int3	Summer Street at Main Street	5.4	4.5	20.2	17.2	7.0	5.3	21.4	18.0	7.0	5.3	21.4	18.0	7.0	5.3	21.4	18.0
Int4	Route 128 SB Ramp at Main Street	0.0	[illegible]	[illegible]	14.3	0.0	[illegible]	[illegible]	17.1	0.0	[illegible]	[illegible]	18.5	0.0	[illegible]	[illegible]	18.5
Int5	Hopkins and Main Street	0.0	0.0	23.7	313.6	0.0	0.0	73.5	120.0	0.0	0.0	75.8	120.0	0.0	0.0	75.8	120.0
Int6	South Street at Jacob Way	[illegible]	[illegible]	0.0	0.0	[illegible]	[illegible]	0.0	0.0	14.7	0.0	0.0	3.7	14.7	0.0	0.0	3.7
Int7	North Street at Route 28	42.7	99.5	69.1	29.8	30.2	67.7	131.5	27.7	30.6	67.7	131.5	27.7	30.6	67.7	131.5	27.7

4/30/2008

Meadow Walk at Lynnfield - Lynnfield, MA

Weekend

Link No.	Roadway Description	2007 Existing Condition: Roadway S.A.F.	2007 Existing Condition: Roadway ADT (veh/day)	2007 Existing Condition: Seasonal ADT (veh/day)	2012 No Build Alternative: Roadway ADT (veh/day)	2012 No Build Alternative: Seasonal ADT (veh/day)	2012 No Build Alternative: Traffic Increase (existing)	2012 Build Alternative: Roadway ADT (veh/day)	2012 Build Alternative: Seasonal ADT (veh/day)	2012 Build Alternative: Traffic Increase (existing)	2012 Build Alternative: Traffic Increase (no-build)	2012 Build Alternative With Mitigation: Roadway ADT (veh/day)	2012 Build Alternative With Mitigation: Seasonal ADT (veh/day)	2012 Build Alternative With Mitigation: Traffic Increase (existing)	2012 Build Alternative With Mitigation: Traffic Increase (no-build)
1	Route 28 between Parker Road and Summer Avenue	100%	14,034	14,034	16,773	16,773	19.5%	16,857	16,857	20.1%	0.5%	16,855	16,855	20.1%	0.5%
2	Route 28 between Summer Avenue and Hopkins Street	100%	13,739	13,739	16,351	16,351	19.0%	16,436	16,436	19.6%	0.5%	16,434	16,434	19.6%	0.5%
3	Route 28 between Hopkins Street and South Street	100%	14,876	14,876	17,574	17,574	18.1%	17,700	17,700	19.0%	0.7%	17,697	17,697	19.0%	0.7%
4	Route 28 between South Street and Elm Street	100%	16,014	16,014	19,723	19,723	23.2%	20,355	20,355	27.1%	3.2%	20,342	20,342	27.0%	3.1%
5	Summer Avenue between eastern end and Main Street	100%	1,180	1,180	1,180	1,180	0.0%	1,180	1,180	0.0%	0.0%	1,180	1,180	0.0%	0.0%
6	Summer Avenue between Route 28 and Woburn Street	100%	1,939	1,939	2,065	2,065	6.5%	2,065	2,065	6.5%	0.0%	2,065	2,065	6.5%	0.0%
7	Hopkins Street between Summer Avenue and Route 28	100%	1,981	1,981	2,276	2,276	14.9%	2,276	2,276	14.9%	0.0%	2,276	2,276	14.9%	0.0%
8	Hopkins Street between Route 28 and South Street	100%	1,812	1,812	2,107	2,107	16.3%	2,107	2,107	16.3%	0.0%	2,107	2,107	16.3%	0.0%
9	Hopkins Street between South Street and North Avenue	100%	1,812	1,812	2,107	2,107	16.3%	2,107	2,107	16.3%	0.0%	2,107	2,107	16.3%	0.0%
10	South Street between eastern end and Hopkins Street	100%	1,939	1,939	2,360	2,360	21.7%	2,402	2,402	23.9%	1.8%	2,401	2,401	23.9%	1.8%
11	South Street between Hopkins Street and Route 28	100%	1,939	1,939	2,360	2,360	21.7%	2,402	2,402	23.9%	1.8%	2,401	2,401	23.9%	1.8%
12	South Street between Route 28 and Walnut Street	100%	3,498	3,498	6,237	6,237	78.3%	6,996	6,996	100.0%	12.2%	6,981	6,981	99.6%	11.9%
13	South Street between Walnut Street and Washington Street	100%	2,613	2,613	3,076	3,076	17.7%	3,245	3,245	24.2%	5.5%	3,242	3,242	24.1%	5.4%
14	Jocob Way between South Street and southern end	100%	42	42	2,655	2,655	6200.0%	3,582	3,582	8400.0%	34.9%	3,564	3,564	8356.0%	34.2%
15	Washington Street between Mishawum Road and South Street	100%	14,286	14,286	15,804	15,804	10.6%	15,129	15,129	5.9%	-4.3%	15,143	15,143	6.0%	-4.2%
16	West Street between South Street and Woburn Street	100%	12,137	12,137	12,811	12,811	5.6%	12,811	12,811	5.6%	0.0%	12,811	12,811	5.6%	0.0%
17	Archestone Circle west of West Street	100%	421	421	927	927	120.0%	927	927	120.0%	0.0%	927	927	120.0%	0.0%
18	North Street between William Street and Route 28	100%	5,942	5,942	6,026	6,026	1.4%	6,026	6,026	1.4%	0.0%	6,026	6,026	1.4%	0.0%
19	North Street between Route 28 and Hopkins Street	100%	8,091	8,091	8,555	8,555	5.7%	8,555	8,555	5.7%	0.0%	8,555	8,555	5.7%	0.0%
20	Route 28 between North Street and Elm Street	100%	17,321	17,321	18,711	18,711	8.0%	18,796	18,796	8.5%	0.5%	18,794	18,794	8.5%	0.4%

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Average Daily Traffic (ADT) for Mesoscale Roadway Network

Weekday

		2007	2012	2012	2012				PM Peak hour volume			
	Roadway Segment	Existing Volume (ADT)	No Build Volume (ADT)	Build Volume (ADT)	Build w/ Mit Volume (ADT)	K Factor	SAF to adjust Avg Annual month to Nov	MHD Count Station Data	2007	2012 NB	2012 BD	2011 BD w/ Miti
						8.4%	118.0%					
1	Route 28 between Parker Road and Summer Avenue	23,389	27,955	28,095	28,092				1,665	1,990	2,000	2,000
2	Route 28 between Summer Avenue and Hopkins Street	22,898	27,252	27,393	27,390				1,630	1,940	1,950	1,950
3	Route 28 between Hopkins Street and South Street	24,794	29,289	29,500	29,496				1,765	2,085	2,100	2,100
4	Route 28 between South Street and Elm Street	26,690	32,871	33,925	33,904				1,900	2,340	2,415	2,414
5	Summer Avenue between eastern end and Main Street	1,967	1,967	1,967	1,967				140	140	140	140
6	Summer Avenue between Route 28 and Woburn Street	3,231	3,442	3,442	3,442				230	245	245	245
7	Hopkins Street between Summer Avenue and Route 28	3,301	3,793	3,793	3,793				235	270	270	270
8	Hopkins Street between Route 28 and South Street	3,020	3,512	3,512	3,512				215	250	250	250
9	Hopkins Street between South Street and North Avenue	3,020	3,512	3,512	3,512				215	250	250	250
10	South Street between eastern end and Hopkins Street	3,231	3,933	4,004	4,002				230	280	285	285
11	South Street between Hopkins Street and Route 28	3,231	3,933	4,004	4,002				230	280	285	285
12	South Street between Route 28 and Walnut Street	5,830	10,395	11,660	11,634				415	740	830	828
13	South Street between Walnut Street and Washington Street	4,355	5,127	5,408	5,403				310	365	385	385
14	Jocob Way between South Street and southern end	70	4,425	5,970	5,939				5	315	425	423
15	Washington Street between Mishawum Road and South Street	23,811	26,339	25,215	25,238				1,695	1,875	1,795	1,797
16	West Street between South Street and Woburn Street	20,229	21,352	21,352	21,352				1,440	1,520	1,520	1,520
17	Archestone Circle west of West Street	702	1,545	1,545	1,545				50	110	110	110
18	North Street between William Street and Route 28	9,904	10,044	10,044	10,044				705	715	715	715
19	North Street between Route 28 and Hopkins Street	13,486	14,258	14,258	14,258				960	1,015	1,015	1,015
20	Route 28 between North Street and Elm Street	28,868	31,186	31,326	31,326				2,055	2,220	2,230	2,230

Proposed Redevelopment of Addison-Wesley Site - Reading, MA

Mesoscale Roadway Data

Link No.	Description	Roadway Type 1=Freeway 2=Arterial	Link Length (miles)	Speed Limit (mph)	Existing				No Build				Build			
					Weekday		Weekend		Weekday		Weekend		Weekday		Weekend	
					Peak Speed (mph)	Off-Peak Speed (mph)	Peak Speed (mph)	Off-Peak Speed (mph)	Peak Speed (mph)	Off-Peak Speed (mph)	Peak Speed (mph)	Off-Peak Speed (mph)	Peak Speed (mph)	Off-Peak Speed (mph)	Peak Speed (mph)	Off-Peak Speed (mph)
1	Route 28 between Parker Road and Summer Avenue	2	0.65	40	30	40	30	40	30	40	30	40	30	40	30	40
2	Route 28 between Summer Avenue and Hopkins Street	2	0.23	40	30	40	30	40	30	40	30	40	30	40	30	40
3	Route 28 between Hopkins Street and South Street	2	0.12	40	30	40	30	40	30	40	30	40	30	40	30	40
4	Route 28 between South Street and Elm Street	2	1.32	40	30	40	30	40	30	40	30	40	30	40	30	40
5	Summer Avenue between eastern end and Main Street	2	0.58	30	20	30	20	30	20	30	20	30	20	30	20	30
6	Summer Avenue between Route 28 and Woburn Street	2	0.91	30	20	30	20	30	20	30	20	30	20	30	20	30
7	Hopkins Street between Summer Avenue and Route 28	2	0.32	30	20	30	20	30	20	30	20	30	20	30	20	30
8	Hopkins Street between Route 28 and South Street	2	0.30	30	20	30	20	30	20	30	20	30	20	30	20	30
9	Hopkins Street between South Street and North Avenue	2	1.22	30	20	30	20	30	20	30	20	30	20	30	20	30
10	South Street between eastern end and Hopkins Street	2	0.10	30	20	30	20	30	20	30	20	30	20	30	20	30
11	South Street between Hopkins Street and Route 28	2	0.23	30	20	30	20	30	20	30	20	30	20	30	20	30
12	South Street between Route 28 and Walnut Street	2	0.54	30	20	30	20	30	20	30	20	30	20	30	20	30
13	South Street between Walnut Street and Washington Street	2	0.67	30	20	30	20	30	20	30	20	30	20	30	20	30
14	Jocob Way between South Street and southern end	2	0.35	30	20	30	20	30	20	30	20	30	20	30	20	30
15	Washington Street between Mishawum Road and South Street	2	0.40	30	20	30	20	30	20	30	20	30	20	30	20	30
16	West Street between South Street and Woburn Street	2	0.60	30	20	30	20	30	20	30	20	30	20	30	20	30
17	Archestone Circle west of West Street	2	0.49	30	20	30	20	30	20	30	20	30	20	30	20	30
18	North Street between William Street and Route 28	2	1.21	30	20	30	20	30	20	30	20	30	20	30	20	30
19	North Street between Route 28 and Hopkins Street	2	0.49	30	20	30	20	30	20	30	20	30	20	30	20	30
20	Route 28 between North Street and Elm Street	2	0.43	40	30	40	30	40	30	40	30	40	30	40	30	40

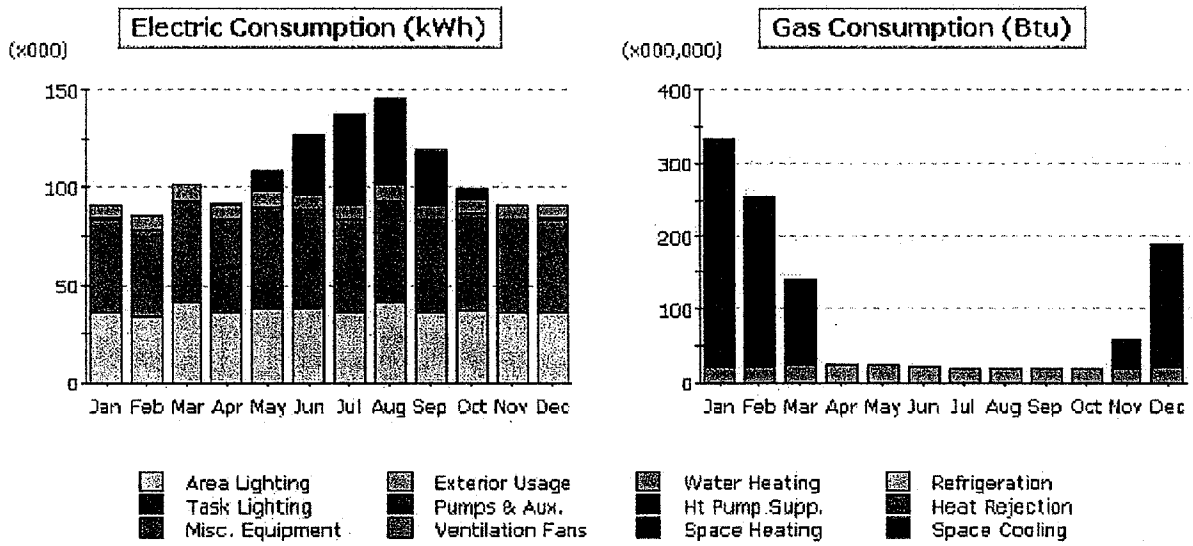
Proposed Redevelopment of Addison-Wesley Site - Reading, MA

STATION 4158 - READING - RTE.I-95 (128) - NORTH OF RTE.I-93

YR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
02	140,863	143,399	145,290	149,103	156,000	163,294	164,406	166,665	157,420	157,000	153,860	138,965	153,022
							Aug- Jan	118%					

Stationary Source Results: CO_2 Emissions

Proposed Redevelopment of Addison-Wesley Site, Reading, MA - Build Conditions (Office)



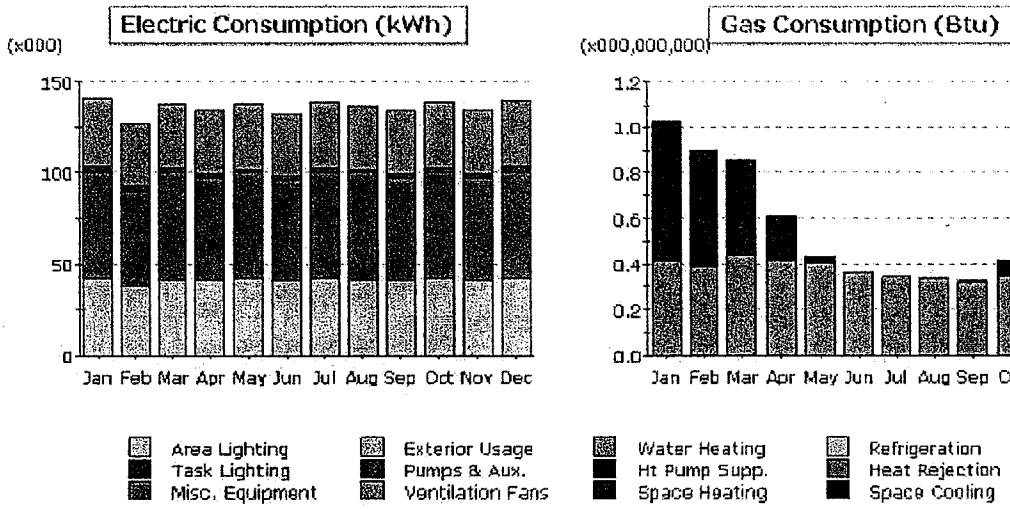
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	1.5	10.8	30.2	46.4	44.7	29.6	5.3	0.6	-	167.9
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.2	6.8	8.3	7.2	7.9	7.9	7.2	8.3	7.2	7.5	7.2	7.2	89.9
Pumps & Aux.	0.4	0.3	0.3	0.5	0.1	-	-	-	0.0	0.1	0.3	0.3	2.2
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	48.3	44.8	52.2	47.6	50.9	50.2	48.3	52.2	47.6	49.6	47.6	48.3	587.5
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	35.4	33.6	40.4	35.4	38.8	38.7	35.4	40.4	35.4	37.1	35.4	35.4	441.4
Total	91.3	85.6	101.3	91.9	108.4	127.0	137.3	145.6	118.7	99.6	91.0	91.3	1,288.9

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	310.2	229.9	111.8	2.8	-	-	-	-	-	-	37.3	168.0	862.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	23.0	22.5	27.1	23.3	23.9	22.2	19.0	20.8	18.1	19.8	20.2	21.7	261.5
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	333.2	252.4	141.0	26.1	23.9	22.2	19.0	20.8	18.1	19.8	57.4	189.6	1,123.5

Proposed Redevelopment of Addison-Wesley Site, Reading, MA - Build Conditions (Residential)



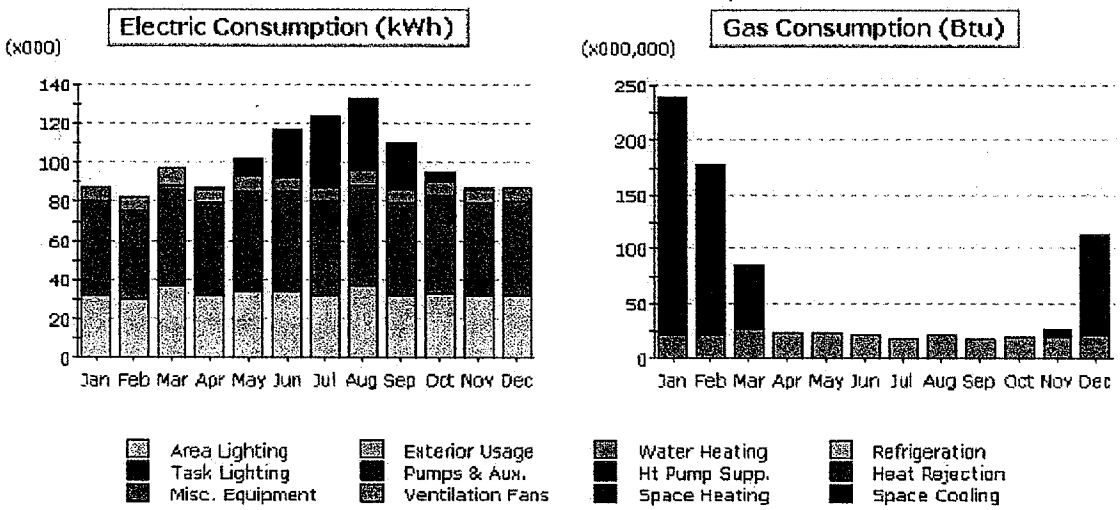
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	36.8	32.9	35.7	34.9	35.7	34.4	35.2	35.5	34.9	36.0	35.0	36.7	424.6
Pumps & Aux.	3.1	2.6	2.5	1.9	1.9	1.8	1.9	1.9	1.9	1.9	2.9	2.8	26.7
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	58.3	52.6	58.2	56.4	58.2	56.3	58.3	58.2	56.4	58.2	56.4	58.3	685.6
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	42.5	38.1	41.7	40.9	42.0	40.5	42.5	41.7	41.0	42.2	41.0	42.5	496.6
Total	140.6	126.3	138.1	134.1	137.8	133.0	138.5	137.3	134.1	138.3	134.7	140.3	1,633.4

Gas Consumption (Btu x000,000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	0.62	0.51	0.42	0.19	0.03	-	-	-	0.01	0.07	0.30	0.52	2.66
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	0.41	0.39	0.44	0.41	0.40	0.36	0.34	0.34	0.32	0.34	0.35	0.39	4.51
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1.03	0.90	0.86	0.61	0.44	0.36	0.34	0.34	0.33	0.41	0.65	0.91	7.18

Proposed Redevelopm't of Addison-Wesley Site, Reading, MA – Improved Build Conditions (Office)



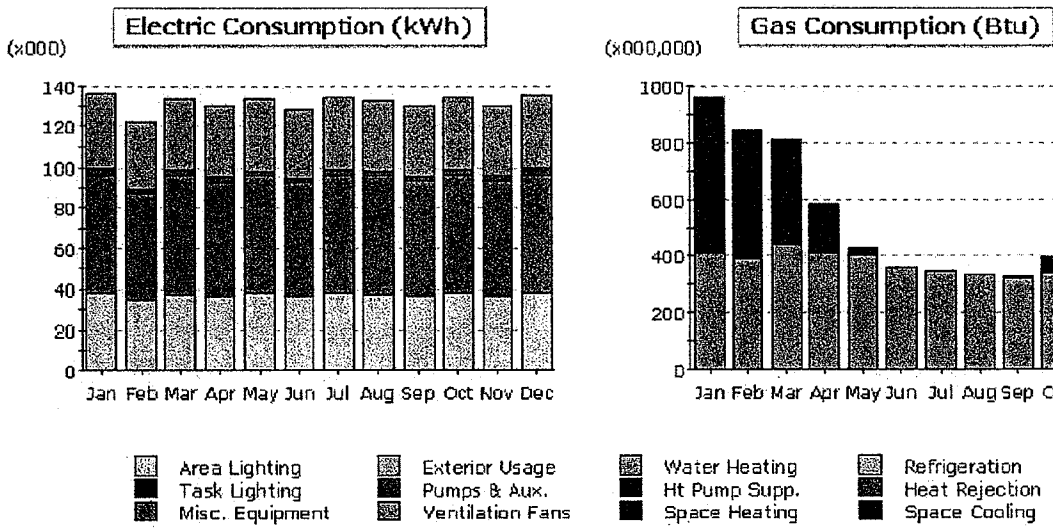
Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	1.4	9.2	24.6	37.6	36.5	24.0	5.0	0.6	-	138.8
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	7.2	6.8	8.2	7.2	7.9	7.9	7.2	8.2	7.2	7.5	7.2	7.2	89.5
Pumps & Aux.	0.4	0.3	0.3	0.3	0.1	-	-	-	0.0	0.1	0.3	0.3	2.2
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	46.3	44.8	52.2	47.6	50.9	50.2	48.3	52.2	47.6	49.6	47.6	48.3	587.5
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	31.8	30.1	36.3	31.7	34.8	34.7	31.8	36.3	31.7	33.3	31.7	31.8	395.7
Total	87.6	82.1	97.0	88.1	102.8	117.3	124.8	133.2	110.5	95.4	87.3	87.5	1,213.7

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	216.87	154.38	56.74	0.51	-	-	-	-	-	-	7.70	91.79	530.00
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	22.99	22.40	27.11	23.27	23.65	22.17	19.03	20.77	18.14	19.74	20.13	21.85	261.33
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	239.86	176.87	83.85	23.78	23.65	22.17	19.03	20.77	18.14	19.74	27.83	113.64	791.33

Proposed Redevelopm't of Addison-Wesley Site, Reading, MA – Improved Build Conditions (Residential)



Electric Consumption (kWh x000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	-	-	-	-	-	-	-	-	-	-	-	-	-
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	-	-	-	-	-	-	-	-	-	-	-	-	-
Vent. Fans	36.7	32.8	35.7	34.9	35.7	34.4	36.2	35.5	34.9	36.0	35.0	36.5	424.2
Pumps & Aux.	3.1	2.6	2.5	1.9	1.9	1.8	1.9	1.9	1.9	1.9	2.3	2.8	26.7
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	58.3	52.6	58.2	56.4	58.2	56.3	58.3	58.2	56.4	58.2	56.4	58.3	685.6
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	38.2	34.3	37.5	36.8	37.8	36.4	38.2	37.5	36.9	38.0	36.9	38.2	446.9
Total	136.3	122.4	133.9	130.0	133.6	129.0	134.6	133.1	130.0	134.1	130.5	135.9	1,583.3

Gas Consumption (Btu x000,000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Space Cool	-	-	-	-	-	-	-	-	-	-	-	-	-
Heat Reject.	-	-	-	-	-	-	-	-	-	-	-	-	-
Refrigeration	-	-	-	-	-	-	-	-	-	-	-	-	-
Space Heat	549.5	455.2	375.4	167.4	26.5	-	-	-	2.6	54.2	266.9	462.4	2,360.0
HP Supp.	-	-	-	-	-	-	-	-	-	-	-	-	-
Hot Water	411.7	390.6	440.4	414.6	401.0	364.3	344.7	337.1	322.2	342.6	353.2	392.1	4,514.4
Vent. Fans	-	-	-	-	-	-	-	-	-	-	-	-	-
Pumps & Aux.	-	-	-	-	-	-	-	-	-	-	-	-	-
Ext. Usage	-	-	-	-	-	-	-	-	-	-	-	-	-
Misc. Equip.	-	-	-	-	-	-	-	-	-	-	-	-	-
Task Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Area Lights	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	961.1	845.7	815.8	581.9	427.6	364.3	344.7	337.1	324.8	396.8	620.1	854.5	6,874.4

Total CO_2 Emissions

Proposed Redevelopment of Addison-Wesley Site, Reading, MA

Stationary Source - CO2 Emission Results

CO2 Conversion Factors	Electricity	1107 lb CO2/Mwh	ISO-New England Marginal Emissions Report
	Gas	117.08 lb CO2/Mbtu	The Energy Information Administration Documentation for Emissions for GHG

Coverage	City	Analysis Year	Building Location
MA	Boston	2012	Reading, MA

	Building Type	Total Elec. (Mwh)	CO2 from electricity (lbs)	s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	s (tons)	TOTAL CO2 (tons)
Baseline Condition (2012)	Office Bldng	1,288.90	1,426,812.30	713.41	1,123.50	131,539.38	65.77	**779.18**
	Multi-type Residential	1,633.40	1,808,173.80	904.09	7,180.00	840,634.40	420.32	**1324.40**
Improved Condition (2012)		Total Elec. (Mwh)	CO2 from electricity (lbs)	s (tons)	Total Gas (Mbtu)	CO2 from gas (lbs)	s (tons)	
	Office Bldng	1213.7	1343565.9	671.78	791.33	92648.9164	46.32	**718.11**
	Multi-type Residential	1583.3	1752713.1	876.36	6874.4	804854.75	402.43	**1278.78**

Proposed Redevelopment of Addison-Wesley Site, Reading, MA

Total CO2 Emission Results (Stationary and Mobile Sources)

Existing Conditions (2006)		Build Conditions (2012)	
CO2 from Building/Energy		CO2 from Building/Energy	
Office	0.0 tons	Office	779.2 tons
		Retail	1,324.4 tons
sum	**0.0 tons**	**sum**	**2,103.6 tons**

Net Increase from No Build to Build
CO2 from Stationary Source
2,103.6 tons

Net Increase from No Build to Build
CO2 from Mobile Source
624.0 tons

Total Yearly CO2 Emission Increase=
2,727.6 tons
2.7 Mega_tons

Improved Build Conditions (2012)	
CO2 from Building/Energy	
Office	718.1 tons
Retail	1,278.8 tons
sum	**1,996.9 tons**

Net Increase from No Build to Build
CO2 from Stationary Source
1,996.9

Net Increase from No Build to Improved Build
CO2 from Mobile Source
578.8 tons

Total Yearly CO2 Emission Increase=
2,575.7 tons
2.6 Mega_tons

The Commonwealth of Mass
Executive Office of Energy and Environ
100 Cambridge Street, Suite 9
Boston, MA 02114

Deval L. Patrick
GOVERNOR

Timothy P. Murray
LIEUTENANT GOVERNOR

Ian A. Bowles
SECRETARY

-No analysis for GHG
in the ENF because
no waiver was requested.

July 25, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Queset Commons
PROJECT MUNICIPALITY	: Easton
PROJECT WATERSHED	: Taunton
EEA NUMBER	: 14266
PROJECT PROPONENT	: Douglas A. King Builders, Inc.
DATE NOTICED IN MONITOR	: June 25, 2008

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and Section 11.03 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of a mandatory Environmental Impact Report (EIR).

Project Description

As described in the Environmental Notification Form (ENF), the project consists of a mixed-use development designed in accordance with the M.G.L. Chapter 40R Smart Growth provisions. The project, Queset Commons, will be located on a 69-acre site situated west of Washington Street (Route 138) and north of Morse's Pond in Easton. The development will consist of seven (7) buildings total: two four-story condominium buildings (60 units), two mixed-use residential (83 assisted living units and 137 rental apartment units) and retail/commercial (60,000 square feet (sf)) buildings, a 16,000 sf conference center, a 15,000 sf food market, two office buildings (25,000 sf total), and a wastewater treatment facility.

Anticipated environmental impacts associated with the project include 21.1 acres of new land alteration, 13.0 acres of new impervious area, 800 sf of direct alteration of Bordering Vegetated Wetlands (BVW), 9,132 additional vehicle trips per day, 910 new parking spaces, and approximately 70,000 gallons per day (gpd) of new water usage and wastewater generation, respectively. The project will include the installation of an on-site wastewater treatment facility, wastewater discharge areas, intersection improvements, and a variety of low-impact design (LID) stormwater management techniques.

Jurisdiction and Permitting

This project is subject to MEPA review and the preparation of a mandatory EIR as it requires a State agency action and will generate 3,000 or more new average daily trips on roadways providing access to a single location (301 CMR 11.03(6)(a)(6)). The project will also exceed the mandatory EIR threshold at 301 CMR 11.03(1)(a)(2) as it will create ten (10) or more acres of impervious area. The project will require a Vehicular Access Permit from the Massachusetts Highway Department (MassHighway) for impact to state-controlled roadways. The project will also require a Major Groundwater Discharge Permit (BRP WP 06) from the Massachusetts Department of Environmental Protection (MassDEP). Coverage under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the U.S. Environmental Protection Agency will be required. Finally, the project must obtain an Order of Conditions from the Easton Conservation Commission, or in the case of an appeal, a Superseding Order of Conditions from MassDEP. The project is subject to the EEA/MEPA Greenhouse Gas (GHG) Emissions Policy.

The project will receive financial assistance from the Massachusetts Department of Housing and Community Development in accordance with M.G.L. Chapter 40R – Smart Growth Zoning and Housing Production Bylaw. Therefore, MEPA jurisdiction for this project is broad and shall extend to all aspects of the project that are likely, directly or indirectly, to cause Damage to the Environment.

SCOPE

General

The Draft Environmental Impact Report (DEIR) should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this scope.

Project Description and Permitting

The DEIR should include a detailed description of the proposed project and describe any changes to the project since the filing of the ENF. The DEIR should provide a brief description and analysis of applicable statutory and regulatory standards and requirements, and a description of how the project will meet those standards. The DEIR should include a list of required permits

and approvals and provide an update on the status of each permit and/or approval. Within the ENF it was unclear what constituted the project site. Some calculations in the ENF noted the presence of existing water and wastewater flows, while other calculations, such as traffic, considered the project site undeveloped. The DEIR should clarify the project site and confirm if the project site includes the existing Queset on the Pond assisted living facility, the Stone Forge restaurant, and the 8-acre proposed conservation restriction. The DEIR should include a summary of existing and proposed environmental impacts associated with thc entire project area.

Alternatives

The project is likely to significantly impact the existing conditions of the project site through the construction of this mixed-use development. The project site contains a MassDEP-approved Zone II for municipal water supply wells, wetland resource areas, and is generally undeveloped in nature.

The DEIR should analyze the following alternatives:

- A No-Build Alternative;
- A Modified Wastewater Disposal Location Alternative, which locates wastewater leaching areas outside the MassDEP-approved Zone II; and,
- A Preferred Alternative.

It is possible that, subsequent to the completion of the alternatives analysis, the Preferred Alternative could be modified in comparison to that presented in the ENF. The alternatives analysis may go beyond the three alternatives requested above and include previously discarded conceptual design plans to support the proponent's conclusion that the Preferred Alternative avoids, minimizes, and mitigates damage to the environment. The DEIR should identify the impacts for each of the alternatives on land alteration (including impervious area), traffic, parking, drainage, wastewater, water supply, historic/archaeological resources, and wetlands in a tabular format. This table, along with a supporting narrative and conceptual site plans, should provide a comparative analysis that clearly shows the differences between the environmental impacts associated with each of the alternatives.

The DEIR should identify and explain any project phasing, including potential impacts on construction sequencing and traffic patterns. It should discuss how this project is compatible with Executive Order 385 – Planning for Growth by discussing its consistency with local land use plans and applicable regional plans.

The DEIR will require the reevaluation of the Preferred Alternative to investigate GHG reductions that may be realized through site design, operations, and architecture. Guidance for this alternatives analysis has been outlined in the MassDEP comment letter on the ENF, and is described in the GHG section of this Certificate.

Land

The project will alter approximately 21.1 acres of land and create 13 acres of new impervious surfaces. While the ENF proposed several ways to reduce impervious areas such as pervious pavement, underground parking and the clustering of buildings. I encourage the proponent to explore in the DEIR the feasibility of further reducing impact in wetland resource buffer zones and grading, thereby reducing overall land impacts associated with the project. The DEIR should outline erosion and sedimentation control best management practices for use during the construction period.

Traffic and Transportation

The ENF stated that the project will result in the generation of approximately 9,132 new vehicle trips on an average weekday. Access to the project site will be provided at the intersection of Belmont Street (Route 123) and Washington Street (Route 138) and the CVS driveway, at the intersection of Route 138 and Roosevelt Circle, and at an additional driveway located approximately 250 feet south of the Route 138/Route 123 intersection. MassHighway Vehicular Access and Traffic Signal permits will be required for the project. Comments received on the ENF indicate that the ENF included a transportation study that does not fully conform to the EOEEA/EOTPW Guidelines for EIR/EIS Traffic Impact Assessments.

The DEIR should include a revised and updated traffic study prepared in conformance with EOEEA/EOTPW Guidelines. The proponent should provide a detailed response to the comment letter dated July 15, 2008 submitted by the Executive Office of Transportation (EOT), and I hereby incorporate by reference the additional requests for information contained in that letter as part of the scope of the DEIR. Furthermore, the DEIR should expand the traffic study area to include not only the additional intersections recommended by EOT, but the Route 138 and Plymouth Drive intersection at the request of the Old Colony Planning Council (OCPC). The DEIR should outline a robust and viable mitigation program, including means to reduce single-occupancy vehicle trips, enhancement of pedestrian and bicycle amenities, and commitments to promote mass transit services. I encourage the proponent to work with the OCPC, the Brockton Area Transit Authority (BAT), and the Massachusetts Bay Transportation Authority (MBTA) to evaluate potential traffic mitigation measures and travel demand management program components. The DEIR should summarize how the project will comply with Massachusetts Idling Regulations and the Massachusetts Rideshare Regulations, if applicable.

Air Quality

The project will be required to conduct an air quality mesoscale analysis, as the projected new daily vehicle trips associated with the project triggers MassDEP's review threshold of 6,000 daily trips for mixed-use projects. The DEIR should contain a mesoscale analysis comparing indirect emissions from transportation sources under various No Build, Build, and Build with Mitigation conditions. The DEIR should demonstrate that the proposed project mobile source

emission impacts will not exceed or contribute to an exceedance of National/State Ambient Air Quality Standards. The mesoscale analysis should also determine to what extent the proposed project will increase the amount of volatile organic compounds (VOCs) and nitrogen oxides (NO_x) emissions in the project area. The mesoscale analysis should also be used to estimate indirect CO_2 emissions from transportation sources in conjunction with the GHG Policy.

Greenhouse Gas Emissions (GHG)

The proposed project is subject to EEA's Greenhouse Gas (GHG) Policy that requires proponents to quantify project-related GHG emissions and propose and quantify the impact of mitigation measures to reduce GHG emissions. A copy of the GHG Policy may be found at: http://www.mass.gov/envir/mepa/pdffiles/misc/GHG%20Policy%20FINAL.pdf. The DEIR must include a GHG analysis that calculates emissions for both mobile and stationary sources and a corresponding mitigation program to reduce overall GHG emissions associated with the project.

The proponent should demonstrate in the DEIR that it has evaluated and committed to GHG-reduction measures consistent with the GHG Policy. The proponent should evaluate additional GHG mitigation alternatives as suggested by MassDEP and the Department of Energy Resources (DOER) in their comments submitted on the ENF. The proponent should clarify which specific measures will be implemented, provide supporting modeling data that reflects the implementation of these measures, and clearly depict how these measures reduce GHG emissions in a future Build with Mitigation scenario.

The DEIR should respond to the comments by MassDEP/DOER with respect to:

- Pursuit of Leadership in Energy and Environmental Design (LEED) and/or Energy Star certifiable project status;
- Explanation of building orientation and discussion of expected impacts on energy usage;
- Energy efficient lighting;
- Interior day-lighting of buildings;
- Duct insulation;
- Incorporation of third-party building commissioning;
- Implementation of building energy management systems;
- Roof and wall insulation;
- Windows and high-albedo roofing materials;
- On-site renewable energy sources. The DEIR should evaluate the use of photovoltaic (PV) systems in accordance with the recommendations of DOER. The DEIR should also investigate the use of solar thermal or geothermal energy sources on-site;
- District heating and cooling systems or if this is infeasible, HVAC systems;
- Wastewater treatment facility energy demands; and
- Materials management.

The GHG analysis should clearly present modeling data inputs, the results of calculations used to quantify Existing Conditions, the Build Conditions, and the impact of proposed emissions-reduction mitigation. If the proponent uses graphics, graphics should be produced so that the reader can understand the results and understand the potential CO_2 reductions associated with individual mitigation measures. In the DEIR, the proponent should fully explain any trade-offs inherent in the evaluation of GHG reduction measures, such as increased impacts on some resources to avoid impacts to other resources.

The DEIR should reflect a commitment to pursue additional GHG mitigation measures in response to the modeling. If the proponent chooses not to model a specific mitigation measure recommended by MassDEP because it determines the measure to be infeasible for this particular project, the DEIR must justify why modeling was not conducted. If, after further evaluation of a GHG mitigation measure using energy modeling software, the proponent does not propose to implement the measure, the DEIR should provide technical and cost analyses to document the rationale for not making the commitment. I strongly encourage the proponent to consult with the MEPA Office, MassDEP and DOER prior to submission of the DEIR with regard to the anticipated content of the GHG analysis.

Wetlands

According to the ENF, the project will directly alter approximately 800 sf of Bordering Vegetated Wetlands (BVWs) in association with a roadway crossing of an intermittent stream. The ENF has indicated that the stream crossing will include construction of a three-sided, open-bottom bridge span. The project site includes a number of wetland resource areas including: Land Under Water, BVW, Bordering Land Subject to Flooding (BLSF), Bank, Isolated Vegetated Wetlands (IVW) and a vernal pool. This project will require the filing of a Notice of Intent with the Easton Conservation Commission.

The DEIR should provide plans at an appropriate scale to accurately discern the location of each wetland area regulated under the Wetlands Protection Act (WPA) located on the project site. Each wetland resource area should be characterized according to 310 CMR 10.00. The DEIR should address the significance of the wetland resources on-site for public and private water supply; riverfront areas; flood control; storm damage prevention; fisheries; shellfish; and wildlife habitat. The DEIR should provide an accurate measurement of each wetland resource area that will be affected by the project and describe the amount of alteration necessary to achieve the Preferred Alternative. The DEIR should clarify if the vernal pool on-site has been certified by the Natural Heritage Endangered Species Program (NHESP).

The DEIR should demonstrate that all wetland impacts have been avoided, and where unavoidable impacts occur, that impacts are minimized and mitigated. The DEIR should include a detailed discussion and accompanying conceptual design plan for the stream crossing showing the roadway, stream crossing or bridge span itself, wetland resource areas to be altered, and associated replication areas. The DEIR should demonstrate that the project will be accomplished in a manner that is consistent with the Performance Standards of the Wetlands Regulations (310 CMR 10.00). Proposed activities, including construction mitigation, erosion and sedimentation

control, phased construction, and drainage discharges or overland flow into wetland areas, should be evaluated. The DEIR should specifically address the impact, if any, to the placement of stormwater outfalls within resource areas. The DEIR should clarify what portions of the project may result in the permanent alteration of wetland resource areas versus temporary impacts to facilitate construction.

The proponent indicated in the ENF the possibility of walking trails and connections to adjacent conservation land. The DEIR should identify any wetland crossings and quantify wetland impacts associated with constructing this trail network. If off-site wetland impacts are anticipated, the DEIR should generally identify these impact areas and discuss how this may affect the potential trail connections.

Stormwater

I commend the proponent for incorporating low impact design (LID) stormwater management techniques in the development plan presented in the ENF. The DEIR should include drainage calculations, stormwater system design plans at a readable scale, best management practice (BMP) designs and models for proprietary BMPs, and a clear description of the stormwater management plan to affirm that the stormwater system design is in conformance with the MassDEP Stormwater Management Regulations (SMR) standards for water quality and quantity impacts. The DEIR should discuss the feasibility of maximizing stormwater infiltration and identify the quantity and quality of flows. Similar calculations should be provided to determine the amount of storwmater that may be used for on-site irrigation purposes. The DEIR should demonstrate that source controls, pollution prevention measures, erosion and sedimentation controls during construction, and the post-development drainage system for the project are designed in compliance with the SMR and standards for water quality and quantity impacts. A draft operation and maintenance plan for the stormwater management system should be presented in the DEIR. Consideration should be given in this plan to the location of snow removal and sanding operations on-site.

Water Supply

Water usage associated with the project is estimated at 70,000 gpd, which combined with the existing demand of 23,250 gpd, will result in a project site total water demand of 93,250 gpd. MassDEP has indicated that the Town of Easton is authorized under the Water Management Act to withdraw on average 2.45 million gallons per day (MGD). Easton's 2007 average day water demand was 2.06 MGD. MassDEP has requested that the DEIR include a detailed estimation of water demand for the project, including outdoor water use, differentiating between water provided from the Town water supply and stormwater runoff. Furthermore, the DEIR should clarify the difference between the estimated 70,000 additional gpd required for the project as stated in the ENF with the availability of 34,000 additional gpd cited in the letter from the Town of Easton (Attachment 7 of the ENF). Water conservation measures that could be incorporated into the project should be outlined in the DEIR.

Wastewater

The project is projected to generate approximately 70,000 gpd of additional wastewater beyond the existing discharges of 23,250 gpd. Total project-generated wastewater discharges are estimated at 93,250 gpd, but the ENF proposes a total wastewater treatment capacity of 150,000 gpd to accommodate future discharges from off-site. Future off-site flows would be flows diverted from existing septic systems to the wastewater treatment facility and would be the responsibility of the Town of Easton. Current wastewater flows associated with the adjacent Queset on the Pond assisted living facility and the Stone Forge restaurant will be diverted from their respective septic systems to the wastewater treatment facility. At the current time, the Town of Easton does not have a municipal sewer system. MassDEP has indicated that the wastewater treatment facility will be required to be constructed to meet Class I Drinking Water Standards and MassDEP Water Reuse Guidelines.

The western portion of the Queset Commons project site lies within a MassDEP approved combined Zone II area for three of Easton's municipal water supply wells. Additionally, the ENF indicates that the entire project site is located within the locally-jurisdictional Aquifer Protection District as defined by the Easton Zoning Bylaw. Portions of the wastewater treatment areas are located within the designated Zone II. The ENF has stated that wastewater discharges will receive an advanced level of treatment prior to discharge. MassDEP has noted that while sanitary wastewater disposal areas are not prohibited in Zone II areas, it is good practice to site groundwater discharge areas as far as feasible from an approved Zone II. As outlined in the Alternatives section of this scope, I have requested that the DEIR evaluate a design alternative that locates wastewater discharge areas outside of the Zone II.

The DEIR should describe the proposed type of wastewater treatment facility, how it will be designed in accordance with MassDEP groundwater discharge regulations, and how the facility avoids, minimizes or mitigates damage to the environment. The DEIR should describe how the wastewater effluent will meet disposal criteria within a Zone II area, including removal rates for criteria pollutants. The DEIR should clarify the potential for expanded wastewater treatment capacity on-site, how the system would be designed to accommodate future flows, and the responsible parties for flows beyond that generated by the Queset Commons project, the Queset on the Pond, and the Stone Forge restaurant.

The DEIR should include a graphic of the Zone II, the proposed leaching fields, and nearby municipal water supply wells. The DEIR should clarify the location of the Preferred Alternative's leaching areas in relation to the approved Zone II area. Furthermore, as directed by MassDEP, the DEIR should, at a minimum, discuss the anticipated impacts to water quality and groundwater flow patterns from the proposed leaching areas, both under normal flow conditions and under drought conditions. The DEIR should also include a discussion of additional monitoring measures that will be enacted within the project site to evaluate the potential project impact on the Zone II.

The ENF also indicated that groundwater removal may be required in association with the construction of underground parking garages. The DEIR should describe how groundwater

will be removed from the underground parking areas and estimate volumes and frequency of discharges.

I acknowledge the comment letters received concerning the proximity of the leaching field to the Zone II for municipal water supply wells and the potential presence of pharmaceuticals and personal care products in the waste stream. However, as indicated in the MassDEP comment letter, applicable regulations do not prohibit the location of wastewater treatment facilities within a Zone II. A full analysis of the potential impact of leaching areas on the water supply will be required in association with the required Major Groundwater Discharge Permit for the project. I encourage the proponent to provide a detailed discussion of the relationship between wastewater and water supply resources for this project in the DEIR.

Historic and Archaeological Resources

The Massachusetts Historical Commission (MHC) has indicated that portions of the project area include one recorded ancient archaeological site (Morse's Pond Site; 19-BR-480) according to a review of the Inventory of Historic and Archaeological Assets of the Commonwealth. The project site is also adjacent to the Morse Mansion (EST.175) at 573 Washington Street, within the Central Street Area (EST.J), a potential historic district eligible for listing in the National Register of Historic Places.

An intensive (locational) archaeological survey (950 CMR 70) was conducted for portions of the current project site in conjunction with the development of the adjacent parcel, currently identified as the Queset on the Pond assisted living facility. The aforementioned Morse's Pond Site was identified during the 2000 survey for the assisted living facility. As no work was proposed at that time within the Morse's Pond Site, no additional archaeological testing was performed to determine site boundaries, contents and significance. MHC has indicated that the current Queset Commons project includes potential impacts to the Morse's Pond Site.

The MHC has requested a site examination of the Morse's Pond Site to gather sufficient information to determine the exact horizontal and vertical boundaries of the site, its internal configuration, and data contents, so that a determination of significance can be made. This site examination will also provide information to assist in consultation to avoid, minimize or mitigate adverse effects to an archaeological resource listed in the Inventory of Archaeological Assets of the Commonwealth. Additionally, I encourage the proponent to conduct an intensive (locational) archaeological survey for the remaining archaeologically sensitive portions of the project area that have not been previously surveyed to locate and identify significant historical or archaeological resources that may be affected by the project. A summary of findings and consultation should be provided in the DEIR as directed in the MHC comment letter.

Construction Period Impacts

The DEIR should describe construction-period schedule and sequencing, site access and truck routing, and best management practices (BMPs) that will be used to avoid and minimize adverse environmental impacts. The DEIR should address potential impacts and mitigation relating to land disturbance, noise, dust, odor, nuisance, vehicle emissions, construction and demolition debris, and construction-related traffic. The proponent must comply with MassDEP's Solid Waste and Air Quality Control regulations during construction. The DEIR should discuss plans for reuse and recycling of construction materials. The proponent should consult with MassDEP for appropriate standards and guidelines for managing demolition and construction waste.

I encourage the proponent to mitigate the construction period impacts of diesel emissions to the maximum extent feasible. This mitigation may be achieved through participation in the MassDEP Diesel Retrofit Program. The proponent should work with MassDEP staff to implement construction-period diesel emission mitigation, which could include the installation of after-engine emission controls such as oxidation catalysts or diesel particulate filters. If the proponent intends to participate in these initiatives, the DEIR should include a clear commitment to such measures. I remind the proponent that off-road equipment engines must use low sulfur diesel (LSD) fuel. I encourage the proponent to further mitigate construction period air quality impacts through the use of ultra low sulfur diesel (ULSD) fuel in off-road engines, which contains even lower sulfur content than LSD.

Mitigation

The Queset Commons project provides numerous opportunities for mitigation of anticipated project impacts. The DEIR should outline a clear commitment to viable and effective mitigation measures to offset impacts on traffic, land, water, wastewater, wetlands, stormwater, and greenhouse gases. The Single EIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include a draft Section 61 Finding for each state agency that will issue permits for the project. Each draft Section 61 Finding should contain clear commitments to implement mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation.

Comments/Circulation

The DEIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the DEIR should include a response to comments. This directive is not intended to, and shall not be construed to, enlarge the scope of the DEIR beyond what has been expressly identified in this certificate.

The proponent should circulate the DEIR to those parties who commented on the ENF, to any state agencies from which the proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations. A copy of the DEIR should be made available for review at the Easton Public Library.

July 25, 2008
Date

Ian A. Bowles

Comments received:

06/25/2008	James M. Azevedo
07/02/2008	Diane E. Peterson
07/08/2008	Massachusetts Historical Commission
07/14/2008	Elaine Dahlgren
07/14/2008	Mary Jacobs
07/15/2008	Donald V. Bennett, Ph.D.
07/15/2008	Old Colony Planning Council
07/15/2008	Easton Conservation Commission
07/15/2008	Easton Department of Planning and Community Development
07/15/2008	Massachusetts Department of Environmental Protection – SERO
07/15/2008	Priscilla Almquist-Olsen, Esq.
07/15/2008	Brockton Area Transit Authority
07/15/2008	Executive Office of Transportation

IAB/HSJ/hsj

PLW Categories for No Build Conditions and Figure 6-18, Annual PLW Categories for Build Conditions. Details are presented in Appendix 3, Qualitative Wind Analysis.

6.3 DAYLIGHT

A daylight analysis will be conducted as part of the next required submittal.

6.4 SOLAR GLARE

A solar glare analysis is designed to measure potential reflective glare from the buildings onto streets, public open spaces, and sidewalk areas to determine the likelihood of visual impairment or discomfort due to reflective spot glare. As a result of the design and use of generally non-reflective materials (e.g. reflective glass will not be used on building exteriors), it is not anticipated that the project will have any adverse solar glare impacts within the site or on adjacent properties including open space along the waterfront side of the site. There will also be no solar heat buildup in nearby buildings resulting from reflected solar energy from the Project's buildings.

6.5 AIR QUALITY

6.5.1 SUMMARY

A mesoscale air quality analysis was performed for the proposed Bayside Expo Center Redevelopment Project (Phase I). Mesoscale emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) were calculated for four scenarios: 2008 Existing, 2013 No-Build, 2013 Build, and 2013 Build with Mitigation. This analysis used the U.S. Environmental Protection Agency (EPA) MOBILE6.2 Mobile Source Emission Factor Model, and followed a protocol approved the Massachusetts Department of Environmental Protection (DEP).

The mesoscale analysis predicts that the emissions of VOC and NOx in the Project study area for the 2013 No-Build and Build cases will be significantly smaller than the emissions for the 2008 Existing case. Emissions of VOC and NOx in the Project study area for the 2013 Build case are predicted to be slightly smaller than the emissions for the 2013 No-Build case.

Even though the future build emissions are predicted to be less than the future no-build emissions, the Project Proponent will encourage the office and retail tenants to mitigate the Project's potential air quality impacts by considering a number of transportation demand management (TDM) strategies for the Project. The project Proponent is also considering traffic signal improvements for Project site driveway

intersections. Incentives will be considered to help increase the effectiveness of the voluntary TDM measures. The TDM measures will improve traffic operations, reduce Project generated vehicle trips, and reduce Project-related motor vehicle air pollutant emissions. These mitigation measures will result in small reductions in VOC and NOx emissions compared to the 2013 Build case. The proposed TDM measures and traffic signal improvements constitute all reasonable and feasible traffic mitigation measures for a project that is served by public transportation.

6.5.2 GREENHOUSE GAS (GHG) EMISSIONS ANALYSIS SUMMARY

Carbon dioxide (CO2) emissions were quantified for build base case and mitigation conditions. Eight mitigation measures were evaluated to reduce the Project's direct and indirect energy-related emissions of CO2 by approximately 33% and 26%, respectively. Reasonable and feasible transportation demand management measures are expected to reduce the CO2 from Project-generated motor vehicle trips by approximately 5%. Overall, mitigation is expected to reduce the Project's overall CO2 emissions by approximately 29%.

6.5.3 AIR QUALITY ANALYSES

MESOSCALE AIR QUALITY ANALYSIS

The Bayside Expo Center Redevelopment Project will be located off of Mount Vernon Street in Columbia Point, Dorchester, at the site of the existing Bayside Expo Center. Phase I of the Project will consist of 300 residential units (380,000 square-feet), 250,000 square-feet of retail space, an additional 105,000 square-feet of office space, and an additional 78-room (45,000 square-feet) hotel. The Project will use the existing site driveways onto Mount Vernon Street and Day Boulevard (see Figure 6-19, Mesoscale Study Area).

With Phase I of the Project complete, the site is expected to generate a total of 11,485 total motor vehicle trips on a weekday and 11,805 total motor vehicle trips on a Saturday. The 2013 No-Build and Build traffic volumes include a 0.25% annual growth in background traffic from 2008. No traffic was added from other planned projects, as the needs of these projects will be addressed in the master plan process, which the Boston Redevelopment Authority is currently conducting for Columbia Point. The average daily traffic volumes generated by the Project were reduced to account for internal capture of trips, whereby different uses within the Project "share" trips (e.g. a Project office trip is satisfied by a Project residential trip). Portions of the Project's traffic were allotted to alternative modes of transportation, such as transit and walking. No credit was taken for Project trips that will be satisfied by vehicles that are already on the local roadways (pass-by trips). See the Transportation Section of this Expanded ENF/PNF (EENF/PNF) for more details on how the traffic volumes were developed.

The Bayside Expo Center site currently has 120,000 square-feet of office space and a 198-room hotel (90,000 square-feet) that will remain as part of the redevelopment. The 2013 No-Build traffic numbers include trips from the existing office and hotel space, as well as the traffic that would be generated by the largest events that could continue to occur at the Bayside Expo Center. The Build traffic numbers include the traffic generated by the existing office and hotel space, with the traffic generated by Phase I of the Bayside Center Redevelopment project. The 2013 No-Build traffic volumes over the study area are larger than the 2013 Build traffic volumes.

The mesoscale air quality analysis was performed to calculate the potential regional air quality effect of the proposed Phase I portion of the Project, using as a measure the total daily emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) in the study area. Specifically, calculations were performed to compare areawide VOC and NOx emissions after the Project is built with existing and future no-build emissions. The analysis procedure followed the latest Massachusetts DEP guidance, and was described in a modeling protocol that was approved by the DEP. The mesoscale indirect source analysis is required because this is a mixed-use Project which is expected to generate more than 3,000 new motor vehicle trips per day.

The purpose of controlling VOC and NOx emissions is to reduce the concentration of ground-level ozone. VOC react with NOx in the presence of sunlight to create ground-level photochemical oxidants (ozone). Motor vehicles are the predominant source of VOC and NOx in an urban environment such as the Project area in Dorchester.

The entire Commonwealth of Massachusetts was classified by the U.S. EPA as a "serious" ozone non-attainment area with regard to the old one-hour ozone standard. Massachusetts was required by the 1990 Clean Air Act Amendments to reduce VOC emissions until attainment of the one-hour Massachusetts and National Ambient Air Quality Standard (NAAQS) for ozone was reached. The Commonwealth developed a State Implementation Plan (SIP) for ozone that showed how these reductions would be achieved. Air monitoring showed that compliance with the one-hour ozone standard has been achieved in most of Eastern Massachusetts.

In 1997, the U.S. EPA established a new eight-hour NAAQS for ozone. In April of 2004, the U.S. EPA designated Eastern Massachusetts as a moderate nonattainment area with respect to the new eight-hour ozone NAAQS. The U.S. EPA revoked the one-hour ozone standard nationwide in 2005, as part of the implementation of the eight-hour ozone NAAQS. The Commonwealth submitted the required final ozone SIP to the U.S. EPA on January 31, 2008. This ozone SIP demonstrates that the entire Commonwealth will comply with the 8-hour ozone NAAQS by the end of the 2009 ozone season (summer). The SIP also demonstrates that the Commonwealth will

achieve reasonable further progress (RFP) towards achieving compliance with the 8-hour ozone NAAQS with sufficient VOC and NOx emissions reductions.

On March 12, 2008, the U.S. EPA strengthened the 8-hour ozone standard by reducing it from 0.08 parts of ozone per million parts of air (ppm) to 0.075 ppm. The U.S. EPA will issue final attainment status designations regarding the new standard no later than March 2011. The Commonwealth will then have three years to submit another SIP to demonstrate compliance with the new ozone standard.

Ozone concentrations in the study area are made up of predominantly three parts: 1) natural ozone; 2) locally generated ozone; and 3) ozone transported from upwind urban areas. Emissions of VOC and NOx in the study area have almost no effect on local ozone levels due to their relatively small size and the fact that photochemical reaction times are not rapid enough to form ozone until a parcel of air has been transported some distance downwind. The VOC and NOx emissions from the study area are insignificant when compared to emissions from the entire region and urban areas upwind (such as Providence, Hartford, and New York City). Total VOC and NOx emissions in Suffolk County are approximately 46,490 kg/summer day and 45,309 kg/summer day, respectively (DEP 2002 Baseline Emission Inventory, September 2007). Emissions of VOC and NOx for the 2013 Build case are predicted to be less than 0.05% and 0.10% of the total emissions in Suffolk County, respectively.

Mesoscale Study Area

The mesoscale study area was defined in accordance with DEP guidance to include the roadway segments in the Project area that will potentially experience an increase of 10% in traffic due to the Project and which currently operate at Level-of-Service (LOS) D, E, or F, or will be degraded to LOS D, E, or F in the future. To be conservative, the mesoscale study area includes the entire traffic study area for the Project and is defined by the following roadway segments (see Figure 6-19):

- Columbia Road – Dorchester Avenue to Koscuiszko Circle
- Columbia Road – Koscuiszko Circle to Old Colony Road
- Old Colony Road – Columbia Road to Morrissey SB Service Road
- Mt. Vernon Street – Morrissey SB Service Road to Harbor Point Boulevard
- Morrissey Boulevard - Koscuiszko Circle to Bianculli Boulevard
- Morrissey SB Service Road – Mt. Vernon Street/Old Colony Road to Bianculli Boulevard
- Morrissey NB Service Road – Mt. Vernon Street to Bianculli Boulevard
- Day Boulevard - Koscuiszko Circle to L Street
- Day Boulevard Extension – Day Boulevard to Mt. Vernon Street.

Mesoscale Analysis Procedure

The mesoscale analysis calculated emissions of VOC and NOx over the study area for four scenarios:

- 2008 Existing
- 2013 No-Build
- 2013 Build
- 2013 Build with Mitigation

The study area roadways were divided into 18 segments for the analysis (see Table A-1 in Part A of Appendix 5, Air Quality Analysis). The vehicle miles traveled (VMT) for each roadway segment was calculated by multiplying the length of each road segment by the average daily traffic volume on the segment. Average daily (24-hour average) traffic volumes (ADTs) were provided by traffic engineers at Tetra Tech Rizzo. Tables A-2 and A-5 in Part A of Appendix 5, Air Quality Analysis show the VMT calculation spreadsheets.

The VOC and NOx emissions for each roadway segment were calculated by multiplying the VMT (miles per day) by the MOBILE6.2 predicted VOC and NOx emission factors in grams per mile. Tables A-3, A-4, A-6, and A-7, in Part A of Appendix 5, Air Quality Analysis, show the VOC and NOx emission calculation spreadsheets. The MOBILE6.2 model was run using input files for 2008 and 2013 that were provided by the MA DEP (see Part B of the Air Quality Appendix for the MOBILE6.2 output). These emission factors were calculated for the warm summertime temperatures, which correspond with the peak ozone season.

MOBILE6.2 predicted VOC and NOx emission factors vary with vehicle speed. Tables A-3, A-4, A-6, and A-7, in Part A of Appendix 5, Air Quality Analysis, show the estimated vehicle speeds and associated MOBILE6.2 VOC and NOx emission rates, respectively, for each roadway segment. The same average motor vehicle speed was used for each roadway segment, for each of the cases analyzed.

Typically Project traffic is estimated by subtracting the No-Build Traffic from the Build traffic. Because the 2013 Build traffic volumes are less than those for the 2013 No-Build case, additional spreadsheets (Tables A-5 to A-7 in Part A of Appendix 5, Air Quality Analysis) were necessary to calculate the emissions for the 2013 Project traffic alone and the 2013 Project traffic alone with mitigation.

Predicted Project Impacts

A summary of the results of the mesoscale analysis is presented in Tables 6-2 and 6-3. Table 6-2 shows that the 2008 Existing VOC mesoscale emissions over the study area are 33.4 kg/day. The mesoscale emissions of VOC for the 2013 No-Build case are predicted to be 23.0 kg/day. This is a 31.1% decrease from the existing mesoscale

VOC emissions. The mesoscale emissions of VOC for the 2013 Build case are predicted to be 22.3 kg/day. This is a 33.2% decrease from the existing mesoscale VOC emissions. Table 6-2 shows that 2013 VOC emissions solely from the Project traffic will be 1.41 kg/day.

Table 6-3 shows that the 2008 Existing NOx mesoscale emissions over the study area are 82.1 kg/day. The mesoscale emissions of NOx for the 2013 No-Build case are predicted to be 45.1 kg/day. This is a 45.1% decrease from the existing mesoscale NOx emissions. The mesoscale emissions of NOx for the 2013 Build case are predicted to be 43.7 kg/day. This is a 46.8% decrease from the existing mesoscale NOx emissions. Table 6-3 shows that 2013 NOx emissions solely from the Project traffic will be 2.76 kg/day.

The U.S. EPA has established more-strict "Tier 2" emission standards for motor vehicles. These standards are being phased in for new motor vehicles between 2004 and 2009. These and past federal motor vehicle emission standards are the reason that newer motor vehicles have lower air pollutant emissions than older vehicles. The MOBILE6.2 model predicts motor vehicle VOC and NOx emissions to decrease significantly between 2008 and 2013, as the new, lower polluting vehicles replace older vehicles on the roadways. The MOBILE6.2 model predicts further declines in VOC and NOx motor vehicle emission rates after 2013.

Measures to Mitigate Air Quality Impacts

The mesoscale analysis results show that the VOC emissions for the 2013 Build case are predicted to be 0.7 kg/day (3.0%) smaller than those for the 2013 No-Build case. NOx emissions for the 2013 Build case are predicted to be 1.4 kg/day (3.1%) smaller than those for the 2013 No-Build case. These emissions reductions occur as the traffic volumes from Phase I of the Project are predicted to be less than what would occur if the existing Bayside Expo Center facility continues to operate.

The primary goal of this mesoscale analysis is to identify all practical and feasible mitigation measures that will help minimize the traffic-related air quality impacts of the proposed Project. The Project Proponents are considering a number of mitigation measures. All reasonable and feasible traffic reduction/mitigation measures are discussed below.

Transportation Demand Management - The Proponents will support and promote transportation demand management (TDM) practices to reduce vehicle trips to and from the Project. The TDM measures are designed to help reduce peak hour and daily vehicle trips through the temporal spreading of the peak hour demand, increased vehicle occupancy rates, and shifts in the mode of transportation away from single occupancy commuter vehicles (SOCVs). The Project Proponents will promote all reasonable TDM strategies to reduce office employee, retail employee, retail

customer, and residential motor vehicle trips. Some of the strategies that will be explored by the Project include:

Flextime – Allows office and retail employees to work nonstandard hours to reduce peak period traffic volumes. The resulting decrease in peak period traffic congestion may result in reduced vehicle emissions from increased travel speeds and reduced delays (idling emissions) at intersections.

Compressed Workweek - Allows office and retail employees to increase the number of hours worked in a day, to reduce the number of days worked in a week. This reduces the number of trips to/from work and also shifts the time of travel to off-peak periods.

Telecommuting - Allows office employees to perform some portion of their work at home using the telephone and/or the internet and reduces the number of trips to/from work.

Ridesharing (car pooling and van pooling) - Reduces the number of trips to/from the Project by combining more than one person in each vehicle.

Public Transportation - Reduces the number of vehicle miles traveled to the Project by providing an alternative mode of transportation. The Massachusetts Bay Transportation Authority (MBTA) provides bus service to the Project site and to the nearby JFK/UMASS redline subway station. The JFK/UMASS station is also a station for the MBTA Old Colony and Greenbush commuter rail lines, which provide commuter rail service to Southeastern Massachusetts and Boston.

The following measures will be implemented by the Project Proponents in an effort to reduce the dependency on the single occupancy private automobile:

Employee Transportation Coordinator

To actively reach out to employees, the Project Proponent will encourage office and retail tenants to implement a "Commuter Services Program" to encourage all project employees and retail customers to seek alternatives to driving to the Project alone. This program would be managed by an Employee Transportation Coordinator who would:

- Post and distribute announcements and newsletters regarding available TDM programs.
- Hold promotional events to encourage ridesharing, using public transit, bicycling and walking.
- Monitor the TDM programs and assist in their evaluation.

- Encourage the office and retail tenants at Bayside Expo Center Redevelopment to provide subsidies for MBTA passes for their employees.
- Coordinate ridesharing programs with supporting agencies.
- Encourage the office and retail tenants to offer their employees benefits from the U.S. DOT/EPA Commuter Choice program. Under this program in 2008, employers may give their employees up to $105 per month ($1,260 per year) in tax-free benefits to commute to work by transit or eligible vanpools. Employees receive the benefit completely free of income taxes. Employers may also give their employees up to $205 per month for commuter parking. The commuter choice program can provide a significant tax savings to both employers and employees.
- Distribute public transportation schedules directly to employees and residents who request ride matching information via the Transportation Coordinator.
- Encourage the retail tenants at to offer discounts to customers who rideshare to the Project.
- Attempt to provide a Zip Car parking space on-site to help provide motor vehicle access to Project employees.
- Investigate creating a local Transportation Management Association (TMA) with other nearby businesses or joining the TranSComm TMA, which serves the South End of Boston, as currently there is no TMA serving the Project area.

Car/Vanpooling and Guaranteed Ride Home Programs

The Project Proponents will encourage the office and retail tenants to institute a ride-matching program (carpool/vanpool) to assist employees with finding appropriate carpool and vanpool matches, and a "Guaranteed Ride Home" program which will provide emergency transportation for employees who travel to work via alternative modes. These programs may be coordinated with MassRIDES or MassCommute. These agencies support carpool and vanpool programs, computerized ride-match programs, and many other TDM programs.

Preferential Parking

The Project Proponents will investigate the feasibility of providing preferential parking spaces for employees who use carpools, to serve as an incentive for ridesharing. These spaces would be the closest available to the building entrances and would only be accessible to employees who register for carpools and customers with at least one passenger. The designated spaces would be monitored to ensure that the license plates of those employees parked in the spots each day match the registrations of participants. In addition, employees will display a "carpool hangtag" that matches their registration. Employees will only be allowed to use these spaces on the days that they are carpooling. The feasibility of providing preferential parking for the retail

customers will be investigated. If feasible, the preferential parking could include customer vehicles that carry at least one passenger, with enforcement by a monitor.

Bicycle Accommodations

The Project Proponent will create incentives for bicycle commuting by providing safe, secure, and weather protected bicycle racks/storage throughout the development. Signs will be posted directing cyclists to the on-site bicycle storage racks and to any nearby bicycle routes.

Additional Measures to Mitigate Air Quality Impacts

The Project Proponent will also encourage the office and retail tenants to consider these additional measures to help mitigate the air quality impacts from the Project:

- Promote the establishment and use of direct deposit of employee paychecks.
- Provide on-site restaurants and banking within the Bayside Expo Center Redevelopment Project for residents, employees and patrons.
- Provide materials that publicize the economic and environmental benefits of the available TDM practices.
- Advocate the use of the internet and shop-by-phone as shopping alternatives for the retail portion of the Project. These shopping alternatives would allow customers to purchase items over the internet or the telephone and to have the purchases shipped to their homes or businesses. The use of the internet and shop-by-phone shopping service has the potential to significantly reduce the number of store related trips.
- Post signs to direct motorists leaving the Project to local routes such as: Dorchester Avenue, Massachusetts Avenue, and I-93.
- Encourage suppliers to schedule their deliveries during weekday afternoon non-peak hours to reduce traffic congestion during busy periods. Also, encourage the store managers to utilize service vendors who currently supply retailers in the Project area.
- Provide sidewalks, marked crosswalks, pedestrian traffic signals, lighting, and landscaping, to encourage pedestrian use within the Project, and between the Project and any nearby neighboring residences or businesses. Full handicapped access will be provided along the roadways within the site. The proposed signalized intersections will include crosswalks and a pedestrian traffic signal phase with warning signals, to allow safe pedestrian passage. Pedestrian connections will be provided to adjacent parks and Carson Beach.

The Massachusetts Idling Regulation (310 CMR 7.11) will be strictly enforced. Signs will be posted in loading areas and in the parking areas near the store entrances that

state that motor vehicle operators can not idle their vehicles for more than five minutes, as per the regulation.

Any single retail or office tenant that employs more than 250 applicable commuting employees will be subject to Massachusetts DEP's Ridesharing Regulation 310 CMR 7.16 [Reduction of Single Occupant Commuter Vehicle Use]. The sizes of the various retail and office tenants for the Project are not known at this time; therefore, it is not known whether any portions of the Project will be subject to the Rideshare Regulation. Nevertheless, the TDM strategies presented above are consistent with the measures that would be expected to achieve the 25% reduction in commuter vehicle use required by DEP's Ridesharing Regulation, and the implementation of the TDM measures would likely allow the Project to comply with DEP's Ridesharing Regulations.

The implementation of the TDM measures will lead to a reduction in Project-related vehicle trips, Project-related VMT, and Project-related air pollutant emissions. It is difficult to quantity the potential trip reduction from these mitigation practices since they will be voluntary and will be most applicable to the Project employees, who will constitute a relatively small part of the average daily trip generation for the Project. A 5% reduction in Project daily motor vehicle traffic is assumed to result from the implementation of the TDM measures described above.

Roadway Improvements. Roadway improvements that improve the traffic flow and reduce intersection delays will result in a decrease in motor vehicle emissions. Traffic signals may be installed at the site drive intersections on Mount Vernon Street and on Day Boulevard. Existing traffic signal timings will be optimized, as warranted. (See the Transportation of this DEIR for more details regarding the roadway improvements planned for the Project area):

Benefits of Mitigation. The implementation of the mitigation measures will decrease the 2013 Build mesoscale VOC emissions by 0.07 kg/day, a decrease of 5%. The implementation of the traffic mitigation measures will reduce the 2013 Build NOx emissions by 0.14 kg/day, a 5% decrease. Specifically, these VOC and NOx emissions reductions could be achieved by a 5% decrease in the Project average daily traffic due to the implementation of the TDM strategies.

Phase I of the proposed Bayside Expo Center Redevelopment Project in Dorchester will result in a small decrease in mesoscale VOC and NOx emissions in the Project study area, compared to the No-Build case. Transportation Demand Management will likely produce a small reduction in the Project's traffic and the resulting VOC and NOx emissions. All reasonable and feasible traffic demand reduction measures have been considered by the Project Proponents to reduce motor vehicle traffic and air pollutant emissions generated by the Project.

The mesoscale air quality analysis demonstrates that the proposed Project will not have an adverse impact on regional air quality and will be compatible with the Commonwealth's SIP that will demonstrate how the Commonwealth will achieve attainment of the eight-hour NAAQS for ozone.

TABLE 6-2: MESOSCALE VOC EMISSIONS SUMMARY

Total Predicted VOC Emissions Burden

2008 Existing	2013 No-Build	2013 Build*
33.4 kg/day (0.037 ton/day)	23.0 kg/day (0.025 ton/day)	22.3 kg/day (0.025 ton/day)

Predicted Project VOC Emissions Burden

2013 Project Traffic*	2013 Project Traffic* with Mitigation
1.41 kg/day	1.34 kg/day
(0.0016 ton/day)	(0.0015 ton/day)

* The 2013 Build emissions include emissions from the project-generated traffic and background traffic. The 2013 Project traffic emissions are emissions solely from Project-generated traffic.

TABLE 6-3, MESOSCALE NO_x EMISSIONS SUMMARY

Total Predicted NO_x Emissions Burden

2008 Existing	2013 No-Build	2013 Build*
82.1 kg/day	45.1 kg/day	43.7 kg/day
(0.090 ton/day)	(0.050 ton/day)	(0.048 ton/day)

Predicted Project NO_x Emissions Burden

2013 Project Traffic*	2013 Project Traffic* with Mitigation
2.76 kg/day	2.62 kg/day
(0.0030 ton/day)	(0.0029 ton/day)

* The 2013 Build emissions include emissions from the project-generated traffic and background traffic. The 2013 Project traffic emissions are emissions solely from Project-generated traffic.

6.6 GREENHOUSE GAS (GHG) EMISSIONS ANALYSIS

6.6.1 BACKGROUND

In October 2007, the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) published the final version of its greenhouse gas (GHG) Policy for MEPA projects: "Greenhouse Gas Emissions Policy and Protocol" in the Environmental Monitor. The Policy requires a project to quantify carbon dioxide (CO2) emissions and identify measures to avoid, minimize or mitigate such emissions. In addition, the Policy requires the proponent to quantify the effect of proposed mitigation in terms of emissions reduction and energy savings. The GHG analysis contained in this section of the EENF conforms to that Policy.

The GHG emissions generated by the proposed Bayside Expo Center Redevelopment project will include direct emissions of CO2 from natural gas combustion for heating and diesel fuel combustion for emergency generators. Indirect emissions of CO2 will result from Project-generated motor vehicle trips and electricity used on the site for lighting, cooking, building cooling and ventilation, and operation of other equipment such as computers.

6.6.2 MODELING ENERGY GHG EMISSIONS

Energy modeling for the Project was performed with the Tech Environmental Energy Model. This model replicates the output of the EPA Energy STAR Target Finder using data and algorithms from the U.S. Department of Energy (DOE) Energy Information Administration (EIA) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers.

Phase I of the Bayside Expo Center Redevelopment project will consist of 11 buildings and two parking garages. Phase I will consist of a total of 780,000 square-feet of new space, in the following configuration:

- 380,000 square-feet residential (300 units)
- 105,000 square-feet office
- 250,000 square-feet retail
- 45,000 square-feet hotel (78 rooms).

The base case design for Phase I of the Project was analyzed and energy use was calculated to be 13,421 MegaWatt-hours per year (MWhr/year) of electricity and 172,778 million cubic-feet per year (Mcf/year) of natural gas, see Table 6-4. The mitigation case and final Project design (Phase I) discussed in Section 2.2.4, will reduce the electricity use to 9,578 MWhr/year and natural gas use to 100,978 Mcf/year, reductions of 28.6% and 41.6 %, respectively. The total Project CO2 emissions for the base case from energy use are calculated to be 16,651 tons/year. The total Project CO2 emissions from energy use are reduced to 11,651 tons/year, a 30% reduction from the base case, with all of the mitigation measures applied.

6.6.3 MODELING TRANSPORTATION GHG EMISSIONS

Transportation CO2 emissions were calculated as part of the mesoscale air quality analysis that is described in Section 2.1 of this report. A summary of the results of the mesoscale analysis for CO2 is presented in Table 6-5. The table shows that the 2008 Existing CO2 mesoscale emissions over the study area are calculated to be 15,695.0 tons/year. The mesoscale emissions of CO2 for the 2013 No-Build case are calculated to be 17,629.5 tons/year. The mesoscale emissions of CO2 for the 2013 Build case are predicted to be 17,118.5 tons/year. The CO2 emissions released solely

by Project-generated motor vehicle trips are calculated to be 1,080 tons/year. The transportation mitigation measures discussed in Sections 2.1.4 and 2.2.4.3 are calculated to reduce the Project transportation CO2 emissions to 1,026 tons/year, a reduction of 5%.

6.6.4 MEASURES TO MITIGATE GHG EMISSIONS

The GHG Policy requires that the Project proponent identify measures to avoid, minimize, or mitigate GHG emissions. The following sections discuss the measures the Bayside Expo Center Redevelopment project will implement.

SITING AND SITE DESIGN MITIGATION MEASURES

All reasonable and feasible siting and site design mitigation measure will be adopted by the Bayside Expo Center Redevelopment project, see Table 6-6. The measures the Project proponent intends to pursue are listed below.

Sustainable Development Principles – The Project design promotes compact development and conserves land. Two existing buildings are planned to be reused for the Project.

Design Project to Support Alternative Transportation to Site – The Project is located in close proximity the MBTA JFK/UMASS redline subway and commuter rail station. The MBTA currently provides bus service to the Project area. The Project Proponent will work with the MBTA to develop an effective and comprehensive transportation plan for the Project. Pathways will be maintained to allow safe and easy pedestrian and bicycle access to the project site.

Low Impact Development for Stormwater Design – The Project design will integrate landscaping and green space in order to generate the least amount of storm water runoff as possible.

Additional siting and site design mitigation measures were also considered for the Bayside Redevelopment project, but were rejected for the reasons given in Table 6-6.

BUILDING DESIGN AND OPERATION MITIGATION MEASURES

All reasonable and feasible building design and building operation mitigation measures will be adopted by the Project, see Table 6-7. These measures are listed below and in aggregate they would reduce the combination of direct and indirect CO2 emissions by 30%, see Table 6-4.

Use High-Albedo Roofing Materials – Light-colored materials will be used for roofs to reflect solar radiation from the building roofs.

High-Efficiency HVAC Systems – The Project will purchase HVAC units with a higher than average Energy Efficiency Ratio (EER), an EER of 11.5.

Increased Boiler/Furnace Efficiency to 95% - Gas-fired boilers and/or furnaces that achieve 95% efficiency will be used for the Project.

Energy Efficient Windows - A thermal break design is used for the Project's metal window frames, and the windows have a low-e coating to provide more shading while maintaining light transmission.

Increase Insulation – Project roof insulation will be upgraded to R-30 and wall insulation will be upgraded to R-19, to minimize heat loss.

Energy Efficient Interior Lighting - Standard fluorescent fixtures, lamps, and ballasts are replaced with high efficiency components. These include specular reflectors, tri-phosphor T-8 lamps, and electronic ballasts. Incandescent lighting is replaced with IR halogen lamps and fluorescent fixtures wherever possible.

Energy Efficient Exterior Lighting – The Project design will use efficient and directed exterior lighting to reduce energy use.

Duct Insulation - Insulation will be wrapped around air supply ducts to reduce energy loss.

Collection of Recyclables – The Project design provides for storage and collection of recyclables.

Building Materials – Whenever possible, the Project will use environmentally friendly building materials, including materials with recycled content, rapidly renewable building materials, and low-VOC paints. Also when practical, the Project will purchase building materials that are manufactured within the region.

Energy Star Appliances – The Project will encourage residents to purchase Energy Star rated appliances with the lowest energy rating to reduce electricity and natural gas consumption.

Additional building design and operation mitigation measures were considered for the Bayside Expo Center Redevelopment project, but were rejected for the reasons given in Table 6-7.

TRANSPORTATION MITIGATION MEASURES

All reasonable and feasible transportation demand mitigation (TDM) measures will be adopted by the Project, see Table 6-8. These measures are listed below and in aggregate they would reduce CO2 transportation emissions by 5%.

Locate New Buildings in or Near Areas Designated for Transit-Oriented Development - The Project is located in proximity the MBTA JFK/UMASS Redline subway and commuter rail station. The MBTA currently provides bus service to the Project area.

Join or form a Transportation Management Association – The project proponent will investigate creating a local Transportation Management Association (TMA) with other nearby businesses or joining the TranSComm TMA, which serves nearby areas in South Boston, as currently there is no TMA serving the Project area.

Provide New Transit Service or Support Extension of Existing Transit - The Project Proponent will work with the MBTA to develop an effective and comprehensive transportation plan for the Project.

Multi-use Paths – The project will incorporate multi-use paths to and through the site to encourage alternate transportation within the property. Pathways will be maintained between the Project and nearby parks and Carson Beach.

Parking Capacity – The Project's parking capacity is sized to meet, but not exceed, local parking requirements.
Parking Management – The Project will develop a parking management program to minimize parking requirements.

Rideshare/Transit Information – The Project will encourage the retail and office tenants to develop and implement a Marketing/Information Program that distributes ridesharing/transit information to residents and employees.

Use of Pre-Tax Dollars for Non-Single Occupancy Vehicle Commuting Costs - Office and retail tenants will be encouraged to offer their employees benefits from the U.S. DOT/EPA Commuter Choice program. Under this program in 2008, employers may give their employees up to $105 per month ($1,260 per year) in tax-free benefits to commute to work by transit or eligible vanpools. Employees receive the benefit completely free of income taxes. Employers may also give their employees up to $205 per month for commuter parking.

Reduce Employee Trips During Peak Periods Through Alternative Work Schedules - Commercial tenants will be encouraged to allow employees to work nonstandard hours to reduce peak period traffic impacts.

Provide a Guaranteed Ride Home Program - The Project Proponent will encourage the commercial tenants to institute a ride-matching program (carpool/vanpool) and a "Guaranteed Ride Home" program which will provide emergency transportation for employees who travel to work via alternative modes.

Provide On-Site Amenities Such as Banks, Dry Cleaning, Food Service, Childcare – The project retail space will likely provide on-site services such as restaurants, dry cleaning, and banking, within the Bayside Expo Center Redevelopment Project. Childcare service may also be provided within the Project.

Bicycle Storage – The Project will provide secure bicycle storage racks.

Traffic Signalization Coordination to Improve Traffic Flow and Support Pedestrian Safety – The Project proponent may install traffic signals at site driveways and optimize signal timing at nearby intersections to reduce intersections traffic delays. See the Transportation Section in the EENF/PNF for more details.

Provide No-Idling Truck Zones at loading/Off-Loading Areas – The Massachusetts Idling Regulation (310 CMR 7.11) will be strictly enforced. Signs that state that motor vehicle operators cannot idle their vehicles for more than five minutes will be posted at loading/off-loading areas and in the parking areas near building entrances, as per the regulation.

Additional transportation mitigation measures were also considered for the Bayside Expo Center Redevelopment project, but were rejected for the reasons given in Table 6-8.

MITIGATION SUMMARY

Table 6-9 summarizes the CO2 emissions for the Bayside Expo Center Redevelopment project, for the base case and original Project design with no TDMs or energy efficiency measures, and for the mitigation case and final Project design with TDMs and eight energy efficiency measures. With all of the proposed mitigation measures included in the Project, total CO2 emissions are reduced 28.5% from 17,731 tons/year to 12,677 tons/year.

TABLE 6-4: ENERGY AND CO2 MODELING RESULTS

Office	Area (sf)	Electrical Usage (MWh/yr)	Electrical Reduction (%)	Gas Usage (Mcf/yr)	Gas Reduction (%)	Heating CO2 Emissions (tons/yr)	Electrical CO2 Emissions (tons/yr)	CO2 Emissions (tons/yr)	CO2 Emissions Reduction (%)
Base Case	105,000	2965.7		24,159.7		1602.0	2043.3	3645.3	
Cool Roof Design	105,000	2902.6	-2.1%	24,374.6	0.9%	1615.0	2002.9	3617.8	-0.8%
Duct Insulation	105,000	2872.1	-3.2%	19,611.1	-18.8%	1327.7	1983.3	3311.1	-9.2%
Increase Furnace/Boiler Efficiency to 95%	105,000	2965.7	0.0%	20,895.1	-13.5%	1405.2	2043.3	3448.4	-5.4%
Programmable Thermostat	105,000	2882.5	-2.8%	22,092.2	-8.6%	1477.4	1990.0	3467.4	-4.9%
Efficient Windows	105,000	2631.8	-11.3%	19,690.0	-18.5%	1332.5	1829.6	3162.1	-13.3%
R-30 roof upgrade, R-19 wall upgrade	105,000	2759.1	-7.0%	20,515.6	-15.1%	1382.3	1911.0	3293.3	-9.7%
Energy Efficient HVAC (EER = 11.5)	105,000	2800.8	-5.6%	24,159.7	0.0%	1602.0	1937.7	3539.7	-2.9%
Energy Efficient Lighting	105,000	2823.3	-4.8%	24,159.7	0.0%	1602.0	1952.1	3554.1	-2.5%
Combined Efficiency Measures	105,000	2115.4	-28.7%	11,270.0	-53.4%	824.8	1499.0	2323.8	-36.3%

Residential	Area (sf)	Electrical Usage (MWh/yr)	Electrical Reduction (%)	Gas Usage (Mcf/yr)	Gas Reduction (%)	Heating CO2 Emissions (tons/yr)	Electrical CO2 Emissions (tons/yr)	CO2 Emissions (tons/yr)	CO2 Emissions Reduction (%)
Base Case	380,000	5451.7		57,356.1		3,984.0	4,014.6	7,998.6	
Cool Roof Design	380,000	5329.1	-2.2%	57,757.4	0.7%	4,008.2	3,936.1	7,944.4	-0.7%
Duct Insulation	380,000	5273.9	-3.3%	49,043.9	-14.5%	3,482.8	3,900.8	7,383.6	-7.7%
Increase Furnace/Boiler Efficiency to 95%	380,000	5451.7	0.0%	51,390.4	-10.4%	3,624.3	4,014.6	7,638.9	-4.5%
Programmable Thermostat	380,000	5293.8	-2.9%	53,577.8	-6.6%	3,756.2	3,913.5	7,669.7	-4.1%
Efficient Windows	380,000	4834.5	-11.3%	49,384.0	-13.9%	3,503.3	3,619.6	7,122.9	-10.9%
R-30 roof upgrade, R-19 wall upgrade	380,000	5058.1	-7.2%	50,675.4	-11.6%	3,581.2	3,762.6	7,343.8	-8.2%
Energy Efficient HVAC (EER = 11.5)	380,000	5138.6	-5.7%	57,356.1	0.0%	3,984.0	3,814.2	7,798.2	-2.5%
Energy Efficient Lighting	380,000	5297.1	-2.8%	57,356.1	0.0%	3,984.0	3,915.6	7,899.7	-1.2%
Combined Efficiency Measures	380,000	3960.8	-27.3%	33,897.2	-40.9%	2,569.5	3,060.4	5,629.9	-29.6%

Hotel	Area (sf)	Electrical Usage (MWh/yr)	Electrical Reduction (%)	Gas Usage (Mcf/yr)	Gas Reduction (%)	Heating CO2 Emissions (tons/yr)	Electrical CO2 Emissions (tons/yr)	CO2 Emissions (tons/yr)	CO2 Emissions Reduction (%)
Base Case	45000	536.4		20820.6		1317.7	405.5	1723.2	
Cool Roof Design	45000	528.1	-1.6%	20862.8	0.2%	1320.3	400.2	1720.4	-0.2%
Duct Insulation	45000	524.7	-2.2%	19941.6	-4.2%	1264.7	398.1	1662.8	-3.5%
Increase Furnace/Boiler Efficiency to 95%	45000	536.4	0.0%	20189.7	-3.0%	1279.7	405.5	1685.2	-2.2%
Programmable Thermostat	45000	526.0	-1.9%	20421.0	-1.9%	1293.6	398.9	1692.5	-1.8%
Efficient Windows	45000	497.6	-7.2%	19973.5	-4.1%	1266.6	380.7	1647.3	-4.4%
R-30 roof upgrade, R-19 wall upgrade	45000	510.4	-4.8%	20114.5	-3.4%	1275.1	388.9	1664.0	-3.4%
Energy Efficient HVAC (EER = 11.5)	45000	515.8	-3.8%	20820.6	0.0%	1317.7	392.4	1710.1	-0.8%
Energy Efficient Lighting	45000	496.1	-7.5%	20820.6	0.0%	1317.7	379.7	1697.4	-1.5%
Combined Efficiency Measures	45000	409.2	-23.7%	18337.8	-11.9%	1168.0	324.1	1492.1	-13.4%

TABLE 6-4 (continued)

Retail	Area (sf)	Electrical Usage (MWh/yr)	Electrical Reduction (%)	Gas Usage (therms/yr)	Gas Reduction (%)	Electrical CO2 Emissions (tons/yr)	Heating CO2 Emissions (tons/yr)	CO2 Emissions (tons/yr)	CO2 Emissions Reduction (%)
Base Case	250,000	4,467.1		70,441.3		2,858.9	424.8	3,283.7	
Cool Roof Design	250,000	4,450.4	-0.4%	70,593.6	0.2%	2,848.3	425.7	3,274.0	-0.3%
Duct Insulation	250,000	4,454.5	-0.3%	59,940.8	-14.9%	2,850.9	361.4	3,212.3	-2.2%
Increase Furnace/Boiler Efficiency to 95%	250,000	4,467.1	0.0%	60,688.5	-13.8%	2,858.9	366.0	3,224.9	-1.8%
Programmable Thermostat	250,000	4,358.3	-2.4%	64,264.5	-8.8%	2,789.3	387.5	3,176.8	-3.3%
Efficient Windows	250,000	4,116.4	-7.9%	59,760.7	-15.2%	2,634.5	360.4	2,994.9	-8.8%
R-30 roof upgrade, R-19 wall upgrade	250,000	4,361.9	-2.4%	65,015.0	-7.7%	2,791.6	392.0	3,183.7	-3.0%
Energy Efficient HVAC (EER = 11.5)	250,000	4,239.9	-5.1%	70,441.3	0.0%	2,713.6	424.8	3,138.3	-4.4%
Energy Efficient Lighting Systems	250,000	3,788.9	-15.2%	70,441.3	0.0%	2,424.9	424.8	2,849.7	-13.2%
Combined Efficiency Measures	250,000	3,092.8	-30.8%	37,473.4	-46.8%	1,979.4	226.0	2,205.3	-32.8%
Bayside Expo Center Redevelopment (Facility Total)	**Area (sf)**	**Electrical Usage (MWhr/yr)**	**Electrical Reduction (%)**	**Gas Usage (Mcf/yr)**	**Gas Reduction (%)**	**Heating CO2 Emissions (tons/yr)**	**Electrical CO2 Emissions (tons/yr)**	**CO2 Emissions (tons/yr)**	**CO2 Emissions Reduction (%)**
Base Case	780,000	13,421		172,778		9,763	6,888	16,651	
Cool Roof Design	780,000	13,210	-1.6%	173,588	0.5%	9,792	6,765	16,557	-0.6%
Duct Insulation	780,000	13,125	-2.2%	148,537	-14.0%	8,926	6,644	15,570	-6.5%
Increase Furnace/Boiler Efficiency to 95%	780,000	13,421	0.0%	153,164	-11.4%	9,168	6,829	15,997	-3.9%
Programmable Thermostat	780,000	13,061	-2.7%	160,356	-7.2%	9,316	6,690	16,006	-3.9%
Efficient Windows	780,000	12,080	-10.0%	148,808	-13.9%	8,737	6,190	14,927	-10.4%
R-30 roof upgrade, R-19 wall upgrade	780,000	12,690	-5.4%	156,321	-9.5%	9,030	6,455	15,485	-7.0%
Energy Efficient HVAC (EER = 11.5)	780,000	12,695	-5.4%	172,778	0.0%	9,617	6,569	16,186	-2.8%
Energy Efficient Lighting	780,000	12,405	-7.6%	172,778	0.0%	9,329	6,672	16,001	-3.9%
Combined Efficiency Measures	780,000	9,578	-28.6%	100,978	-41.6%	6,542	5,109	11,651	-30.0%

TABLE 6-5: MESOSCALE MOTOR VEHCILE CO_2 EMISSIONS SUMMARY

Total Predicted CO_2 Emissions Burden

2008 Existing	2013 No-Build	2013 Build*
39,056.6 kg/day	43,876.2 kg/day	42,556.7 kg/day
43.0 ton/day	48.3 ton/day	46.9 ton/day
15,695.0 ton/year	17,629.5 ton/year	17,118.5 ton/year

Predicted Project CO_2 Emissions Burden

2013 Project Traffic*	2013 Project Traffic with Mitigation
2,688.5 kg/day	2,554.1 kg/day
2.96 ton/day	2.81 ton/day
1,080 ton/year	1,026 ton/year

* The 2013 Build emissions include emissions from the project-generated traffic and background traffic. The 2013 Project traffic emissions are emissions solely from Project-generated traffic.

TABLE 6-6: PROJECT SITING AND SITE DESIGN MITIGATION MEASURES

Suggested Mitigation Measure	Part of Project Design	Technically Infeasible	Inappropriate to Project Type
Sustainable Development Principles	✓		
Protection for open space on the Project site		✓	
Conserve and restore natural areas on-site		✓	
Minimize building footprint		✓	
Design Project to support alternative transportation to site	✓		
Use low impact development for storm water design	✓		
Minimize energy use through building orientation		✓	

TABLE 6-7: BUILDING DESIGN AND OPERATION MITIGATION MEASURES

Suggested Mitigation Measure	Part of Project Design	Technically Infeasible	Inappropriate to Project Type
Construct green roofs		·	✓
Use high-albedo roofing materials	✓	·	
Install high-efficiency HVAC systems	✓	·	·
Eliminate or reduce refrigerants in HVAC systems	·	✓	·
Reduce energy demand by using peak shaving or load shifting strategies	·	·	✓
Maximize interior day-lighting	·	·	✓
Incorporate window glazing to balance and optimize day-lighting, heat loss and solar heat gain	✓	·	·
Increase insulation to minimize heat loss	✓	·	·
Incorporate motion sensors in lighting and climate control	·	·	✓
Use efficient, directed exterior lighting	✓	·	·
Incorporate on-site renewable energy sources into project	·	·	✓
Incorporate combined heat and power (CHP) technologies into project	·	·	✓
Use water conserving fixtures that exceed building code requirements	·	·	✓
Re-use gray water and/or collect and re-use rain water	·	·	✓
Provide for storage and collection of recyclables in building design	✓	·	·
Re-use building materials and products	·	✓	·
Use building materials with recycled content	Cannot be confirmed but will be used if possible		
Use building materials that are manufactured within the region	Cannot be confirmed but will be used if possible		
Use rapidly renewable building materials	✓	·	·
Use wood that is certified in accordance with the Forestry Stewardship Council	Cannot be confirmed but will be used if possible		
Use low-VOC adhesives, sealants, paints, carpets and wood	✓	·	·
Conduct 3rd party building commissioning to ensure energy performance	·	✓	
Track energy performance of building and develop strategy to maintain efficiency	·	·	✓
Provide construction and design guidelines to facilitate sustainable design for build-out by tenants	·	·	✓
Purchase Energy Star rated appliances that are the lowest energy rating	✓	·	·

TABLE 6-8: TRANSPORTATION DEMAND MITIGATION MEASURES

Suggested Mitigation Measure	Part of Project Design	Technically Infeasible	Inappropriate to Project Type
Locate new buildings in or near areas designated for transit-oriented development	✓		▪
Purchase alternative fuel and/or fuel efficient vehicles for fleet	▪	▪	✓
Join or form a Transportation Management Association	✓	▪	
Provide new transit service or support extension of existing transit	✓	▪	
Support expansion of parking at Park-n-Ride lots or transit stations	▪	▪	✓
Develop multi-use paths to and through site	✓	▪	▪
Size parking capacity to meet, but not exceed, local parking requirements	✓	▪	▪
Pursue opportunities to minimize parking supply through shared parking		▪	✓
Develop a parking management program to minimize parking requirements	✓	▪	▪
Develop and implement a Marketing/Information Program that distributes ridesharing/transit information	✓	▪	▪
Subsidize transit passes	To be evaluated for economic feasibility		
Use of pre-tax dollars for non-single occupancy vehicle commuting costs	✓		
Reduce employee trips during peak periods through alternative work schedules	✓		
Provide a guaranteed ride home program	✓		
Provide on-site amenities such as banks, dry cleaning, food service, childcare	✓		
Provide bicycle racks and storage	✓		
Roadway improvements to improve traffic flow			✓
Traffic signalization and coordination to improve traffic flow and support pedestrian safety	✓		
Make on and off-site improvements to reduce VMT			✓
Provide no-idling truck zones at loading/off-loading areas	✓		

TABLE 6-9: GREENHOUSE GAS (CO_2) EMISSIONS SUMMARY

Source	Base Case and Initial Project Design (No Energy Efficiency Measures)	Mitigation Case and Final Project Design (All Energy Efficiency Measures)	Percent Reduction in GHG Emissions
Direct Emissions	9,763	6,542	33.0%
Indirect Emissions	6,888	5,109	25.8%
Subtotal Direct and Indirect Emissions	16,651	11,651	30.0%
Transportation Emissions	1,080	1,026	5.0%
Total CO_2 Emissions	17,731	12,677	28.5%

6.7 WATER QUALITY

The Bayside project site is currently developed and underlain by urban fill and does not contain any surface water bodies or wetlands. It is completely developed, with buildings and pavement covering approximately ninety-two percent of the project site. There are two stormwater drainage watershed areas on the site. The stormwater from most of the project site flows to catch basins in the paved areas or roof drains and then through a closed pipe system which connects to the BWSC conduit located along the northerly side of the project site. During periods of heavy rain, this combined sewer overflow discharges into Dorchester Bay adjacent to the project site. BWSC and MWRA are presently working to eliminate this combine sewer overflow (CSO). The BWSC Morrissey Boulevard drain conduit is under construction, and when completed, will discharge the stormwater into Dorchester Bay near the Morrissey Boulevard/University of Massachusetts access drive intersection. The stormwater presently flowing to the combined sewer will be diverted to the new Morrissey Boulevard drain conduit when it is completed.

The stormwater runoff in the southerly portion of the project site flows to catch basins and then through a closed piping system to a 24-inch drain line in Mount Vernon Street. This drain line flows easterly in Mount Vernon Street and discharges to Dorchester Bay near the southerly terminus of Mount Vernon Street.

The proposed development will result in a decrease in impervious area resulting in a decrease in the peak rate and volume of stormwater runoff. The proposed stormwater system will include Stormwater Best Management Practices (BMP). All stormwater runoff

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IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

August 15, 2008

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

RE: Boston, Dorchester
Bayside
150 Mount Vernon Street
EEA # 14273

Attn: MEPA Unit

Dear Secretary Bowles:

The Department of Environmental Protection in collaboration with the Division of Energy Resources in the Executive Office of Energy and Environmental Affairs (EEA-DOER) have reviewed the Expanded Environmental Notification Form (EENF)/Project Notification Form submitted by Corcoran Jennison Companies to redevelop a mixed-use development on a 28-acre waterfront site formerly used by the Bayside Exposition Center in Dorchester (EEA# 14273). The Bayside is a mixed-use project which is estimated to total 990,000 square feet at full build out, including in Phase I, about 300 residential units, 250,000 square feet of retail space, and 105,000 sf of office. The later phases of the development are planned to add an additional 650 unts of residential housing; however, office may be substituted for residential units, depending on market conditions. There presently are 2,295 spaces on the site, which will be reduced to 1,884 at full build. The project is categorically included for the preparation of an environmental impact report and the proponent is requesting the filing of a single EIR through the submission of an expanded ENF. The Department and EEA/DOER provide the following comments.

Waterways

As described in the EENF, the project site contains approximately 10.8 acres of previously authorized filled private tidelands. The site is entirely separated from the nearest flowed tidelands in Dorchester Bay by the Department of Conservation and Recreation's (DCR) Dorchester Shores Reservation. Only relatively small portions of most of the buildings proposed in Phase 1 are subject to c.91 jurisdiction as shown in Figure 4-2. Each of the buildings proposed in Phase 2 is entirely or substantially within c. 91 jurisdiction (Figure 4-3). In addition, parking areas, roadways, open space, and utilities are located within jurisdiction in both phases of the project. It is the Waterways regulatory program (WRP's) understanding that the proponent also is in negotiation with DCR regarding the transfer of an existing DCR-owned roadway accessing the site from Day Boulevard, and that this driveway may be widened as part of the development

of the site. The WRP notes that this roadway is located on filled Commonwealth tidelands and changes to it also may require c.19 authorization.

Regulatory Analysis

The proponent has indicated that a consolidated written determination (CWD) will be sought for Phase 1, which will allow the separate licensing of each building, as necessary. Chapter 91 authorization for Phase 2 is expected to be sought subsequent to Phase 1, after final MEPA review is completed. While this licensing scheme seems reasonable, the WRP believes that the proponent should demonstrate that each phase of the project and project in its entirety complies with the c. 91 regulations.

The EENF states (p. 4-5) that no buildings will be constructed within 100 feet of the current mean high water mark along the DCR parkland east of the site. In light of this fact, and since the site is located on private filled tidelands entirely separated from the adjacent shoreline, neither the setback nor use limitations in the Waterways regulations are applicable to this project. The most relevant regulatory standards are related to the density and height of the buildings on filled tidelands. As specified at 310 CMR 9.51(3)(d), one square foot of open space at the ground level of filled tidelands must be provided for every square foot of tidelands covered by the buildings for nonwater-dependent use. According to page 4-5 of the EENF, the full buildout will comply with this requirement since 44 percent of the tideland area will be covered by nonwater-dependent use buildings, leaving the remaining 66 percent as open space. The EENF also states that nonwater-dependent buildings in Phase 1 will occupy only 7 percent of the tidelands at the site. The WRP requests that the FEIR document the proportion of filled tidelands within the Phase 1 area that will be covered by the buildings to be constructed in that phase.

The Waterways regulations, at 310 CMR 9.51(3)(e), provide that buildings within 100 feet of the mean high water mark must not exceed 55 feet in height. An additional foot in height may be added for every additional two foot increment of horizontal distance from the high water mark. Therefore, the Phase 1 buildings can be quite tall by virtue of their distance from the shoreline. Based on Figures 4-4 and 4-5, it appears that the project will comply with this requirement.

Pedestrian and Parkland

Since the site does not abut the shoreline, pursuant to 310 CMR 9.52(2), it must provide pedestrian facilities that enhance connections to the waterfront. The project includes sidewalks throughout the site and provides connections to the DCR parkland east of the site. The EENF suggests that the alignment of Main Street, in particular, will connect the MBTA station with the waterfront.

While the EENF considered only a No Action Alternative, there are considerable alternative building layouts, particularly for Phase 2, that could enhance public access to, and enjoyment of, parkland at and adjacent to the site. As depicted in Figure 4-3, the Phase 2 residential buildings adjacent to the DCR park are located at the property line and appear to form a wall along the parkland that may serve to privatize this section of the park. The WRP recommends that the FEIR for Phase 2 review alternative layouts of these buildings, including greater separation between the buildings and the DCR parkland with open space provided in the

area by the project, provision of public parking between the residential buildings and DCR parkland, and other measures that will enhance the public nature and quality of the parkland.

The WRP also notes that the concern about additional vehicular traffic to the site may warrant a review of whether water transportation can play a role in the overall transportation plan.

Wastewater

The EENF states that there is sufficient capacity in the existing collection system to accommodate the estimated 158,955 gpd of additional wastewater flow from the Bayside project. The entire project is expected to generate about 200,860 gpd. Wastewater generated by the project will discharge into the Boston Water and Sewer Commission (BWSC) sewer system, which flows into the MWRA system and ultimately to the Deer Island Wastewater Treatment Facility.

As MEPA is aware, MassDEP, in cooperation with MWRA and its member communities (including Boston), are implementing a coordinated approach to flow control in the MWRA regional wastewater system, particularly the removal of extraneous clean water (e.g., infiltration/ inflow (I/I)) in the system. In this regard, MassDEP has been routinely requiring proponents proposing to add significant new wastewater flow (such as the Bayside project) to assist in the I/I reduction effort to ensure that the additional wastewater flows are offset by the removal of I/I.

Currently, DEP is using a minimum 4:1 ratio for I/I removal to new wastewater flow added. This ratio may be increased if specific flow constrictions/overflows already exist in the sewershed to which the new flow is added. The proponent should therefore work with the BWSC, and consult with MassDEP on this issue. Assuming that a 4:1 ratio is utilized, the proponent will need to remove, or cause to be removed, 635,820 gpd of I/I.

Stormwater

Stormwater runoff impacts during construction and post-construction should be evaluated in the EIR, and it should be demonstrated that source controls, pollution prevention measures, erosion and sediment controls, and the post-development drainage system will be designed in compliance with the MassDEP Stormwater Management regulations (SMR). The EENF indicates that stormwater currently discharges to Carson Beach, which is a critical area for compliance with the Stormwater Management regulations and Standard 6. However, the BWSC is planning to install a new outfall that will accept stormwater from the project and discharge it in a location away from the beach. This should be confirmed in the EIR. Alternatively, the proponent may design the stormwater management system in compliance with Standard 6, as a contingency in the event the new outfall is not available to the project timely.

Low Impact Development

The stormwater regulations require that consideration be given to low impact development (LID) and the use of integrated management practices (IMP) for control of stormwater, either alone or in combination with conventional drainage control measures. LID is an approach to stormwater management that minimizes runoff impacts by maintaining and mimicking existing hydrologic functions through site design techniques such as disconnecting

runoff flow pathways and dispersing stormwater control across the site, reducing imperviousness, and minimizing clearing and grading while preserving natural resources and drainage patterns.

Greenhouse Gas Emissions

This project requires an environmental impact report and a Massachusetts Highway Department (MHD) access permit; therefore, the project is subject to the *MEPA Greenhouse Gas Emissions Policy and Protocol.* The EENF has provided a GHG analysis. This project has been estimated to have a combined direct and indirect CO_2 reduction of about 30 percent.

At this early stage of development, there are many opportunities for designing buildings and transportation management measures that reduce energy consumption and substitute renewable energy sources for fossil fuel sources. MassDEP/EEA-DOER believes green developments are a smart financial investment. With a growing market demand for facilities that have reduced carbon footprints, rents are being driven higher for the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) certified buildings and Energy Star buildings than rents for less energy-efficient buildings, and occupancy rates are reported to be higher too by the CoStar Group[1], which released a study on rents, sales, and occupancy for energy efficient buildings in their commercial property database.

In a study from the New Buildings Institute (NBI), it was reported that building performance averages are 25-30 percent more efficient for LEED certified buildings than non-LEED buildings, and gold-platinum LEED rated buildings are 45 percent better than the national average, which approaches the interim goals of Architecture 2030, (a non-profit organization dedicated to reducing GHG emissions by changing the way developments are planned, designed, and constructed). The NBI study also shows a good correlation between modeled and actual building performance, providing assurances to developers and regulators that these measures will be effective. Additional information on energy efficiency/renewable rating systems is available at a number of websites including: http://www.buildinggreen.com/, http://energystar.gov/, www.architecture2030.org/. For new construction, core and shell, and commercial interiors relating to LEED certified buildings, information is available on the following website: http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222. In addition, for a Massachusetts perspective, consultation with green building experts can be obtained through the Green Building Roundtable: http://www.greenroundtable.org, located in Boston.

Although it is unnecessary to provide a complete technological and financial analysis of all GHG reduction mitigation measures, it will benefit the proponent to use functional and quantitative analyses and mock ups to assess feasible greenhouse gas reduction measures for the project type, starting with measures that offer the greatest energy reductions, and then considering opportunities to improve ongoing operations. These assessments should either lead to commitments to adopt the LEED and/or Energy Star elements, or the EIR should do a credible job in explaining why a particular efficiency or green power generation component is impracticable. Since there is, for example, no demonstration in the EENF that it would be

[1] The full study can be viewed at the CoStar Group Inc. website: http://www.costar.com/news/Article.aspx?id=D968F1E0DCF73712B03A099E0E99C679. CoStar Group Inc. is an information services organization serving commercial real estate in the United States and the United Kingdom.

technically infeasible or cost prohibitive to incorporate solar (photovoltaic) power on-site to generate energy for some of the building's functions, the EIR should consider the feasibility of implementing this technology.

Even if on-site power generation is not feasible, many projects now routinely commit to orienting and designing buildings for energy efficiency, and this project is commended for incorporating energy efficient lighting, Energy Star rated appliances with the lowest energy rating, and high-albedo roofing materials. Additional information and other energy efficient measures, as explained below, also need further consideration. Additional information on building design energy reduction measures and standards is available on many websites, including the following: http://www.eere.energy.gov/, http://www.nahb.org,www.sbicouncil.org, http://www.aceee.org, http://www.ashrae.org/, http://www.coolroofs.org/ and http://www.ornl.gov.

As explained in the MEPA Greenhouse Gas Emissions Policy and Protocol, the proponent's energy model must be optimized for the MA State Building Code, which is the baseline alternative for energy use in calculating GHG emissions. It should be noted that the recently passed Green Communities Act requires that the International Energy Conservation Building Code be adopted and fully integrated into the state building code and therefore the MA requirements will be changing.

Consistent with the GHG Policy the EIR also should model a mitigation alternative that would result in greater GHG reductions than the preferred alternative. Alternatives with greater energy efficiencies allow an understanding of potential opportunities for energy savings achievable by varying building design and layout strategies. Energy efficient techniques not selected should be thoughtfully explained to demonstrate that the alternative selected has avoided, minimized, and mitigated CO_2 emissions adequately. The projected reductions 30 percent in reductions of CO_2 emissions with the proposed mitigation measures from the base case is noteworthy, but appears higher than comparable projects with similar stationary and mobile source GHG mitigation measures. The EIR should provide sufficient detail to demonstrate where the GHG reductions are highest and that the designs proposed would achieve the predicted or even a higher level of GHG reduction. In particular, implementation of some of the measures described below would be appropriate.

As the project moves forward, it is recommended that the project proponent contact the New Construction division of its electric utility provider, NStar, and its natural gas provider, to take advantage of any potential rebates available for the installation of highly energy efficient equipment.

The Department of Energy Resources (DOER) has identified several measures worthy of consideration in the subsequent filing, and adoption into the project, where feasible, as detailed below. In committing to meet LEED-ND for the development, many of these measures described below can help the project proponent meet the points under Green Construction and Technology. In the event that the proponent is not able to adopt one of these measures, the subsequent filing must provide technical and cost information to document the rationale for not making a commitment to a mitigation recommendation.

Building Orientation - Table 6-7 of the EENF notes minimizing energy use through building orientation as technically infeasible. The subsequent filing needs to explain clearly how the buildings will be oriented, why that orientation was selected, and the expected impacts on energy usage.

Energy Efficient Lighting –The proponent is commended for committing to energy efficient interior lighting as described in the EENF. The proponent also commits to energy efficient exterior lighting, but no detail is provided on what will be used. The subsequent filing should provide information on the exterior lighting.

Interior Day-lighting – Table 6-7 of the EENF notes interior daylighting as inappropriate to the project. The next MEPA filing should fully consider interior daylighting for the different buildings. Interior daylighting is used in a wide variety of building types. In addition to providing energy saving benefits by reducing the need for electric lighting, interior daylighting is expected of providing health benefits as well.

Duct Insulation – The EENF notes that insulation will be wrapped around the air supply ducts to reduce energy losses. Duct insulation is the baseline required by code. To enhance efficiency, the subsequent filing should note, and construction should reflect, that all ducts will be sealed with mastic, tested and then insulated, since duct leakage can be a major factor in energy losses.

Roof and Wall Insulation - The EENF notes that roof insulation will be R-30 and the buildings walls will be R-19. The project proponent should evaluate using the highest R-value insulation possible. In general, providing the best building envelope possible provides the greatest gains in energy savings for building operations and insulation is generally very cost effective.

Windows – The EENF notes that windows will incorporate glazing. The subsequent filing should note the U-value of the windows to be used, which should be greater than code for the particular application.

Third Party Building Commissioning – Table 6-7 of the EENF notes that third party building Commissioning would be technically infeasible to the project. The EIR should fully consider building commissioning, and for it to be conducted by a third party to ensure the commissioning process is thorough and energy performance of the building is maximized. In accordance with the Green Communities Act, building code revisions will be issued that will make building commissioning required for all non-residential buildings greater than 10,000 square feet.

Lighting Motion Sensors, Climate Control and Building Energy Management Systems - Table 6 – 7 of the EENF proposes motion sensors in lighting, climate control, and tracking of the energy performance of the building, as well as development of a strategy to maintain efficiency as inappropriate to the project. Motion sensors and lighting controls should be installed in all non-residential spaces. In addition, to ensure that the energy systems function as designed long term, a strategy should be developed for monitoring energy performance of all buildings where the energy systems are centrally controlled, possible through a building management system. A building energy management system can incorporate basic energy saving measures such as

lighting and climate control. A system or strategy for monitoring energy performance would be expected to pay for itself through eliminating potential inefficient building energy operations, such as heating and cooling operating simultaneously in January.

On-site renewable energy – At a minimum, buildings should be oriented and roofs should be constructed to support the added weight of a solar photovoltaic (PV) system for potential installation during project construction or at a future date. The project proponent is to be commended for incorporating high-albedo roof materials into the project. These materials enable a rooftop PV system to operate even more efficiently, due to the added reflectivity provided by the materials. Considering the support of subsidies through the Commonwealth Solar and RPS programs, a life-cycle cost analysis should be done to evaluate the installation of a PV system during project construction under two scenarios: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party that will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. If neither of these scenarios is economically feasible at this time, the project should continue to consider the opportunity for installing PV at a future date and state their willingness to host a third-party owned PV array under a favorable power purchase agreement. The following website provides information on the Commonwealth Solar program and tools for performing basic life cycle cost analyses: http://www.masstech.org/renewableenergy/commonwealth_solar/index.html#

In addition, solar thermal is another potential way to incorporate renewable energy. If the buildings will be using a steady 24/7 hot water load, solar thermal could potentially offset the hot water load for the building.

Assess District Heating and Cooling for Development – The site is well-suited for a district energy system. As a new, clustered, mixed-use development, the project meets some of the basic screening criteria for district heating and cooling, potentially in combination with combined heat and power (CHP) to also serve the electric load. A centralized heating and cooling plant can provide hot and chilled water through distribution pipes to serve the full thermal and hot water loads of the entire development. This approach has been shown to significantly reduce the GHG emissions compared to individual boilers/chillers in each building or residential unit, and provides additional benefits in terms of operations and maintenance, fuel flexibility, and increased usable building space. The central thermal plant might be fueled by natural gas, biomass or geothermal. The project proponents should evaluate this energy approach for its GHG emission benefits and economic feasibility. If a central plant is not feasible, the proponent should evaluate for CHP for individual buildings that have a 24/7 load, such as the hotel. The following websites are recommended for additional information on feasibility and life-cycle costs analyses relating to district energy systems as well as CHP: the International District Energy Association (IDEA), www.districtenergy.org., the USEPA Combined Heat and Power Application Center, http://www.epa.gov/chp, and RETScreen® International http://www.retscreen.net/ang/home.php.

If a district heating and cooling system is not feasible, the EIR needs to provide more information regarding the HVAC systems for all the individual building types. The proponent is commended for installing boilers/furnaces with a high efficiency of 95 percent. However, without more information on the HVAC systems, it is not possible to evaluate whether or not the

systems being proposed are highly efficient for the application based on an Energy Efficiency Ratio (EER) of 11.5. Although there is a potential for additional first costs with highly efficient systems, more efficient units provide definite economic benefits over the life of the system.

Although the main sources of GHG associated with this proposed project include building heating and cooling, lighting, and vehicle travel to and from the proposed development, the energy required to provide potable water and treat wastewater also will be a source of GHG. To gain an understating of the correlation between water/wastewater volumes and energy use requirements, MassDEP has considered major utilities in the state and reviewed relevant research. For example, the Massachusetts Water Resources Authority (MWRA) estimates the average energy cost wastewater treatment at their Deer Island facility is 1.2 - 1.4 kWh/kgal. Similarly, a study of wastewater treatment plants in Wisconsin found that 1.5 kWh/kgal was required to treat wastewater in that state's wastewater treatment plants. This proposed development will generate approximately 158,955 gallons of additional wastewater per day or approximately 58,018,575 million gallons per year. Using an average energy cost of 1.3 kWh/kgal the project will require approximately 75,424 kWh over the course of a year. The project proponent should consider this additional energy use when proposing measures to mitigate the additional GHG emissions that will result from treating wastewater from this proposed project.

The MWRA estimates that treating and transporting drinking water at their John Carrol Water Treatment Plant requires 0.14 to 0.23 kWh/kgal. As noted in the EENF, the proposed project will require 680,536 gallons of additional potable water per day, or 248,395,640 gallons per year. Using energy costs of about 0.2 kWh/kgal; approximately 49,679 kWh will be required to supply the proposed project with potable water annually. As with wastewater, the project proponent should consider this additional energy use when proposing measures to mitigate the additional GHG emissions that will result from providing potable water for this proposed project.

The EENF indicates that the project would be providing low-flow toilets and restricted flow shower heads. MassDEP requests that the proponent consider additional measures to reduce water demand, and the associated energy needed to process that water and wastewater, and demonstrate that water conservation would reduce water use to the greatest extent. The USEPA's WaterSense program includes specifications for water conservation measures that may be adaptable to this mixed-use project. For example, a minimum of R4 insulation is required for hot water pipes and there are criteria for the delivery system designs that optimize water and energy use. WaterSense, USEPA's water efficiency equivalent to EnergyStar is seeking at least 20 percent greater water efficiency for single-family homes in its pilot program, which will release its results early next year.

In addition to water conservation, off-site mitigation measures for water and wastewater may include improvements to the distribution systems for the public water supply to eliminate un-accounted for water losses and infiltration and inflow (I/I) removal from sewer mains.

Summarizing, the EIR needs to show that the preferred alternative would achieve significant reductions in GHG emissions with building designs, selection of building materials, and water and sewer infrastructure upgrades and efficiencies that reduce and/or offset the fossil fuel energy demand of the project. Revised GHG emissions modeling for this project should

include for reconsideration the mitigation measures identified herein, in order to quantify the additional emissions reductions that are potentially achievable. In the event that the proponent is not able to adopt any of these measures, the EIR should provide technical and cost analyses to document the rationale for not making a commitment to a mitigation recommendation.

Construction and Demolition Waste Reduction

The project includes demolition and reconstruction, which will generate a significant amount of construction and demolition (C&D) waste. Although the EENF has not made a commitment to recycling construction debris, MassDEP requires C&D recycling activities to be incorporated as a sustainable measure for the project.

The project proponent is advised that demolition activities must comply with both Solid Waste and Air Pollution Control regulations, pursuant to M.G.L. Chapter 40, Section 54, which provides:

> Every city or town shall require, as a condition of issuing a building permit or license for the demolition, renovation, rehabilitation or other alteration of a building or structure, that the debris resulting from such demolition, renovation, rehabilitation or alteration be disposed of in a properly licensed solid waste disposal facility, as defined by Section one hundred and fifty A of Chapter one hundred and eleven. Any such permit or license shall indicate the location of the facility at which the debris is to be disposed. If for any reason, the debris will not be disposed as indicated, the permittee or licensee shall notify the issuing authority as to the location where the debris will be disposed. The issuing authority shall amend the permit or license to so indicate.

For purposes of implementing the requirements of M.G.L. Chapter 40, Section 54, MassDEP considers an asphalt, brick, and concrete (ABC) rubble processing or recycling facility, pursuant to the provisions of section (3) of 310 CMR 16.05 Site Assignment Regulations for Solid Waste Management Facilities, to be conditionally exempt from the site assignment requirements if the ABC rubble at such facilities is separated at the point of generation from other solid waste materials. Under 310 CMR 16.05(3), ABC can be crushed on-site with just a 30-day notification to MassDEP. However, the asphalt is limited to weathered bituminous concrete (no roofing asphalt) and the brick and concrete must be uncoated or not impregnated with materials such as roofing epoxy. If the brick and concrete are not clean, e.g., coated and/or impregnated, the material is defined as construction and demolition (C&D) waste and requires either a Beneficial Use Determination (BUD) or a Site Assignment and permit before it can be crushed.

Pursuant to the requirements of 310 CMR 7.02 of the Air Pollution Control Regulations, if the ABC crushing activities are projected to result in the emission of one ton or more of particulate matter to the ambient air per year and/or if the crushing equipment employs a diesel oil fired engine with an energy input capacity of three million or more British thermal units per hour for either mechanical or electrical power which will remain on-site for twelve or more months, then a plan application must be submitted to MassDEP for written approval prior to installation and operation of the crushing equipment.

In addition, if it appears that significant portions of the demolition project contain asbestos, the project proponent is advised that asbestos and asbestos-containing waste material are a special waste as defined in the Solid Waste Management regulations (310 CMR 19.061). Asbestos removal notification on permit form ANF 001 and building demolition notification on permit form AQ06 must be submitted to MassDEP at least 10 working days prior to initiating work. Except for vinyl asbestos tile (VAT) and asphaltic-asbestos felt and shingles, the disposal of asbestos containing materials within the Commonwealth must be at a facility specifically approved by MassDEP (310 CMR 19.061). No asbestos containing material including VAT, and/or asphaltic-asbestos felts or shingles may be disposed at a facility operating as a recycling facility, (310 CMR 16.05). The disposal of the asbestos containing materials outside the jurisdictional boundaries of the Commonwealth must comply with all the applicable laws and regulations of the state receiving the material.

The demolition activity also must conform to current Massachusetts Air Pollution Control Regulations governing nuisance conditions at 310 CMR 7.01, 7.09 and 7.10. As such, the proponent should propose measures to alleviate dust, noise, and odor nuisance conditions, which may occur during the demolition. MassDEP must be notified in writing, at least 10 days in advance of removing any asbestos. MassDEP also must be notified in writing, at least 10 days prior to any demolition work. The removal of asbestos from the buildings must adhere to the special safeguards defined in the Air Pollution Control Regulations (310 CMR 7.15 (2)).

Materials Management

In order to address GHG emissions related to materials management in the EIR, MassDEP requests that the applicant quantify the GHG impacts of materials management for the project development and projected future operation. By quantifying these impacts, the applicant's GHG mitigation efforts related to materials management can be more clearly identified and targeted appropriately. MassDEP seeks quantification to help guide changes in the project, which provide a comprehensive approach to materials management throughout the design, construction, and operational phases of the project. There are a number of resources available to help quantify GHG impacts associated with efficient materials management, including the USEPA Warm Model, available at the following website: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html, and the Building Reuse Calculator at: http://www.wastematch.org/calculator/calculator.htm.

During the **design phase**, MassDEP requests the applicant address waste reduction, environmentally preferable materials use, and the need to design for the storage and collection of recyclables. In order to plan for waste reduction, the applicant should consider implementing a waste prevention purchasing policy, which may include management options for reducing shipping and packaging materials, and if necessary, managing excess materials through unused product return or donation.

MassDEP also requests that the EIR provide the following information:

- a list of the environmentally preferred products to be used,
- the GHG impacts of using these materials, and

- an explanation for why an expanded commitment to use additional EPP materials (including on-site use of demolition materials, regionally produced materials, recycled content materials) is not applicable or cannot be confirmed.

MassDEP requests that more specific information be provided on the square footage of the proposed storage area and the types of materials expected to be stored and recycled. The EIR should, at a minimum, demonstrate that the storage area would be sufficient to manage waste materials currently prohibited from disposal in Massachusetts. A list of these materials can be found on the MassDEP website: http://www.mass.gov/dep/recycle/solid/regs0201.htm. In addition, MassDEP requests that the applicant identify how hazardous materials generated during facilities' operations, e.g., spent fluorescent bulbs, lubricants, waste oil, and other hazardous materials, would be managed and stored.

During the **construction phase**, MassDEP recommends that the applicant's material management efforts focus on material reuse and recycling. MassDEP requests the applicant commit to developing a construction waste management plan that fully complies with the Massachusetts Waste Bans and establishes a minimum reuse/recycling goal of 50 percent. The Department has demonstrated through pilot construction projects that this planning results in significant reductions in waste and cost savings for developers. Information and resources to assist in the development and implementation of a construction management plan can be found at http://www.mass.gov/dep/recycle/reduce/managing.htm#project.

In the **operations phase,** the applicant should develop and implement a waste management plan to ensure compliance with the MassDEP Waste Bans. The Department offers resources to assist in this area including planning tools, contracting language, and lists of service providers (http://www.mass.gov/dep/recycle/reduce/assistan.htm#reduce). The waste management plan should establish a target-recycling goal of more than 50 percent. This level of recycling has been achieved consistently in similar projects with demonstrated operational cost savings and capital asset appreciation benefits.

Air Quality

According to the EENF listed on the Environmental Monitor website, the project will draw 8,040 new vehicle trips, adjusted for transit, bicycle, and pedestrian trips to the project on Saturdays once construction is completed. However, Transportation Chapter 5 indicates that in Phase II of the project, an additional 2,725 vehicle trips (adjusted) will be generated, for a total of 10,765 adjusted Saturday vehicle trips. Unadjusted for the alternative mode trips, the expected number of Saturday vehicle trips to the project would be 26,210 over the two development phases. (Adjusted weekday trips are 9,120 for the two phases; unadjusted, weekday trips are 21,560.) The Environmental Monitor listing of the project should have reflected the unadjusted vehicle trip numbers to show the potential emissions impact of the project.

Due to the high number of trips and expected air emission impacts, MassDEP believes that the project proponent, Corcoran-Jennison Companies must implement a number of measures to reduce these impacts and comply with several air quality regulations and policies. MassDEP also recommends that the project proponent implement a number of incentives to reduce trips to the proposed site.

Requirements

Mesoscale Analysis

MassDEP acknowledges the effort and commitment to air quality the project proponent made in conducting a mesoscale analysis, which is used to determine whether and to what extent the proposed project will increase the amount of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the project area. The mesoscale analysis also is used to determine if the project will be consistent with the Massachusetts State Implementation Plan (SIP).

Unfortunately, MassDEP believes that the use of 11,485 projected weekday vehicle trips and 11,805 projected Saturday vehicle trips in the 2013 Build Year, as noted on page 6-6 of the EENF, is unacceptable and underestimates the potential emissions impact of the project.

There are three issues associated with the use of these numbers: 1) the origin of the vehicle trip numbers used to conduct the mesoscale analysis, 2) the apparent use of adjusted trips, and 3) the use of adjusted trips from Phase I alone. First, it is unclear as to how the vehicle trip numbers were developed. The discussion on the mesoscale analysis states that the vehicle trips represent adjusted data from Phase I and account for a 0.25 percent annual growth in background traffic from 2008 (p. 6-6). Using the adjusted weekly trip numbers (6,710 trips) for Phase I from Table 5-17 (p. 5-41), and adding a 0.25 percent increase does not add up to 11,485 projected vehicle trips.

Second, Chapter 5 (p. 5-35), cites 15,930 unadjusted projected trips on a weekday and 19,530 unadjusted projected trips on a Saturday under Phase 1 in 2013. MassDEP believes that the difference between the 11,485 projected adjusted weekday trips and 15,930 unadjusted trips is too substantial to base an emissions analysis on the lower number; the same is true for the projected Saturday trips. The project proponent assumes a high transit share to the project; however, the use of transit will most likely be undermined by the number of parking spaces offered at the project — a number which is more in line with a suburban project with no access to transit (see "Reduced Number of Parking Spaces" below for a discussion of the parking supply).

Third, the project proponent has used vehicle trip data for Phase I alone for the mesoscale analysis. Mesoscale analyses should be conducted for the full projected vehicle trips to a proposed project. MassDEP therefore requests that the project proponent conduct another mesoscale analysis using the unadjusted number of projected vehicle trips for Phase I and Phase II, cited on pages 5-35 and 5-36 (21,560 weekday vehicle trips and 26,210 Saturday vehicle trips) and present the new data in the EIR.

Greenhouse Gas Emissions Mobile Sources

MassDEP commends the developer for conducting a greenhouse gas (GHG) emissions analysis. However, because the project proponent used the same number of vehicle trips to estimate GHG emissions as those used to estimate VOC and NOx emissions, the analysis is again appears to underestimate impacts. MassDEP requests that the project proponent analyze the project for GHG emissions using the unadjusted number of projected vehicle trips for Phase I

and Phase II, cited on pages 5-35 and 5-36 (21,560 weekday vehicle trips and 26,210 Saturday vehicle trips) and present the data in the EIR.

Recommendations

Construction Period Air Quality Mitigation Measures

MassDEP recognizes that the project proponent is willing to implement mitigation measures to reduce emissions from construction equipment engines used on the site. Diesel emissions from construction equipment engines contain fine particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), which has been found to exacerbate a number of heath conditions, such as asthma and respiratory ailments. $PM_{2.5}$ also contributes to lung damage and has been identified as a likely carcinogen.

MassDEP requests that the project proponent explain in detail in the EIR the measures that will be implemented to reduce construction-period diesel emission mitigation. Current options to reduce the emissions include the installation of after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). For more information see MassDEP's Diesel Engine Retrofits in the Construction Industry: A How To Guide at http://www.mass.gov/dep/air/diesel/conretro.pdf

In addition, MassDEP recommends that the project proponent use ultra low sulfur diesel (ULSD) fuel. ULSD fuel has a sulfur content of approximately 15 parts per million (ppm) in contrast to the 500 ppm sulfur level of current off-road diesel fuel recently required by the U.S. Environmental Protection Agency (EPA). The use of ULSD fuel, in conjunction with after-engine emission controls, can reduce additional amounts of $PM_{2.5}$.

Transportation Demand Management (TDM) Measures

MassDEP acknowledges the TDM measures the project proponent has committed to implement. To further demonstrate this commitment, MassDEP requests that the project proponent indicate in the EIR the number of spaces designated for use under the following measures: 1) Reserve parking to encourage ridesharing/carpooling and 2) Require parking space users to directly pay for parking.

Furthermore, MassDEP recommends that the project proponent implement the following additional incentives to reduce vehicle trips of employees and shoppers (the Rideshare Regulation requires some of these measures). The EIR should discuss in detail the implementation of the following measures at the project:

- Reduced Number of Parking Spaces. The project proponent maintains that this project will only result in a four percent increase in the number of parking spaces over the number of spaces currently existing at the site. This analysis is in error. The project proponent maintains that the existing project contains 2,689 parking spaces, *including* 500 spaces located at a satellite parking parcel which are not going to be developed under the proposed project. A more appropriate analysis is to compare the proposed number of parking spaces (2,805 spaces) to the existing number of spaces *excluding* the satellite parking spaces (2,189 parking spaces). Therefore, based on this number, the project

results in a net increase of 616 parking spaces—a 28 percent increase over the existing supply at the project site.

This is a particularly large and unnecessary increase, given the generous supply of transit facilities in the area. At Full Build, with 21,560 projected weekday vehicle trips and 2,805 parking spaces, the vehicle use per space will be a 7.6 ratio over the course of a day. This ratio is substantially lower than suburban development projects that have no access to transit, (a ratio of 12 trips per parking space for a proposed site in Wilmington, for example) and will most likely reduce the incentive for patrons to use public transit to the project.

Research indicates that limiting the parking supply of a project is one of the best means to reduce vehicle trips to a site. MassDEP therefore recommends that the project proponent reduce the number of parking spaces by a significant amount to reduce vehicle trips and promote public transit use. For this project which has a proportionate amount of dedicated parking for the supermarket and residential components, the best spaces to reduce would be the shared parking spaces.

MassDEP also requests that the developer provide an explanation and data citations in the Single EIR as to the basis for the projected need for the additional parking spaces.

- Additional Walking Incentives - In addition to the measures cited by the project proponent, MassDEP recommends that the proponent install benches throughout the project to promote pedestrian use of the project.

- Additional Bicycle Incentives - To promote bicycling to the site, MassDEP recommends that the proponent also install employee locker and shower facilities, and other enhancements, (e.g., bicycle helmets, coupons to bike stores, and bike locks).

- Traffic Calming Measures - Traffic calming measures in excess of jurisdiction requirements reduce motor vehicle speed and encourage bicycle and pedestrian trips. All sidewalks within or adjacent to a project should be a minimum of 5 foot wide with vertical curbing and avoid acute angle intersections. All intersections within or adjacent to a project should also incorporate curb extensions, raised crosswalks, and raised intersections. Median islands, tight corner radii, and round-abouts also are recommended. Streets internal and adjacent to the project also should feature safety/traffic calming measures such as planter strips, street trees and chicanes (variations in road width) to discourage high-speed travel and increase pedestrian use.

Air Quality- Emergency Generator

The project proponent is advised that pre-installation approval from the MassDEP Division of Air Quality Control is needed if the project will include the installation of any Fuel Utilization Facility that emits air contaminants, (e.g., furnaces, fuel burning equipment, boiler(s)) sized above the de minimus threshold levels in 310 CMR 7.02. In addition, if the building is to be equipped

with emergency generators, additional review by the Department may be required depending on the size of the generator units. An emergency generator with an energy input capacity of less than 3 million BTU per hour is exempt from the requirements of 310 CMR 7.02. An emergency generator with an energy input capacity of more than 10 million BTU per hour requires pre-installation approval from the Department. A generator with a capacity between 3 million and 10 million BTU per hour must either follow the work practices in 310 CMR 7.03 or receive pre-installation approval under 310 CMR 7.02.

Massachusetts Contingency Plan (MCP)/M.G.L. Chapter 21E

Although the Department is not aware of any confirmed active 21E sites onsite, if any of the development occurs in the general vicinity of a gas station or other business where hazardous materials have been used or stored over a period of time (auto repair shop, electro-plating operation, etc.), there is a likelihood that localized soil contamination has occurred. If applicable, the location of these sites should be carefully reviewed prior to commencing the project. The project proponent is advised that removing and disposing of contaminated soil, pumping of contaminated groundwater, or working in contaminated media must be done under the provisions of MGL c.21E/21C and OSHA. Failure to obtain the necessary permits under these provisions beforehand may result in considerable delay of the project as well as administrative penalties.

The MassDEP and EEA-DOER appreciate the opportunity to comment on this proposed project. Please contact the staff listed for further information on the issues. If you have further questions on GHG issues, the MassDEP contact is Philip.Weinberg@state.us, (617) 292-5972, and the DOER contact is Meg.Lusardi@state.ma.us, (617) 727-4732 X40164. Please get in touch with Jack Zajac (978) 694-3240 for further information on the wastewater issues, and should you have any questions about the comments in this letter regarding the mesoscale analysis or mobile source GHG, please contact Susan Lyon at 617-556-1101. For any general questions regarding these comments, contact Nancy.Baker@state.ma.us, MEPA Review Coordinator at (978) 694-3338.

Sincerely,

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Phil Weinberg, Nancy Seidman, Christine Kirby, Richard Blanchet, Susan Lyon, Alex Strysky, Alissa Bilfield, MassDEP Boston
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August 22, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Bayside Development
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 14273
PROJECT PROPONENT	: Corcoran Jennison Companies
DATE NOTICED IN MONITOR	: July 9, 2008

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62I) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of a mandatory Environmental Impact Report (EIR). In a separate Certificate issued today I have established a Special Review Procedure (SRP) to guide the review of this project.

Project Description

As described in the Expanded Environmental Notification Form (EENF), the project consists of the redevelopment of the Bayside Exposition Center site into a mixed-use development. The project will retain the existing office and hotel buildings on the 27.8-acre site and the existing Bayside Exposition Center will be demolished. The first phase of development (Phase I) will include: the redevelopment of the Bayside Office buildings to include ground floor retail, expansion (78 rooms) of the Double Tree Hotel, 300 dwelling units above ground floor

retail, 250,000 gross square feet (gsf) of retail/restaurants, 105,000 gsf of office above ground floor retail, a total of 1,884 parking spaces and three new parking garages. The second phase of the project (Phase II) will include approximately 650 residential units in as many as six buildings. The project will include intersection improvements to accommodate vehicular and pedestrian traffic, as well as overall site landscaping and stormwater management improvements.

Anticipated environmental impacts outlined in the EENF include a reduction of on-site impervious area by 3.6 acres, an increase of 8,380 vehicle trips per day to a site total of 11,575 vehicle trips per day, a reduction in total parking spaces by 411 to 1,884, an increase in water use by 174,850 gallons per day (GPD) for a total of 220,946 GPD, and an increase in wastewater generation by 158,955 GPD for a site total of 200,860. The project site contains approximately 10.8 acres of filled private tidelands subject to Chapter 91 (c.91) and its implementing regulations (310 CMR 9.00). The project site is adjacent to Department of Conservation and Recreation (DCR) beaches, parklands, and roadways.

Jurisdiction and Permitting

This project is subject to MEPA review and the preparation of a mandatory EIR because it requires a State agency action and exceeds several MEPA thresholds. The project will result in the conversion of land held for natural resource purposes in accordance with Article 97 (301 CMR 11.03(1)(b)(3)), the discharge of more than 100,000 gallons per day (GPD) of wastewater (301 CMR 11.03(5)(b)(2)), the construction of more than 0.5 miles of new sewer mains outside of an existing roadway (301 CMR 11.03(5)(b)(3)(c)), the construction of a nonwater-dependent use on more than one acre of tidelands (301 CMR 11.03(3)(a)(5)), and will generate 3,000 or more new average daily trips on roadways providing access to a single location (301 CMR 11.03(6)(a)(6)). The project will require an Access Permit from DCR for impact to DCR-controlled roadways. The project will also require a land transfer from DCR. A c.91 License and a Sewer Connection/Extension Permit will be required from the Massachusetts Department of Environmental Protection (MassDEP). The project must obtain an 8(m) permit from the Massachusetts Water Resources Authority (MWRA). Coverage under the National Pollutant Discharge Elimination System (NPDES) Construction General Permit from the U.S. Environmental Protection Agency (U.S. EPA) will be required. The project may be subject to Coastal Zone Management federal consistency review. The project must obtain an Order of Conditions from the Boston Conservation Commission, or in the case of an appeal, a Superseding Order of Conditions from MassDEP. Numerous other approvals from the City of Boston (including Article 80) will also be required. The project is subject to the EEA/MEPA Greenhouse Gas (GHG) Emissions Policy.

The ENF indicated that the project may receive financial assistance for infrastructure improvements and will require a c.91 License. Therefore, MEPA jurisdiction is broad in scope and extends all aspects of the project with the potential to cause Damage to the Environment as defined in the MEPA regulations.

Request for Single EIR and SRP

In accordance with Sections 11.05(7) and 11.09 of the MEPA regulations, the proponent has submitted an Expanded ENF with a request that I allow the proponent to fulfill its EIR obligations under MEPA for Phase I of the project with a Single EIR, rather than require the usual two-step Draft and Final EIR process, and to establish a SRP for evaluating Phase II of the project. The Expanded ENF and request for a SRP received an extended public comment period pursuant to Section 11.06(1) of the MEPA regulations. I have reviewed the proponent's request for a Single EIR in accordance with Section 11.06(8) of the MEPA regulations, and I hereby find that the Expanded ENF meets the regulatory standards. As noted above, I have also issued a separate Certificate establishing a Special Review Procedure (SRP). Pursuant to the Certificate establishing the SRP, the Proponent must file a Notice of Project Change (NPC) describing the potential cumulative environmental impacts of the Full Build phase of the Project (Phase I and Phase II combined) prior to commencement of any portions of the Phase II development. I will then issue a Certificate on the NPC that outlines a Scope for a Full Build Single EIR for the Full Build of the project. In consideration of the above, I will allow the proponent to prepare a Single EIR for Phase I of the project in fulfillment of the requirements of Section 11.07 of the MEPA regulations.

I acknowledge the proponent's efforts in developing the EENF, which contained information that has been particularly helpful in understanding the project and potential project impacts on tidelands and transportation infrastructure. While I am allowing the proponent to prepare a Single EIR for Phase I of the project, several items have been identified in comments on the EENF that must be addressed in detail in the Single EIR. I retain my authority to require further review in the form of a Supplemental Single Environmental Impact Report if issues outlined in this Scope and in comments are not thoroughly addressed in the Single EIR. The proponent may, if they so choose, file a joint Project Impact Report (PIR) and Single EIR with both the BRA and MEPA, responding collectively to the separate scopes issued by each agency.

SCOPE

General

The Single EIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this scope.

Project Description and Permitting

The Single EIR should include a detailed description of the proposed project and describe any changes to the project since the filing of the EENF. Within the EENF summary form it was unclear if the total impact calculations provided were for the first phase of development (Phase I) or the overall development program (Phase I and Phase II). The Single EIR should provide clear calculations of environmental impacts associated with the first phase of the project and provide a

conceptual estimate of cumulative project impacts associated with Full Build condition (based upon the building program presented in the EENF). The Single EIR should provide a brief description and analysis of applicable statutory and regulatory standards and requirements, and a description of how the project will meet those standards. The Single EIR should include a list of required permits and approvals and provide an update on the status of each permit and/or approval.

Alternatives

The project will alter the existing conditions of the project site through the construction of this mixed-use development. The project provides an opportunity to redevelop the exhibition center, hotel and office area into a vibrant mixed-use community with increased open space and transit oriented features.

The Single EIR should analyze the following alternatives:

- A No-Build Alternative;
- A Modified Entry Alternative that removes the use of North Site Drive as a project site entry point;
- A Modified Preferred Alternative that accommodates a public roadway that separates the buildings on the project site and DCR's West Link Park; and
- A Preferred Alternative.

The Single EIR must also include a summary (and associated supporting graphics) of previously considered design alternatives that were discarded during the Columbia Point master planning process or other neighborhood design meetings. These previously discarded conceptual design plans should be presented in the Single EIR to support the proponent's conclusion that the Preferred Alternative avoids, minimizes, and mitigates damage to the environment.

It is possible that, subsequent to the completion of the alternatives analysis, the Preferred Alternative could be modified in comparison to that presented in the EENF. The Single EIR should identify the impacts for each of the alternatives on land alteration (including impervious area), tidelands, traffic, parking, drainage, and wastewater in a tabular format. This table, along with a supporting narrative and conceptual site plans, should provide a comparative analysis that clearly shows the differences between the environmental impacts associated with each of the alternatives. The Single EIR should specifically address how each alternative will not preclude the Proponent from meeting the necessary mitigation measures associated with required State agency actions (e.g., c.91 license, land transfers, etc.) for the Phase II development. I encourage the Proponent to use the guidance provided in State Agency comment letters that refer to Phase II design and layout to assist in meeting the aforementioned directive. Phase I alternatives should not prevent Phase II from avoiding, minimizing or mitigating damage to the environment, both as a discrete phase or when considering the project's cumulative impacts.

The Single EIR should identify and explain any project phasing, including potential impacts on construction sequencing and traffic patterns. The Single EIR should provide an update on the Columbia Point Master Plan and the project's consistency with plan goals.

Land

The project is located proximate to numerous DCR properties. The project is bounded by DCR's Old Harbor Reservation that includes Carson Beach, Mother's Rest, Old Harbor Park, and West Link Park. Vehicular access to the site is provided in part via DCR's William J. Day Boulevard (Day Boulevard) from a leased access road (North Site Drive) that crosses DCR property. The project will require an Article 97 disposition of land to 1) convey a proposed easement (to replace the existing temporary lease) and 2) to realign the North Site Drive across DCR property.

The Single EIR should identify existing Article 97 lands adjacent to the project site, ownership of the parcels, and the boundaries of the areas proposed for transfer. The Single EIR should provide an analysis of the project's compliance with the Executive Office of Energy and Environmental Affairs' (EEA) Article 97 Land Disposition Policy. As requested by DCR, this analysis should include: 1) an assessment of the feasibility of the project absent any disposition of DCR real property interests, 2) an assessment of the value in use of the easement as it contributes to the project as a whole, and 3) the means by which the Proponent will address the no-net loss of open space requirement of the Land Disposition Policy.

DCR has noted an apparent lack of neighborhood open space provided on-site for the Phase I development. The Boston Parks and Recreation Department (BPRD) has expressed similar concerns regarding usable passive and active open space given potential increases in neighborhood populations. I anticipate that the Proponent will prepare an open space impact assessment as required by the BPRD for large-scale development projects. In the Single EIR the proponent should explore and incorporate into the Preferred Alternative additional quality active recreation space, tot lots, playgrounds, or other community facilities on-site and evaluate ways to integrate open space and public areas into the site design. The Proponent must ensure that the Phase I development will not preclude the ability of the project to meet City open space requirements during the Full Build condition. I encourage the Proponent to meet with the BPRD to discuss ways to meet City goals, needs, and guidelines with regard to open space in a manner commensurate with project impacts.

The Single EIR should include details regarding site grading and potential impact to DCR property. In particular, estimates on the amount of fill to raise the project site elevation, connections to existing off-site grades and potential impacts to adjacent off-site drainage.

Traffic and Transportation

The EENF included a traffic study that evaluated the estimated traffic trip generation associated with the Phase I build condition and the Full Build condition. The project site is

located proximate to existing bus, light rail and commuter rail stations and a portion of traffic trips to and from the site are expected to be diverted to public transportation. The EENF traffic and transportation study also evaluated pedestrian movements within the corridor. The Boston Transportation Department (BTD), the Massachusetts Highway Department (MassHighway) and DCR all have jurisdiction over some part of the traffic study area. DCR has custody and control of several roadways in the immediate vicinity of the project, including Morrissey Boulevard, Day Boulevard, Columbia Road and Kosciuszko Circle. Proposed intersection improvements in associated with mitigation efforts are limited to DCR and BTD roadways.

New traffic trips on the roadway system attributable to the project were determined after internal trips, transit and pedestrian trips, pass-by and diverted link trips were subtracted. The EENF estimates Phase I impacts to be approximately 6,710 new primary auto trips on a daily weekday and approximately 8,040 new primary auto trips on a daily Saturday. The EENF indicates that the Phase II development will add an additional 2,725 vehicle trips (adjusted). Therefore, the Full-Build condition, as presented in the EENF will generate approximately 9,120 new vehicle trips on a weekday and 10,765 new vehicle trips on a Saturday, when adjusted for internal trips, transit trips, etc. Unadjusted traffic trips are estimated at 21,560 new vehicle trips on a weekday and 26,210 new vehicle trips on a Saturday.

The Single EIR should include a revised and updated traffic study prepared in conformance with EOEEA/EOTPW Guidelines. In addition to a general response to comments, the Proponent shall provide a detailed response to the Traffic subsection of the comment letter dated August 15, 2008 submitted by DCR, and I hereby incorporate by reference the additional requests for information contained in that letter as part of the scope of the Single EIR. The updated traffic study should reflect the guidance provided in this DCR comment letter. The Single EIR should explicitly address how the project will accommodate bicycle and pedestrian traffic, including safety precautions and promotion of bicycle or pedestrian use through site design or other incentives. The Single EIR should include an updated Transportation Demand Management (TDM) plan that includes commitments to TDM measures to reduce overall vehicle trips to the project site.

The Single EIR should include conceptual plans for the proposed roadway improvements that should be sufficient detailed to verify the feasibility of constructing such improvements. The conceptual plans should clearly show proposed lane widths and offsets, layout lines and jurisdictions, and the land uses (including access drives) adjacent to areas where improvements are proposed. The Single EIR should identify how each roadway improvement is consistent with applicable design and performance standards based upon roadway jurisdiction. Provisions for pedestrian and bicycle accommodations should be depicted on the conceptual plans, including those located on internal project roadways.

The project will contribute to an anticipated increased density in the Columbia Point neighborhood. The Single EIR should investigate the viability of providing an appropriately scaled on-site water transportation facility as a means to reduce vehicle traffic trips. If this is not feasible, I encourage the Proponent to work with local stakeholders to identify other appropriate water transportation enhancements in the Columbia Point neighborhood.

Parking

The EENF indicated that under existing conditions, the project site contains a total of 2,189 parking spaces. The site will contain a total of 1,884 total parking spaces during Phase I development, a reduction of 305 spaces from existing conditions. The EENF estimated that an additional 921 parking spaces will be added in Phase II, for a Full Build parking total of 2,805 parking spaces. I have received several comments expressing concern regarding the large number of parking spaces provided in the development program and the potential to promote vehicle trips to the site in lieu of viable public transportation, bicycle or pedestrian modes. The Single EIR should provide parking space/use ratio data, required parking minimums in accordance with City of Boston zoning, and projected need data to determine how the amount of proposed parking spaces were derived. The Single EIR should outline a Parking Demand Management plan, including parking spaces dedicated to ridesharing/carpooling, fee structures (if any), or other incentives that may be implemented to reduce vehicle trips to the project site and use of parking. Integral to a Parking Demand Management program is data to determine the number of users and overall parking behaviors; I strongly encourage the Proponent to prepare a draft parking monitoring plan for inclusion in the Single EIR.

Air Quality

The EENF included a mesoscale analysis for the Phase I portion of the project. Mesoscale emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) were calculated for four scenarios: 2008 Existing, 2013 No-Build, 2013-Build, and 2013 Build with Mitigation. The analysis used the U.S. EPA MOBILE6.2 Mobile Source Emission Factor Model, and followed protocol approved by MassDEP. MassDEP has indicated that due to the high number of vehicle trips and expected air emission impacts, the Proponent must implement a number of measures to reduce these impacts and comply with air quality regulations and policies.

MassDEP has concluded that the estimated vehicle trips used in the EENF mesoscale analysis may underestimate the potential emission impact of the project. MassDEP has identified three key issues pertaining to the mesoscale analysis: 1) the origin of the vehicle trip numbers used for the analysis, 2) the apparent use of adjusted trips in the analysis, and 3) the use of adjusted trips from Phase I alone. As part of the Single EIR, the Proponent should provide a revised mesoscale analysis prepared in accordance with MassDEP standards that considers impacts from both the Phase I and Full Build condition. The proponent should consult with MassDEP prior to undertaking an updated study to confirm that appropriate assumptions are made and suitable mitigation measures (i.e. incentives to reduce trips to the project site) are proposed.

Greenhouse Gas Emissions (GHG)

The proposed project is subject to EEA's Greenhouse Gas (GHG) Emissions Policy and Protocol which requires that proponents quantify project-related GHG emissions and propose

and quantify the impact of mitigation measures to reduce GHG emissions. A copy of the GHG Emissions Policy and Protocol may be found at: http://www.mass.gov/envir/mepa/pdffiles/misc/GHG%20Policy%20FINAL.pdf.

The EENF included an analysis of potential GHG emissions associated with Phase I of the project. The GHG Policy requires that Proponents quantify GHG emissions for a baseline scenario, a build scenario, and a build with mitigation scenario. I note that in the EENF, the Proponent presented the Build with Mitigation scenario as the Preferred Alternative.

The Single EIR should reflect a commitment to pursue additional GHG mitigation measures. The recent enactment of comprehensive energy reform and economy-wide greenhouse gas regulatory mandates in Massachusetts is a clear indication that the Commonwealth understands the risks posed by global climate change and is committed to ensuring that Massachusetts does its part to reduce its greenhouse gas emissions. This law will require that the Commonwealth quantify all sources of GHG emissions and take effective steps to minimize contributions from each sector. Because this project will be phased over many years, the proponent should anticipate that future phases of the project may be subject to requirements to reduce GHG emissions consistent with the new legislation. In view of the foregoing, I am convinced that the proponent will honor its commitment to sustainability with a more detailed description of measures it will implement to reduce GHG emissions in the Single EIR and consider establishing a target for reductions in project-wide GHG emissions that will be achieved for each phase.

The Proponent has shown a 30 percent reduction in CO_2 emissions for the Build with Mitigation scenario in the EENF. This reduction is noteworthy; however it appears higher than comparable projects with similar stationary and mobile source GHG measures. The Single EIR must demonstrate how the Proponent has calculated this reduction, and how the proposed mitigation measures will achieve the predicted reduction, or any predicted higher reduction resulting from additional GHG mitigation measures proposed in the Single EIR. This updated GHG analysis should be prepared after consultation with MassDEP, Division of Energy Resources (DOER), and the MEPA office to confirm modeling assumptions, proposed mitigation measures, and other modeling protocols.

Commenters have outlined additional GHG reduction measures that were not considered in the EENF GHG analysis. The Proponent should evaluate the feasibility of the additional suggested measures.

The Single EIR should respond to the comments by MassDEP/DOER with respect to:

- Explanation of building orientation and discussion of expected impacts on energy usage;
- Energy efficient exterior lighting;
- Interior day-lighting of buildings;
- Duct insulation;
- Incorporation of third-party building commissioning;
- Implementation of building energy management systems;

- Roof and wall insulation;
- Windows;
- On-site renewable energy sources. The Single EIR should evaluate the use of photovoltaic (PV) systems in accordance with the recommendations of DOER. The Single EIR should also investigate the use of solar thermal sources on-site;
- District heating and cooling systems or if this is infeasible, HVAC systems;
- Water supply and wastewater treatment facility energy demands; and
- Materials management.

If the proponent chooses not to model a specific mitigation measure recommended by MassDEP/DOER because it determines the measure to be infeasible for this particular project, the Single EIR must justify why modeling was not conducted. If, after further evaluation of a GHG mitigation measure using energy modeling software, the proponent does not propose to implement the measure, the Single EIR should provide technical and cost analyses to document the rationale for not making the commitment.

The GHG analysis should include updated indirect emissions sources information based on a revised mesoscale analysis. The GHG analysis should be based on the version of the Massachusetts State Building Code in effect at the time of the filing of the Single EIR. The Single EIR should evaluate both the anticipated GHG impact of new construction, as well as the GHG impacts associated with existing facilities that will remain part of the project (i.e. the existing office building and hotel). I encourage the Proponent to consider retrofitting building systems or materials in the office and hotel buildings as a way to reduce net CO_2 emissions from the project site. The proponent should clarify which specific measures will be implemented, provide supporting modeling data that reflects the implementation of these measures, and clearly depict how these measures reduce GHG emissions in a future Build with Mitigation scenario. The Single EIR should clearly present modeling data inputs, the results of calculations used to quantify Existing Conditions, the Build Conditions, and the impact of proposed emissions-reduction mitigation. If the proponent uses graphics, graphics should be produced so that the reader can understand the results and understand the potential CO_2 reductions associated with individual mitigation measures. In the Single EIR, the proponent should fully explain any trade-offs inherent in the evaluation of GHG reduction measures, such as increased impacts on some resources to avoid impacts to other resources. If it is not possible to implement significant GHG emissions reduction measures on site, the Proponent should consider off-site mitigation measures or offsets as outlined in the GHG Policy.

Wetlands, Waterways and Tidelands

The project site contains approximately 10.8 acres of filled private tidelands. The project site also contains 26.7 acres of Land Subject to Coastal Storm Flowage. The site is entirely separated from the nearest flowed tidelands in Dorchester Bay by the DCR Old Harbor Reservation. The EENF has noted that since the project itself is not directly located on Dorchester Bay, the Proponent has focused on improving the access to these areas from the surrounding street and public transit network in order to meet the public benefit components of

the c.91 Regulations. The MassDEP Waterways Regulation Program (WRP) has indicated that a relatively small portion of the Phase I buildings are subject to c.91 jurisdiction, but each of the conceptual buildings shown for Phase II are entirely or substantially within c.91 jurisdiction. Parking areas, roadways, open space and utilities are also located within c. 91 jurisdiction. The Single EIR should also document the proportion of filled tidelands within the Phase I area that will be covered by the buildings to be constructed in that phase.

The WRP has acknowledged the Proponent's request for a consolidated written determination (CWD) for Phase I, which would allow for the separate c.91 licensing of each building, as necessary. The WRP has stated that each phase of the project and the project in its entirety should comply with the c.91 regulations. The Single EIR should provide an updated discussion of how the project will meet the c.91 regulatory requirements, noting that the entrance roadway from Day Boulevard may also require c.91 authorization. I encourage the proponent to continue to explore ways to enhance public access and enjoyment of the parkland adjacent to the project site. Such mitigation may include maintenance agreements, signage, or other access enhancements to ensure continued public access to the area. Finally, in the advancement of the Phase I design and layout, the Proponent should consider the potential impact of Phase I design on the ability to meet future c.91 requirements associated with Phase II and full build-out.

The Office of Coastal Zone Management (CZM) has requested additional information in the Single EIR regarding the location and extent of flood zones on the project site. The Single EIR should provide details regarding how the flood zones were delineated and provide an overlay of the zones on a plan showing the current elevations. The Proponent has indicated in the EENF that the site will be graded to raise the lowest portions of the site out of the flood zone. The EENF also noted that considerations for sea-level rise will be worked into the final elevations of buildings and grades. The Single EIR should elaborate on how elevations will be adjusted to allow for sea-level rise, including the source of anticipated sea-level rise data. The Proponent should address the CZM recommendations regarding the potential for wave propagation impact to the proposed area of fill, channelization of flow, and alternative project designs that may reduce potential impacts associated with the proposed project. A conceptual discussion of these mitigation measures should be presented in the Single EIR.

Stormwater

The Single EIR should evaluate stormwater runoff impacts during construction and post-construction periods. The Single EIR must demonstrate that source controls, pollution prevention measures, erosion and sedimentation control, and the post-development drainage system will be designed in compliance with the MassDEP Stormwater Management regulations (SMR). Consideration should be given to the presence of contaminated groundwater, sediment or stormwater in the development of Best Management Practices (BMPs) for the erosion control plan. In compliance with the SMR, the Single EIR should include a discussion of what types of low impact development (LID) and integrated management practices (IMP) were considered for use on the project site and those that will be implemented into the final project design.

Existing and proposed drainage conditions should be confirmed in the Single EIR, including any modifications or connections that may be necessary within DCR roadways subsequent to intersection improvements. The Proponent should outline how stormwater discharges will be handled if the new CSO is not complete by the time Phase I goes online. The Single EIR should address how as much stormwater as possible will be retained on-site and the feasibility of recharging groundwater through the infiltration of stormwater from roof runoff or other sources.

Wastewater / Water

The project will generate a total of approximately 200,860 GPD of wastewater. Wastewater generated by the project will discharge into the Boston Water and Sewer Commission (BWSC) sewer system, which flows into the MWRA system and ultimately to the Deer Island Wastewater Treatment Facility.

The MWRA has noted that given the location of the existing (MWRA Sewer Section 175) and the new Combined Sewer Overflows (CSO) facilities planning near the project site, the Proponent will be required to file an MWRA 8(m) permit application. The proponent should actively work with the MWRA during this permitting process. Additional project permitting requirements may be necessary for wastewater discharges from the project site. These permitting requirements would be associated with groundwater discharges, the use of gas/oil separators in the proposed parking garages and/or discharges from hotel laundry or commercial wastewater.

The Proponent should confirm that the water, sewer, and storm drainage systems serving the project site have sufficient capacity to meet the project demands. The Single EIR should include estimates of peak water demand for the proposed project and include irrigation water demand (if any) in both daily flow and peak water demand estimates. The Single EIR should outline a plan for water reduction measures that will be incorporated into site design and operations. MassDEP routinely requires Proponents proposing to add significant new wastewater flow to assist in the reduction of infiltration and inflow (I/I) to ensure that the additional wastewater flows are offset by the removal of I/I. The Proponent should work with the BWSC, and consult with MassDEP, to remove a minimum 4:1 ratio of I/I removal.

Construction Period Impacts

The Single EIR should provide updated information on construction sequencing, phasing and construction period impacts. The Single EIR should conceptually address how existing uses on or adjacent to the project site (i.e. the Teacher's Parcel, etc.) will continue to operate during the construction period. The proponent must comply with MassDEP's Solid Waste and Air Quality Control regulations during construction. The Single EIR should discuss and commit to a plan for reuse and recycling of construction materials. The proponent should consult with MassDEP for appropriate standards and guidelines for managing demolition and construction waste.

I encourage the proponent to outline in the Single EIR the measures that will be implemented to reduce construction-period diesel emission mitigation. Current options to reduce the emissions include the installation of after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). Additionally, MassDEP has recommended that the Proponent use ultra low sulfur diesel (ULSD) fuel in construction equipment. Commitments to these mitigation measures may be outlined in the Single EIR.

Mitigation

The Bayside project provides numerous opportunities for mitigation of anticipated project impacts. The Single EIR should outline a clear commitment to viable and effective mitigation measures to offset projected environmental impacts. The Single EIR should include a separate chapter summarizing proposed mitigation measures. The proposed mitigation measures should anticipate to the extent possible the necessary mitigation measures associated with Phase II of the development and discuss how Phase I mitigation measures will not preclude any necessary mitigation for Phase II of the development. This chapter should also include a draft Section 61 finding for each state agency that will issue permits for the project. Each draft Section 61 finding should contain clear commitments to implement mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation based upon discrete project construction milestones.

Comments/Circulation

The Single EIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the Single EIR should include a response to comments. This directive is not intended to, and shall not be construed to, enlarge the scope of the Single EIR beyond what has been expressly identified in this certificate.

The proponent should circulate the Single EIR to those parties who commented on the ENF, to any state agencies from which the proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations. A copy of the Single EIR should be made available for review at the local branch of the Boston Public Library.

August 22, 2008
Date

Ian A. Bowles

Comments received:

08/13/2008 Massachusetts Water Resources Authority
08/15/2008 Office of Coastal Zone Management
08/15/2008 Boston Parks and Recreation Department

08/15/2008 Boston Water and Sewer Commission
08/18/2008 Massachusetts Department of Environmental Protection – NERO
08/18/2008 Department of Conservation and Recreation
08/18/2008 WalkBoston
08/18/2008 The Boston Harbor Association

IAB/HSJ/hsj

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October 3, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS ON THE EXPANDED ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: The Merano
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 14304
PROJECT PROPONENT	: Boston Development Group
DATE NOTICED IN MONITOR	: August 27, 2008

Pursuant to the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62I) and Section 11.11 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Expanded Environmental Notification Form (EENF) for this project and hereby determine that it **does not require** further MEPA review. In a separate Draft Record of Decision (DROD) also issued today, I have proposed to grant a Waiver from the requirement to prepare a Mandatory Environmental Impact Report (EIR).

Project Description

As described in the EENF, the project consists of the design and construction of a 463,000 square foot (sf) mixed use development in Boston, MA. The project includes approximately 190,000 sf of hotel uses (short-term and long-term), 206,000 sf of office space, 10,000 sf of retail and 13,000 sf of restaurant space. It will include a parking garage on the second floor that will provide 203 spaces (93 double stacked and 17 single). The project requires demolition of a one-story commercial building at 88 North Washington Street.

The project site includes Parcel 1B, Parcel 1C and 86-88 Washington Street. Parcel 1B was created by the demolition of the elevated I-93 highway structures and is owned by the Massachusetts Turnpike Authority (MTA). The proponent was designated as the developer of this parcel by the MTA following a public Request for Proposal process that included public presentations and meetings. The proponent will lease the property from MTA through a ground lease. Parcel 1C and 86-88 Washington Street are owned or will be owned by the proponent.

The 1.26-acre site is bounded by Causeway Street, Beverly Street, Valenti Way, North Washington Street and buildings along Medford Street, including 239 Causeway Street and 98 North Washington Street. It is in close proximity to the Massachusetts Bay Transportation Authority (MBTA) Green Line and Orange Line and the commuter rail at North Station. The parcel, which is located over MTA tunnels, is vacant with the exception of an area used for surface parking. It is located on landlocked tidelands approximately 415 feet from the shoreline of Boston Inner Harbor and within the City of Boston Groundwater Conservation Overlay District. The site is located immediately adjacent to the Causeway/North Washington Street District, which is eligible for listing on the National Register of Historic Places. It is located in the vicinity of the Bulfinch Triangle District, which is listed in the State and National Registers of Historic Places and in the vicinity of the North End Area, an area included in the Inventory of Historic and Archaeological Assets of the Commonwealth.

Permitting/Jurisdiction

The project is undergoing MEPA review and subject to preparation of a Mandatory EIR pursuant to 11.03 (6)(a)(6) because it requires a state permit and will generate 3,000 or more new average daily traffic (adt) on roadways providing access to a single location. The project requires a Sewer Connection Permit from the Massachusetts Department of Environmental Protection (MassDEP), a long-term ground lease from the MTA and review by the Massachusetts Historical Commission (MHC). The project may require authorization from the Executive Office of Transportation and Public Works (EOTPW) for use of former railroad right of way (ROW). The project is subject to the MEPA Greenhouse Gas Emissions Policy and Protocol and will require a Public Benefits Determination for use of landlocked tidelands. Also, it requires a Sewer Use Discharge Permit and Construction Dewatering Permit from the Massachusetts Water Resources Authority (MWRA).

The project is subject to Article 80 Large Project Review by the Boston Redevelopment Authority (BRA) pursuant to Article 80 of the Boston Zoning Code. The BRA issued a decision on the Project Notification Form (PNF) on September 23, 2008 indicating that no further review was required. In addition, it requires multiple permits and reviews by the City of Boston including development and review of a Construction Management Plan and a Transportation and Access Plan Agreement by the Boston Transportation Department (BTD). The project will require zoning relief including relief for dimensions and setback requirements as well as the proposed hotel and parking.

Because the proponent is seeking a land transfer, in the form of a ground lease, MEPA jurisdiction extends to those aspects of the project within the area subject to the land transfer that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA

regulations. Pursuant to 301 CMR 11.01(2)(a)(3), MEPA subject matter jurisdiction is functionally equivalent to full scope jurisdiction.

Potential Environmental Impacts

Potential environmental impacts associated with the project include the generation of approximately 7,294 unadjusted average daily vehicle trips (adt), use of 63,701 gallons per day (gpd) of water, generation of 57,910 gpd of wastewater and non-water dependent use of landlocked tidelands. Re-development of this site that is located in close proximity to transit will minimize overall impacts. Effort to avoid, minimize and mitigate project impacts include design and construction of a building that is certifiable by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) as required by Article 37 of the Boston Zoning Code, implementation of a Transportation Demand Management (TDM) Program, provision of a limited parking supply to minimize vehicle trips, provision of sidewalks and lighting to create safe pedestrian access, a $12,000 contribution to the Bulfinch Triangle Streetscape Improvements Initiative, a $300,000 contribution (or equivalent work) to the Crossroads Initiative and a $50,000 contribution toward the Bulfinch Triangle Traffic Study.

Waiver Request

The proponent has requested a Waiver of the requirement to prepare an EIR. An EENF was submitted in conjunction with this request and it was subject to an extended comment period as required. The EENF identifies the environmental impacts of the project and describes measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts. The Waiver request was discussed at the scoping session for the project which was held on September 10, 2008.

Review of the EENF

The EENF provides a detailed project description and plans that provide a clear understanding of the proposed project within its context. The EENF identifies the potential environmental impacts of the project and describes measures to be undertaken by the proponent to avoid, minimize and mitigate project impacts. The EENF includes a traffic study, air quality analysis, greenhouse gas analysis and identification of impacts to historic resources.

The EENF and comments from Downtown North Association (DNA) identify the extensive amount of land use, urban design and transportation studies conducted within the Bulfinch Triangle over the past decade. The North Area Planning Initiative and the Bulfinch Triangle Design and Development Guidelines emerged from these studies and articulate a comprehensive vision for urban design and development. Comments from DNA indicate that the project has involved substantive and continuing community participation, through the Bulfinch Triangle Community Advisory Committee (BTCAC), in the developer selection and ongoing permitting processes that were based on those guidelines. Comments from DNA and the Bulfinch Triangle Community Advisory Committee (BTCAC) indicate support for the Waiver.

Transportation

As noted previously, trip generation is estimated at over 3,000 adt based on the ITE Trip Generation Manual. According to the EENF, the project will generate 7,294 unadjusted average daily vehicle trips (adt). Use of BTD mode shares to adjust this estimate results in approximately 2,044 adt. This estimate is lower than the mandatory EIR threshold of 3,000 adt.

The EENF describes measures to reduce transportation related impacts and identifies a TDM Program to minimize trips. The TDM Program includes limited parking, designating a transportation coordinator, providing orientation packets to residents regarding transit options, and bicycle racks for at least 23 bikes. The EENF indicates that the overall parking ratio associated with the project is .44 per 1,000 sf of program area. Also, the project may include a partnership with a car sharing service. These efforts will leverage the range of transportation resources available in the district and the relatively low parking ratio increases the likelihood that residents will use transit.

In addition, the project will contribute $300,000 or perform a comparable amount of work, to the Boston Crossroads Initiative. This City initiative was developed to redesign and revitalize the roads that cross the Rose Fitzgerald Kennedy Greenway and connect people to neighborhoods and destinations on either side. These funds will be targeted towards improvements to Causeway Street that will extend from Lomansey Way/Merrimack Street to Prince Street. Also, the project will contribute $12,000 to the Bulfinch Triangle Streetscape Improvements Initiative and will contribute $50,000 towards the Bulfinch Triangle Traffic Study.

Historic and Cultural Resources

As part of the environmental planning and "joint development" process of the CA/T Project, the MHC, as State Historic Preservation Officer, must review and approve the design of development parcels in compliance with the Central Artery Memorandum of Agreement (MOA), pursuant to Section 106 of the National Historic Preservation Act (36 CFR 800). Under the terms of the Section 106 MOA, the MHC, in consultation with the Boston Landmarks Commission (BLC), must review and approve the new design of any new construction on any of the air rights parcels to ensure they meet established guidelines that include height limits, design issues, massing, materials, siting and setback requirements.

The project will exceed the 100-foot maximum height identified in the Joint Development Guidelines (JDG). The EENF indicates that the proponent considered limiting the project height to 100 feet and to 149 feet; however, available floor area is limited existing utilities and the setback required to provide adequate fire separation as well as adequate light and ventilation to rear elevations of 6-24 Medford Street and 90 North Washington. In addition, massing of the building is designed to minimize the visibility of the new construction from within the Causeway/North Washington Street District. The EENF indicates that these constraints present a significant limitation on usable space and would render the project financially infeasible. Efforts to minimize impacts include creation of a plaza at Beverly Street and Causeway Street by setting the first floor back at this corner; aligning the façade with the façade of 239 Causeway Street; lowering of the office portion of the project at the corner of Valenti Way and North Washington Street to bring it to the same height as 90 North Washington

Street; and relocation of the garage ramp to Valenti Way and the office and retail loading toward the porte cochere.

Comments received from MHC note that the proposed buildings exceed the height limits established by the JDG and indicate that the project will have an adverse effect on the Bulfinch Triangle and Causeway/North Washington Street historic districts through the introduction of visual elements that are out of character with and alter the setting of these historic districts. MHC comments request consideration of design alternatives for the proposed height and massing. To address MHC concerns, the proponent will be required to consult with MHC regarding alternatives as a condition of the DROD. In addition, the proponent will be required to provide more detailed elevation drawings that depict proposed materials and sketches or more detailed descriptions of the proposed fenestration reveals as well as depths/dimensions of other applied or structural exterior details.

Greenhouse Gas Emissions

The Climate Protection and Green Economy Act, signed into law on August 7, is a clear indication that the Commonwealth understands the risks posed by global warming and is committed to ensuring that Massachusetts does its part to reduce its greenhouse gas emissions. This law will require that the Commonwealth quantify all sources of GHG emissions and take effective steps to minimize contributions from each sector. Prior to the Act, the MEPA Greenhouse Gas Emissions Policy and Protocol was established to require proponents to analyze GHG emissions associated with the project and identify measures to avoid, minimize and mitigate emissions. This project is subject to the Policy and the EENF includes a GHG analysis that calculates total carbon dioxide (CO_2) emissions by adding transportation emissions with direct and indirect stationary emissions (from on-site sources and energy use). As required, it calculates and compares GHG emissions associated with the following alternatives: 1) a code-compliant baseline (Code Baseline), 2) the preferred alternative (Enhanced Design Alternative) and project alternatives with greater GHG emissions-related mitigation than the preferred alternative (LEED GHG Mitigation). Stationary source emissions were developed using the TRACE® 700V6 model and modeling assumptions for each alternative are identified in the EENF. Transportation emissions were developed based on the mesoscale study area and the MOBILE 6.2 emission model.

Based on its analysis, the EENF indicates that the proponent will implement the LEED GHG Mitigation alternative to obtain greater emissions reductions. These measures include compliance with Article 37 of the Boston Zoning Code by constructing a LEED Certifiable building. Sustainable design elements include the redevelopment of an existing site in close proximity to transit, a low parking ratio, a TDM program including bike storage, incorporation of low albedo roofing or a green roof, high efficiency HVAC systems, daylighting, energy efficient lighting, refrigerants with a low global warming potential, dedicated space for recycling infrastructure, use of construction materials with recycled content, use of regionally manufactured construction materials, re-use of stormwater for irrigation and water conservation. In addition, the EENF indicates that the proponent is considering incorporation of on-site renewable energy and cogeneration to provide more efficient heating, cooling and electrical supply.

The EENF indicates that proposed mitigation will reduce direct and indirect stationary sources from a baseline of 673 tpy to 584 tpy for a reduction of 89 tons per year (tpy), or a 13% reduction. It estimates that transportation related emissions will increase from 12,158 tpy for the 2012 No-Build to 12,337 tpy for the the 2012 Build for an increase of 179.1 tpy. It does not identify reductions associated with the project's proposed TDM program.

MassDEP comments, which incorporate comments from the Division of Energy Resources (DOER) identify the significant measures the proponent is committed to while noting that there are several opportunities available to further reduce GHG emissions including: third party building commissioning to ensure the commissioning process is thorough and energy performance of the building is consistent with the energy modeling and the equipment specifications; monitoring of building energy management systems; use of roof and wall insulation with the maximum R-value possible; consideration of solar PV or solar thermal; an enhanced rainwater harvesting system; and consideration of other measures to minimize water demand. In addition, MassDEP requests that the proponent conduct a life-cycle cost analysis to evaluate the installation of a PV system during project construction under two scenarios: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party that will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. MassDEP comments identify additional information that should be provided for the GHG analysis including the type of exterior and interior lighting for each building, what "enhanced" commissioning consists of, identification of the R-value of proposed roof and wall insulation, water savings associated with the rainwater harvesting and an analysis of the GHG reductions associated with materials management.

While I commend the proponent for committing to the sustainable design elements listed above, I agree with MassDEP and DOER that the proponent could further reduce its GHG emissions. As a condition of the DROD, I am requiring the proponent to provide additional details regarding its GHG analysis for review by commentors. The proponent should evaluate all of the measures identified in the MassDEP comment letter, provide additional information regarding the feasibility of a cogeneration system and provide a life cycle cost analysis for a PV system. In addition, the proponent should consider the reductions associated with the provision of significant transit subsidies to employees and/or operating subsidies for water transportation. I strongly encourage the proponent to consider adoption of additional mitigation measures based on the results of this supplemental analysis. I note that the MassDEP comment letter identified resources available to support this analysis and the feasibility of certain mitigation measures. In addition, I encourage the proponent to meet with EEA staff to discuss the development of this analysis and potential mitigation measures.

Wastewater

The project will generate approximately 57,910 gpd of wastewater. The ENF indicates that there is sufficient capacity in the existing collection system to accommodate the estimated wastewater flow. Wastewater generated by the project will discharge into the Boston Water and Sewer Commission (BWSC) sewer system, which flows into the Massachusetts Water Resources Authority (MWRA) system and ultimately to the Deer Island Wastewater Treatment Facility for treatment and discharge.

Comments from the Massachusetts Water Resources Authority (MWRA), MassDEP and Boston Water and Sewer Commission (BWSC) note that the proponent should participate in efforts to remove extraneous clean water (Infiltration/Inflow (I/I)) from the sewer system on a 4:1 basis for a total of 235,640 gpd. The Draft Record of Decision (DROD) includes a condition that the proponent will offset I/I on a 4:1 basis. These comments also indicate that the proponent should consult with the Boston Water and Sewer Commission (BWSC) and the MWRA to ensure the project does not interfere with the Bulfinch Triangle Sewer Separation project.

Landlocked Tidelands

The project is proposed on landlocked tidelands and subject to the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168). Consistent with Section 8 of this legislation, I must conduct a Public Benefits Review as part of the EIR review of projects located on landlocked tidelands that entail a new use or modification of an existing use. Accordingly, I will make a Public Benefits Determination within 30 days of the issuance of the Final Record of Decision (FROD) or, in the event the Waiver is not granted, within 30 days of the issuance of the Certificate on the Final EIR.

Section 3 of this legislation requires that any project that is subject to MEPA review and proposes a new use or structure or modification of an existing use or structure within landlocked tidelands address the project's impacts on tidelands and groundwater within the ENF. It indicates that the ENF *"shall include an explanation of the project's impact on the public's right to access, use and enjoy tidelands that are protected by chapter 91, and identify measures to avoid, minimize or mitigate any adverse impacts on such rights set forth herein."* If a project is located in an area where low groundwater levels have been identified by a municipality or by a state or federal agency as a threat to building foundations, the ENF *"shall also include an explanation of the project's impacts on groundwater levels, and identification and commitment to taking measures to avoid, minimize, or mitigate any adverse impacts on groundwater levels."* The legislation notes that these provisions also apply to the filing of an EIR if an EIR is required.

The EENF submitted on this project addresses the project's impacts on the public's right to use landlocked tidelands and on groundwater levels. It indicates that the project will not interfere with access to the waterfront or to open space. The project will provide adequate pedestrian access around and through the site and will improve access to the Charles River and Boston Harbor through creation of continuous streetwalls along Causeway Street, Beverly Street and Valenti Way and investment in the Boston Crossroads Initiative. The building will include two hotels and active ground-level uses including retail and restaurant uses, all of which will be open to the public.

Because the project consists of construction over highway tunnels, its impact on groundwater will be minimal. The DROD includes a condition that the proponent must certify that the project will not negatively impact groundwater levels on the site or on adjacent lots consistent with Article 32, Section 6 of the Boston Zoning Code. Comments from the Boston Groundwater Trust provided to the BRA (dated July 23, 2008) do not identify any significant concerns with impact of the project on groundwater levels.

Comments from MassDEP indicate that the combination of public interior uses, pedestrian and visual connections, and open space improvements could serve to attract the public to and through the site and along the waterfront and that these improvements strengthen the pedestrian link between the Charles River and the Rose Kennedy Greenway. MassDEP supports the creation of a plaza at the Causeway Street/Beverly Street corridor. Although MassDEP supports the proposed seasonal outdoor dining and plantings, they note that the sidewalk must be wide enough to provide these amenities without hampering pedestrian access. In addition, these comments suggest that the TDM Program should include water transportation amongst the marketing and transit subsidies being offered. Water taxis use the dock at the base of Lovejoy Wharf, and when the wharf is redeveloped, the proponent could provide operating subsidies to support reactivation of regular water transportation service to other points in the harbor.

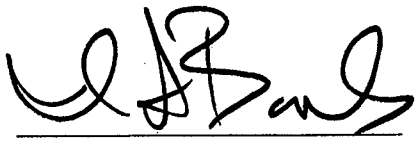
I note that the Walk Boston comment letter identifies potential concerns with the project design and its impact on pedestrian access and safety. I understand that efforts are ongoing to address vehicular and pedestrian issues related to development within the Bulfinch Triangle. I encourage the proponent to consult with Walk Boston and the City of Boston, and other area developers, regarding issues identified in this comment letter (and the MassDEP letter) to ensure that the project will provide adequate pedestrian access and safety.

Conclusion

Based on a review of the information provided by the Proponent and after consultation with the relevant public agencies, I find that the potential impacts of this project do not warrant further MEPA review. Outstanding issues may be addressed during the permitting process.

I have also issued a Draft Record of Decision (DROD) today proposing to grant a Waiver from the requirement to prepare an EIR for the project. The DROD will be will be published in the October 8, 2008 Environmental Monitor in accordance with 301 CMR 11.15(2), which begins the public comment period. The public comment period lasts for 14 days and will end on October 22, 2008. Based on written comments received on the DROD, I shall issue a Final Record of Decision or a Scope within seven days after the close of the public comment period, in accordance with 301 CMR 11.15(6).

October 3, 2008
Date



Ian A. Bowles

Comments received:

9/26/08	Department of Environmental Protection/Northeast Regional Office (MassDEP NERO)
9/16/08	Massachusetts Historical Commission (MHC)
9/26/08	Massachusetts Water Resources Authority (MWRA)
9/26/08	Boston Water and Sewer Commission
	City of Boston Environment Department
9/15/08	Downtown North Association
9/15/08	Bulfinch Triangle Community Advisory Committee
9/26/08	Walk Boston

IAB/CDB/cdb

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
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October 3, 2008

DRAFT RECORD OF DECISION

PROJECT NAME	: The Merano
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 14304
PROJECT PROPONENT	: Boston Development Group
DATE NOTICED IN MONITOR	: August 27, 2008

Pursuant to the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62I) and Section 11.11 of the MEPA Regulations (301 CMR 11.00), I have reviewed this project and hereby **propose to grant a waiver** from the categorical requirement to prepare an Environmental Impact Report (EIR). In a separate Certificate also issued today, I have set forth the outstanding issues related to the project that can be addressed by permitting agencies.

Project Description

As described in the EENF, the project consists of the design and construction of a 463,000 square foot (sf) mixed use development in Boston, MA. The project includes approximately 190,000 sf of hotel uses (short-term and long-term), 206,000 sf of office space, 10,000 sf of retail and 13,000 sf of restaurant space. It will include a parking garage on the second floor that will provide 203 spaces (93 double stacked and 17 single). The project requires demolition of a one-story commercial building at 88 North Washington Street.

The project site includes Parcel 1B, Parcel 1C and 86-88 Washington Street. Parcel 1B was created by the demolition of the elevated I-93 highway structures and is owned by the Massachusetts Turnpike Authority (MTA). The proponent was designated as the developer of this parcel by the MTA following a public Request for Proposal process that included public

presentations and meetings. The proponent will lease the property from MTA through a ground lease. Parcel 1C and 86-88 Washington Street are owned or will be owned by the proponent.

The 1.26-acre site is bounded by Causeway Street, Beverly Street, Valenti Way, North Washington Street and buildings along Medford Street, including 239 Causeway Street and 98 North Washington Street. It is in close proximity to the Massachusetts Bay Transportation Authority (MBTA) Green Line and Orange Line and the commuter rail at North Station. The parcel, which is located over MTA tunnels, is vacant with the exception of an area used for surface parking. It is located on landlocked tidelands approximately 415 feet from the shoreline of Boston Inner Harbor and within the City of Boston Groundwater Conservation Overlay District. The site is located immediately adjacent to the Causeway/North Washington Street District, which is eligible for listing on the National Register of Historic Places. It is located in the vicinity of the Bulfinch Triangle District, which is listed in the State and National Registers of Historic Places and in the vicinity of the North End Area, an area included in the Inventory of Historic and Archaeological Assets of the Commonwealth.

Permitting/Jurisdiction

The project is undergoing MEPA review and subject to preparation of a Mandatory EIR pursuant to 11.03 (6)(a)(6) because it requires a state permit and will generate 3,000 or more new average daily traffic (adt) on roadways providing access to a single location. The project requires a Sewer Connection Permit from the Massachusetts Department of Environmental Protection (MassDEP), a long-term ground lease from the MTA and review by the Massachusetts Historical Commission (MHC). The project may require authorization from the Executive Office of Transportation and Public Works (EOTPW) for use of former railroad right of way (ROW). The project is subject to the MEPA Greenhouse Gas Emissions Policy and Protocol and will require a Public Benefits Determination for use of landlocked tidelands. Also, it requires a Sewer Use Discharge Permit and Construction Dewatering Permit from the Massachusetts Water Resources Authority (MWRA).

The project is subject to Article 80 Large Project Review by the Boston Redevelopment Authority (BRA) pursuant to Article 80 of the Boston Zoning Code. The BRA issued a decision on the Project Notification Form (PNF) on September 23, 2008 indicating that no further review was required. In addition, it requires multiple permits and reviews by the City of Boston including development and review of a Construction Management Plan and a Transportation and Access Plan Agreement by the Boston Transportation Department (BTD). The project will require zoning relief including relief for dimensions and setback requirements as well as the proposed hotel and parking.

Because the proponent is seeking a land transfer, in the form of a ground lease, MEPA jurisdiction extends to those aspects of the project within the area subject to the land transfer that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations. Pursuant to 301 CMR 11.01(2)(a)(3), MEPA subject matter jurisdiction is functionally equivalent to full scope jurisdiction.

Summary of Potential Environmental Impacts

Potential environmental impacts associated with the project include the generation of approximately 2,044 adjusted adt, use of 63,701 gallons per day (gpd) of water, generation of 57,910 gpd of wastewater, use of non-water dependent use of landlocked tidelands.

Summary of Proposed Mitigation Measures

The EENF and supplemental information provided on February 27, 2008, identify the project's consistency with the Commonwealth's Sustainable Development Principles and describe the following measures to avoid, minimize and mitigate environmental impacts:

- re-development of a vacant lot located in close proximity to transit;
- design and construction of a building that is certifiable by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) as required by Article 37 of the Boston Zoning Code;
- measures to minimize GHG emissions associated with the project including low albedo roofing or a green roof, high efficiency HVAC systems daylighting, energy efficient lighting, refrigerants with a low global warming potential, dedicated space for recycling infrastructure, use of construction materials with recycled content, use of regionally manufactured construction materials, re-use of stormwater for irrigation and water conservation;
- provision of adequate pedestrian access around and through the site including wide sidewalks, lighting and street furniture;
- creation of a plaza at the Causeway Street/Beverly Street corner of the site;
- development of a Transportation Demand Management (TDM) program and provision of a limited parking supply to minimize vehicle trips;
- support for streetscape improvements including a $300,000 contribution to the City of Boston Crossroads Initiative; and
- support for additional traffic analysis including $50,000 for a comprehensive study of the Bulfinch Triangle neighborhood.

In addition, the proponent indicates it is considering additional measures to minimize greenhouse gas emissions including on-site renewables and/or cogeneration.

Waiver Request

The proponent has requested a Waiver of the requirement to prepare an EIR. An EENF was submitted in conjunction with this request and it was subject to an extended comment period as required. The EENF identifies the environmental impacts of the project and describes measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts. The Waiver request was discussed at the scoping session for the project which was held on September 10, 2008.

Standards for All Waivers

The MEPA regulations at 301 CMR 11.11(1) state that I may waive any provision or requirement in 301 CMR 11.00 not specifically required by MEPA and may impose appropriate and relevant conditions or restrictions, provided that I find that strict compliance with the provision or requirement would:

(a) Result in an undue hardship for the Proponent, unless based on delay in compliance by the Proponent; and,

(b) Not serve to avoid or minimize Damage to the Environment.

Determinations for an EIR Waiver

The MEPA regulations at 301 CMR 11.11(3) state that, in the case of a waiver of a mandatory EIR review threshold, I shall at a minimum base the finding required in accordance with 301 CMR 11.11(1)(b) stated above on a determination that:

(a) The project is likely to cause no Damage to the Environment; and,

(b) Ample and unconstrained infrastructure facilities and services exist to support those aspects of the project within subject matter jurisdiction.

Findings

Based upon the information submitted by the Proponent, consultation with the relevant state agencies, and comment letters submitted on the project, I find that the Waiver request has merit and that the Proponent has demonstrated that the proposed project meets the standards for all waivers at 301 CMR 11.11(1).

As noted previously, the EENF identifies the environmental impacts of the project and identifies the project's consistency with the Commonwealth's Sustainable Development Principles. The EENF included a traffic study, a GHG analysis and describes measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts including commitments to minimize GHG emissions

State agency action associated with the project is limited to the issuance of a Sewer Connection Permit by MassDEP and a ground lease by MTA. State agency comments do not identify concerns with the granting of the waiver request although MassDEP does request additional analysis of GHG emissions and mitigation measures and consideration of transit subsidies. The EENF contains sufficient information to allow state agencies to understand the environmental consequences of its permit decision.

MHC, as the State Historic Preservation Officer, has reviewed the project as required by the "joint development" process of the Central Artery/Tunnel (CA/T) Project and the associated Memorandum of Agreement (MOA). Comments from MHC note that the proposed buildings exceed the height limits established by the JDG and indicate that the project will have an adverse effect on the Bulfinch Triangle and Causeway/North Washington Street historic districts through the introduction of visual elements that are out of character with and alter the setting of these historic districts. MHC comments request consideration of design alternatives for the proposed height and massing. The MHC comment letter does not identify concerns with the granting of a waiver.

Comment letters from the Downtown North Association (DNA) and the Bulfinch Triangle Community Advisory Committee (BTCAC) express strong support for the project and the Waiver. Comments from the Boston Groundwater Trust provided to the BRA (dated July 23, 2008) do not identify any significant concerns with the impact of the project on groundwater levels.

As noted previously, the categorical requirement to prepare an EIR is based on exceedance of a transportation threshold. Trip generation is estimated at over 3,000 adt based on the ITE Trip Generation Manual. According to the EENF, adjusting this estimate using BTD mode shares, results in an estimate of 2,044 adt. This estimate is lower than the mandatory EIR threshold of 3,000 adt. In addition, the trip generation and traffic impacts of the project have been reviewed by the City and BTD through the BRA Article 80 process. This review has resulted in a design that incorporates measures routinely required or encouraged through MEPA review including a low parking ratio, development of an effective TDM program, provision of transit subsidies and adequate pedestrian and bicycle infrastructure.

Based on the foregoing, I find that preparation of an EIR is not necessary in order for the proponent to demonstrate that it will avoid, minimize, and mitigate potential Damage to the Environment to the maximum extent practicable. Strict compliance with the requirement to prepare an EIR would therefore cause undue hardship and would not serve to minimize Damage to the Environment.

I also find that compliance with the requirement to prepare an EIR for the project would not serve to avoid or minimize Damage to the Environment. In accordance with 301 CMR 11.11(3), this finding is based on my determination that:

1. The project is likely to cause no Damage to the Environment:

- The project consists of redevelopment of a vacant lot. The site does not contain any significant natural resources or protected open space or parkland. Adequate mitigation will be provided for impacts to landlocked tidelands, transportation, wastewater and historic resources.

- The project is consistent with the Commonwealth's Sustainable Development Principles and is designed to be LEED certifiable. In addition, the proponent has conducted a GHG

analysis as required and committed to measures to reduce GHG emissions.

2. Ample and unconstrained infrastructure facilities and services exist to support those aspects of the project within subject matter jurisdiction:

- MassDEP and MWRA indicate that I/I mitigation can and should be provided to address any potential impacts to the wastewater infrastructure.

- Adequate pedestrian circulation is provided around and through the site and contributions to the Crossroads Initiative will improve pedestrian access and safety along Causeway Street;

- The project was approved by the BRA on September 23, 2008, thereby indicating that the project has provided an adequate description of and mitigation for potential community impacts.

3. The proposal to grant the Waiver is conditioned on the following to ensure the environmental impacts of the project are minimized:

- The proponent will revise its GHG analysis and identify any additional commitments to GHG reductions. The proponent must evaluate all of the measures identified in the MassDEP comment letter, provide additional information regarding the feasibility of a cogeneration system and provide a life cycle cost analysis for a PV system. I strongly encourage the proponent to consider adoption of additional mitigation measures based on the results of this supplemental analysis.

- The proponent will distribute the revised GHG analysis to all commentors prior to the close of the comment period on the DROD and, if necessary to provide adequate review time, will request an extension of the comment period on the DROD.

- The proponent will remove or cause to be removed approximately 235,640 gpd of I/I from the wastewater system.

- The proponent will consult with MHC regarding alternatives to the proposed building design and massing and will provide more detailed elevation drawings which depict proposed materials and will provide sketches or more detailed descriptions of the proposed fenestration reveals as well as depths/dimensions of other applied or structural exterior details.

- Consistent with Article 32, Section 6 of the Boston Zoning Code, the proponent will certify that the project will not negatively impact groundwater levels on the site or on adjacent lots.

- The proponent will participate in the MassDEP Diesel Retrofit Program to mitigate the construction-period impacts of diesel emissions to the maximum extent feasible. The

proponent will require contractors to retrofit construction vehicles with after-engine emission controls such as diesel oxidation catalysts (DOCs) and/or diesel particulate filters (DPFs) that are verified by the U.S. Environmental Protection Agency (EPA).

Conclusion

Based on these findings, I have determined that this waiver request has merit, and am issuing this Draft Record of Decision (DROD), which will be published in the next edition of the Environmental Monitor on October 8, 2008 in accordance with 301 CMR 11.15(2), which begins the public comment period. The public comment period lasts for 14 days and will end on October 22, 2008. Based on written comments received concerning the DROD, I shall issue a Final Record of Decision (FROD) or a Scope within seven days after the close of the public comment period, in accordance with 301 CMR 11.15(6). I hereby **propose to grant the waiver** requested for this project from the requirement to prepare a mandatory Environmental Impact Report (EIR), subject to the above findings and conditions.

October 3, 2008
Date

Ian A. Bowles

Comments received:

9/26/08	Department of Environmental Protection/Northeast Regional Office (MassDEP NERO)
9/16/08	Massachusetts Historical Commission (MHC)
9/26/08	Massachusetts Water Resources Authority (MWRA)
9/26/08	Boston Water and Sewer Commission
	City of Boston Environment Department
9/15/08	Downtown North Association
9/15/08	Bulfinch Triangle Community Advisory Committee
9/26/08	Walk Boston

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DB

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
NORTHEAST REGIONAL OFFICE
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DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

September 26, 2008

Ian A. Bowles, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

Attn: MEPA Unit

RE: Boston
The Merano
Causeway Street, Beverly Street, Valenti Way, and Medford Street
EEA # 14304

Dear Secretary Bowles:

The Massachusetts Department of Environmental Protection (MassDEP) in collaboration with the Division of Energy Resources in the Executive Office of Energy and Environmental Affairs (EEA/DOER) have reviewed the Environmental Notification Form (ENF) submitted by Boston Development Group to construct a 463,000 square foot, mixed use development with about 190,000 sf of hotel space, 206,000 sf of office space, 10,000 sf of retail, and about 13,000 sf of restaurant space with parking spaces for 203 vehicles in a second floor garage. The project is on a 1.26 acre site that was formerly within the right-of-way for Route I-93 in Boston (EEA #14304). The project is categorically included for the preparation of an environmental impact report (EIR), and the proponent has requested a waiver of this requirement. The Department provides the following comments.

Wastewater

The ENF indicates that there is sufficient capacity in the existing collection system to accommodate the estimated 57,910 gpd of new wastewater flow from the Merano project. Wastewater generated by the project will discharge into the Boston Water and Sewer Commission (BWSC) sewer system, which flows into the Massachusetts Water Resources Authority (MWRA) system and ultimately to the Deer Island Wastewater Treatment Facility.

MassDEP with MWRA and its member communities (including Boston), are implementing a coordinated approach to flow control in the MWRA regional wastewater system, particularly the removal of extraneous clean water (e.g., infiltration/ inflow (I/I)) in the system. In this regard, MassDEP has been routinely requiring proponents proposing to add significant

new wastewater flow, such as the Merano project, to assist in the I/I reduction effort to ensure that the additional wastewater flows are offset by the removal of I/I. Currently, MassDEP is using a minimum 4:1 ratio for I/I removal to new wastewater flow added. This ratio may be increased if specific flow constrictions/overflows already exist in the sewershed to which the new flow is added. Assuming that a 4:1 ratio is utilized, the proponent will need to remove, or cause to be removed, 235,640 gpd of I/I.

Chapter 91, Waterways

MassDEP has reviewed the public benefits the proponent has offered relating to the project location on landlocked tidelands and they are comparable to those offered at the adjacent Simpson Parcel 1 for which the Secretary issued a positive public benefit determination, (see EEA # 14153, Final Record of Decision (FROD), March 28, 2008).

Generally, the combination of public interior uses, pedestrian and visual connections, and open space improvements could serve to attract the public to and through the site and along the waterfront. These improvements strengthen the pedestrian link between the Charles River and the Rose Kennedy Greenway.

MassDEP agrees with the building design and massing modifications recommended by the Boston Civic Design Commission, including the first floor setback from the corner of Beverly Street and Causeway Street to create a plaza that complements another plaza across the intersection. The project also includes wide sidewalks and lighting, but then proposes seasonal outdoor dining and plantings. The plantings and pedestrian scale lighting would be a welcome addition, given the site's close proximity to the Charles River, transit connections, Portal Park, and the Greenway. However, care should be taken in designing the sidewalk wide enough to allow for the outdoor dining and pedestrian amenities without crowding pedestrian traffic. The proponent should consider including a series of benches and trash receptacles to further enhance the pedestrian experience.

The Department also recommends that the proposed *Transportation Demand Management Plan* include water transportation in the marketing and transit subsidies being offered. Water taxis are still utilizing the dock at the base of Lovejoy Wharf, and when the wharf is redeveloped, the neighboring developments could assist with the operational and financial contributions that are expected to reactivate a regular water transportation service to other points in the harbor, (see EEA File # 13415).

Greenhouse Gas Analysis (Stationary Sources)

The greenhouse gas analysis used the TRACE 700V6 model to evaluate the emissions from the MA Building Code baseline condition and two mitigation alternatives: 1) the enhanced design condition, which reduces direct stationary emissions by 10 percent, but **increases** indirect emissions by 9 percent; and 2) the LEED GHG mitigation condition, which reduces direct and indirect stationary emissions by 15 percent and 8 percent, respectively. The unexpected increase in energy demand for the enhanced design condition is attributed to higher energy use for water cooled chillers, auxiliary fans, and lighting (page C-5). In addition, Table C-2 shows that the energy use of primary cooling system for the LEED GHG Mitigation Condition is higher than the baseline alternative. Given that the intent of evaluating GHG mitigation alternatives is to show reductions in CO_2 emissions, the FEIR should reconsider whether there are more efficient

systems and equipment available to ensure that the alternatives show energy use reductions – not increases – when compared with the baseline condition. Transportation-related emissions also are estimated to increase by 1.5 percent, although there would be an overall CO_2 emissions reduction of 0.2 percent for the enhanced design alternative and 0.7 percent for the LEED GHG condition.

DOER has reviewed the ENF with respect to its commitments to mitigation measures for reducing greenhouse gases from stationary sources. The ENF notes that the energy performance in the building will exceed the baseline code compliant case by 14 percent (pages C-8, C-12). Meeting this standard would be in keeping with the MEPA GHG Policy which states that the project baseline for energy usage should be based on code-compliant buildings. Therefore, implemented energy mitigation measures for the project must extend beyond meeting the MA State Building Code. However, the project proponent is encouraged to strive for even greater reductions. Current requirements for new state buildings require 20 percent better than Code, and this has been shown to be readily achievable. In addition, it should be noted that the recently passed Green Communities Act requires that the International Energy Conservation Building Code be adopted and fully integrated into the state building code and therefore the MA requirements will be changing.

As the project moves forward, it is recommended that the project proponent contact the New Construction division of its electric utility provider, NStar, as well as its natural gas provider to take advantage of any potential rebates and technical assistance available for the installation of highly energy efficient equipment.

DOER commends the project proponent for its commitment to several worthwhile energy efficiency and mitigation measures, including building orientation, operable windows for natural ventilation, and light-colored or vegetated roofs. In general, as the project design continues to evolve, the DEIR should note the specific mitigation measures selected that will lead the project to meet the selected modeled scenarios.

Energy Efficient Lighting and Controls – The ENF notes that energy efficient lighting is planned. The subsequent filing should provide information on the exterior and interior lighting for the different buildings. For interior living spaces, such as the hotel, compact fluorescent lighting fixtures should be provided. For office spaces, enhanced or "Super T8" lighting, T5 or metal halide lighting should be installed, and for exit signs, LED lighting.

Third Party Building Commissioning – In accordance with LEED certifiable, the project will be meeting the LEED pre-requisite for building commissioning. Enhanced commissioning is being considered for the project. The subsequent filing should explain what is meant by "enhanced" and should fully consider third party commissioning to ensure the commissioning process is thorough and energy performance of the building is consistent with the energy modeling and the equipment specifications.

Building Energy Management Systems – The ENF indicates that Building Management Systems are being studied for all portions of the building(s). To ensure that the energy systems function as designed long term, a strategy should be developed for monitoring energy performance of all

buildings where the energy systems are centrally controlled and trends are monitored, possibly through a building management system. A building energy management system can incorporate basic energy saving measures such as lighting and climate control. A system or strategy for monitoring energy performance would be expected to pay for itself through eliminating potential inefficient building energy operations, such as heating and cooling operating simultaneously in January and taking advantage of night-time cooling during shoulder periods. By monitoring trends, a building management system can also note how system operations impact energy use and can potentially be altered to reduce consumption.

Duct Insulation – Beyond code compliant duct insulation, construction should reflect that all ducts will be sealed with mastic, tested and then insulated, since duct leakage can be a major factor in energy losses.

Roof and Wall Insulation – The next filing should consider and note roof and wall insulation of the maximum R-value possible. In general, insulation is very cost effective. The incremental cost of additional insulation is insignificant when measured against the energy savings over the life of the building.

Renewable/On-site Generation - The ENF (page C-8) notes that the project proponent is investigating the feasibility of solar photovoltaics (PV), solar thermal, geothermal heating, and cogeneration (CHP). However, the LEED checklist for the project does not include on-site renewable energy for the project.

At a minimum, buildings should be oriented and roofs should be constructed to support the added weight of a PV system for potential installation during project construction or at a future date. With the high-albedo roof materials planned for the project, rooftop PV would operate even more efficiently, due to the added reflectivity provided by the materials. Considering the support of subsidies through the Commonwealth Solar and RPS programs, a life-cycle cost analysis should be done to evaluate the installation of a PV system during project construction under two scenarios: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party that will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. If neither of these scenarios is economically feasible at this time, the project should continue to consider the opportunity for installing PV at a future date and state their willingness to host a third-party owned PV array under a favorable power purchase agreement. The following website provides information on the Commonwealth Solar program and tools for performing basic life cycle cost analyses: http://www.masstech.org/renewableenergy/commonwealth_solar/index.html#

In addition, solar thermal is another potential way to incorporate renewable energy. For those buildings with a steady, twenty-four hour a day hot water load, such as the hotel or the restaurant, solar thermal could potentially offset the hot water load for the building.

For the hotel with a constant twenty-four hour a day thermal load, CHP presents the opportunity for significant gains in efficiency and reductions in greenhouse gas. More information on CHP can be found through the USEPA Combined Heat and Power Application

Center, http://www.epa.gov/chp. In addition, under the Green Communities Act, CHP is eligible for subsidies under the Alternative Energy Portfolio Standard. The program is currently being defined and will be in place in January 2009. This standard will provide the opportunity for reducing the life-cycle costs of CHP.

However, with the project located in downtown Boston, it will be important for the developer to coordinate with NStar on onsite electrical generation. Some downtown locations present restrictions for interconnection with the electrical utility. However, there would be no issue for thermal technologies such as solar thermal.

Water Conservation

Although the main sources of GHG, from this project are associated with building heating and cooling, lighting, and vehicle travel, the energy required to provide potable water and treat wastewater also will be a source of GHG, and in particular CO_2. To gain an understating of the correlation between water/wastewater volumes and energy use requirements, MassDEP has reviewed data and information from the MWRA and estimates the average energy use for wastewater treatment at their Deer Island facility is 1.2 - 1.4 kWh/kgal. As indicated previously, the proposed development will generate approximately 57,910 gallons of wastewater per day or approximately 21,137,150 million gallons per year. Using an average energy cost of 1.3 kWh/kgal, the project will require approximately 27,478 kWh over the course of a year. The project proponent should consider this additional energy use when proposing measures to mitigate the additional GHG emissions that will result from treating wastewater from this proposed project.

In addition, the MWRA estimates that treating and transporting drinking water at their John Carrol Water Treatment Plant requires 0.14 to 0.23 kWh/kgal. This is slightly less than the estimated 0.3 kWh/kgal required to treat and transport drinking water at the Worcester Water Filtration facility. As the proposed project will require 63,701 gallons of potable water per day, or 23,250,865 gallons per year, and using energy costs of about 0.2 kWh/kgal, approximately 4,650 kWh will be required to supply the proposed project with potable water annually. In considering mitigation for wastewater, the project proponent also should consider the additional energy use from providing potable water for this proposed project.

The Department commends the proponent for proposing rainwater harvesting to help reduce potable water demand. However, there is no estimated reduction in water use for landscape irrigation as a result of rainwater harvesting. How will the system be sized in proportion to the available rooftop areas, and will all irrigation needs be met or exceeded with rainwater? As LEED certification allows up to seven points for rainwater harvesting systems, including a point each for reducing water savings by 20, 30, and 40 percent, there is an added incentive to enhance the RWH system to garner as many points as practicable.

Rainwater harvesting systems are being used as a source of water for toilets, urinals, water features, cooling towers, and secondary fire suppression. Therefore, the Department requests reconsideration of the rainwater collection system design and siting. If a commitment to an expanded RWH system cannot be made, information should be presented to show that an expanded system would be technically infeasible and/or not cost-effective over the lifetime of the project.

The low-flow fixtures and equipment that will be installed to reduce water demand also should be identified. Using USEPA's WaterSense website at http://www.epa.gov/owm/water-efficiency/, it also should be possible to affirm that at least 20 percent savings would be achieved with the plumbing fixtures and equipment selected. To achieve water and energy savings goals, consideration also should be given to using HVAC equipment with advanced evaporator coils, which have been reported to reduce water loss by about 50 percent and energy demand by up to 25 percent.[1] Other mitigation measures appropriate for reducing energy use for water and wastewater are water distribution system improvements to eliminate un-accounted for water losses and infiltration and inflow (I/I) removal from sewer mains, which also is required to offset wastewater generated by the project which has the potential to increase sewer and combined sewer overflows.

Materials Management

MassDEP commends the applicant for recognizing the importance of materials management within its ENF filing for the Merano project. In order to address GHG emissions related to materials management in the EIR, MassDEP requests that the applicant quantify the GHG impacts of materials management for the project development and projected future operation. By quantifying these impacts, the applicant's GHG mitigation efforts related to materials management can be more clearly identified and targeted appropriately. MassDEP seeks quantification to help guide changes in the project, which provide a comprehensive approach to materials management throughout the design, construction, and operational phases of the project. There are a number of resources available to help quantify GHG impacts associated with efficient materials management, including the USEPA Warm Model, available at the following website: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html, and the Building Reuse Calculator at: http://www.wastematch.org/calculator/calculator.htm.

During the **design phase**, MassDEP requests the applicant address waste reduction, environmentally preferable materials use, and the need to design for the storage and collection of recyclables. In order to plan for waste reduction, the applicant should consider implementing a waste prevention purchasing policy, which may include management options for reducing shipping and packaging materials, and if necessary, managing excess materials through unused product return or donation.

MassDEP also requests that the EIR provide the following information:

- a list of the environmentally preferred products to be used,
- the GHG impacts of using these materials, and
- an explanation for why an expanded commitment to use additional EPP materials (including on-site use of demolition materials, regionally produced materials, recycled content materials) is not applicable or cannot be confirmed.

MassDEP appreciates that the applicant will be providing for the storage and collection of recyclables, but requests that more specific information be provided on the square footage of the proposed storage area and the types of materials expected to be stored and recycled. The EIR should, at a minimum, demonstrate that the storage area would be sufficient to manage waste

[1] *Greener Pastures for America's Homebuilders?* Calvert Group, LTD. with collaboration from the Boston College Institute for Responsible Investment. March 2008.

materials currently prohibited from disposal in Massachusetts. A list of these materials can be found on the MassDEP website: http://www.mass.gov/dep/recycle/solid/regs0201.htm. In addition, MassDEP requests that the applicant identify how hazardous materials generated during facilities' operations, e.g., spent fluorescent bulbs, lubricants, waste oil, and other hazardous materials, would be managed and stored.

During the **construction phase**, MassDEP recommends that the applicant's material management efforts focus on material reuse and recycling. MassDEP requests the applicant commit to developing a construction waste management plan that fully complies with the Massachusetts Waste Bans and establishes a minimum reuse/recycling goal of 50 percent. The Department has demonstrated through pilot construction projects that this planning results in significant reductions in waste and cost savings for developers. Information and resources to assist in the development and implementation of a construction management plan can be found at http://www.mass.gov/dep/recycle/reduce/managing.htm#project.

In the **operations phase,** the applicant should develop and implement a waste management plan to ensure compliance with the MassDEP Waste Bans. The Department offers resources to assist in this area including planning tools, contracting language, and lists of service providers (http://www.mass.gov/dep/recycle/reduce/assistan.htm#reduce). The waste management plan should establish a target-recycling goal of more than 50 percent. This level of recycling has been achieved consistently in similar projects with demonstrated operational cost savings and capital asset appreciation benefits. A goal to manage construction waste and reduce waste material by about 75 percent has been proposed for the project (page C-12).

Facilitating future waste reduction and recycling and integrating recycled materials into the project are necessary to minimize or mitigate the long-term solid waste impacts of this type of development. The Commonwealth's waste diversion strategy is part of an integrated solid waste management plan, contained in The Solid Waste Master Plan that places a priority on source reduction and recycling. Efforts to reduce waste generation and promote recycling have yielded significant environmental and economic benefits to Massachusetts' residents, businesses and municipal governments over the last ten years. Waste diversion will become even more important in the future as the key means to conserve the state's declining supply of disposal capacity and stabilize waste disposal costs.

The project should be designed with facilities for collection of materials for recycling. The storage area should be designed to manage, at least the waste materials currently prohibited from disposal in Massachusetts. A list of these materials can be found on the MassDEP website: http://www.mass.gov/dep/recycle/solid/regs0201.htm. By incorporating recycling and source reduction into the design, the proponents would have the opportunity to join a national movement toward sustainable design. Sustainable design was endorsed in 1993 by the American Institute of Architects with the signing of its *Declaration of Interdependence for a Sustainable Future.* The project proponent should be aware there are several organizations that provide additional information and technical assistance, including WasteCap, the Chelsea Center for Recycling and Economic Development, and MassRecycle.

As the lead state agencies responsible for helping the Commonwealth achieve its waste diversion goals, MassDEP and EEA have strongly supported voluntary initiatives by the private sector to institutionalize source reduction and recycling into their operations. Adapting the design, infrastructure, and contractual requirements necessary to incorporate reduction, recycling and recycled products into existing large-scale developments has presented significant challenges to recycling proponents. Integrating those components into developments such as the Merano project at the planning and design stage enable the project's management and occupants to establish and maintain effective waste diversion programs. For example, facilities with minimal obstructions to trash receptacles and easy access to main recycling areas and trash chutes allow for implementation of recycling programs and have been proven to reduce cleaning costs by 20 percent to 50 percent. Other designs that provide sufficient space and electrical services will support consolidating and compacting recyclable material and truck access for recycling material collection.

Construction Period Air Quality

MassDEP recommends that the project proponent participate in the MassDEP Diesel Retrofit Program to mitigate the construction-period impacts of diesel emissions to the maximum extent feasible. Diesel emissions contain fine particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), which has been found to exacerbate a number of heath conditions, such as asthma and respiratory ailments. $PM_{2.5}$ also contributes to lung damage and has been identified as a likely carcinogen.

MassDEP staff are available to work with the project proponent to implement construction-period diesel emission mitigation, which could include the installation of after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). For more information on these technologies, see: http://www.epa.gov/otaq/retrofit/verif-list.htm.

In addition, MassDEP reminds the project proponent that off-road equipment engines must use low sulfur diesel (LSD) fuel as of July 2007, as required by a 2004 regulation issued by the U.S. Environmental Protection Agency. On-road LSD fuel has a sulfur content of approximately 500 parts per million (ppm) in contrast to the 3,000 ppm sulfur level of current off-road diesel fuel. The use of LSD fuel, in conjunction with after-engine emission controls, can reduce $PM_{2.5}$ by an additional 25 percent beyond that obtainable with after-engine controls only. Project proponents may also use on-road ultra low sulfur diesel (ULSD) fuel, which has a sulfur content of 15 ppm.

Massachusetts Contingency Plan

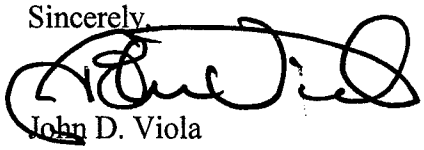
Prior to the proposed project, contamination remediation on site has been under an Amended Memorandum of Understanding between Massachusetts Highway Department and MassDEP. However, the project proponent is planning to comply with the provisions of MGL c.21E/21C and OSHA if it is necessary to remove contaminated soil, pumping contaminated groundwater, or work within contaminated media. To avoid delay of the project and the potential for administrative penalties, the proponent will need to obtain necessary permits under these provisions beforehand.

Air Quality

The project proponent is advised that pre-installation approval from the MassDEP Division of Air Quality Control is needed if the project will include the installation of any Fuel Utilization Facility that emits air contaminants (e.g., furnaces, fuel burning equipment, boiler(s)) sized above the de minimus threshold levels in 310 CMR 7.02. In addition, if the building is to be equipped with emergency generators, additional review by the Department may be required depending on the size of the generator units. An emergency generator with an energy input capacity of less than 3 million BTU per hour is exempt from the requirements of 310 CMR 7.02. An emergency generator with an energy input capacity of more than 10 million BTU per hour requires pre-installation approval from the Department. A generator with a capacity between 3 million and 10 million BTU per hour must either follow the work practices in 310 CMR 7.03 or receive pre-installation approval under 310 CMR 7.02.

The MassDEP and EEA/DOER appreciate the opportunity to comment on this proposed project. Please contact Jack Zajac at John.Zajac@state.ma.us, (978) 694-3240 for further information on the wastewater issues, and Andrea Langhauser for waterways issues at Andrea.Langhauser@state.ma.us, (617) 348-4084. If you have further questions on GHG issues, the MassDEP contact is Philip.Weinberg@state.us, (617) 292-5972, and the DOER contact is Meg.Lusardi@state.ma.us, (617) 626-7364. If you have any general questions regarding these comments, please contact Nancy Baker, MEPA Review Coordinator at Nancy.Baker@state.ma.us, (978) 694-3338.

Sincerely,



John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Meg Lusardi, EEA/DOER
Phil Weinberg, John Felix, Andrea Langhauser, MassDEP-Boston
Kevin Brander, Jack Zajac, MassDEP-NERO
Richard McGuinness, BRA Senior Waterfront Planner, Jay O'Rourke, BRA Project Mgr
Bob Boeri, CZM Project Coordinator
Marianne Connolly, MWRA
John E. Sullivan, P.E. Boston Water and Sewer Commission

October 1, 2008

Ian A. Bowles, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114
Attention: Deirdre Buckley, MEPA Office

Re: Bulfinch Triangle Parcels 1B, 1C and 86-88 North Washington Street – The Merano
Environmental Notification Form, EEA #14304

Dear Secretary Bowles:

The City of Boston Environment Department has reviewed the Environmental Notification Form (ENF) and considered the Project Notification Form (PNF) and offers the following comments.

The proponent, Boston Development Group, proposes to construct a 463,000 square foot (sf) mixed use development to include about 190,000 sf (274 rooms) of a combined short-term and extended-stay hotel, about 206,000 sf of office space and approximately 10,000 sf of retail space on the ground floor and 13,000 sf of restaurant space on the second floor. The amount and configuration of parking that will be in a second floor parking garage is unclear – descriptions include a total of 203 with 93 double-stacked and 17 individual (135 net new), about 226 double-stacked parking spaces (158 net new) with no reference to individual spaces, 226 spaces with an unidentified number of stackers and 10 tandem spaces and 226 spaces double-stacked.

It appears from elevations in the ENF that the project is 14 stories and about 160 feet tall, including parapet and mechanical structures. Parcel 1B will be ground-leased to the proponent by the Massachusetts Turnpike Authority (MTA); Parcels 1C and 86-88 North Washington Street will be owned by affiliates of the proponent. The site is bounded by North Washington Street, Causeway Street, Beverly Street, Valenti Way and improved properties that front on Medford Street.

Zoning relief will be required for the hotel and accessory uses, parking accessory to the office use, Floor Area Ratio (FAR), height, setback and, potentially, other dimensional elements.

As landlocked tidelands, the project site is subject to the Waterways Act, M.G.L. c. 91. This, along with exceeding transportation thresholds, results in MEPA jurisdiction. The proponent is seeking a waiver from the mandatory Environmental Impact Report (EIR).

Pubic benefits are identified as, but no limited to:

- Reuse of a vacant site.
- Streetscape improvements to include plantings and trees.
- A pedestrian connection, through streetscaping and project-related activity, between the Rose Kennedy Greenway, Causeway Street and Portal Park.
- Activation of the project area.

- A donation of $12,000 for the Bulfinch Triangle Streetscape Improvement Initiative.
- A donation of $300,000 to the Boston Crossroads Initiative.
- A donation of $50,000 for the Bulfinch Triangle Traffic Study.
- LEED certifiability.
- The limitation of vehicle trips based upon transit accessibility and the number of project parking spaces.

The Boston Redevelopment Authority has approved the project. The proponent expects to begin construction during the first quarter of 2009. We understand that the hotels will be operated by the Marriott Hotels.

A draft LEED-NC checklist for the project shows that the proponent expects to achieve 29 credits, 14 are under consideration and 26 will not be sought. We look forward, in conjunction with BRA staff, to an updated checklist and detailed descriptions of the way in which credit requirements will be met.

Save That Stuff (617-241-9998), a Charlestown company, has recently initiated a composting program, one of the few available in the Boston area. We suggest that restaurant and other food service tenants consider participating in this program which will turn their organic waste into a useful product while helping to control waste removal costs and, when properly managed, assist with pest control.

The Boston-based, non-profit Green Restaurant Association (GRA) works with restaurants on issues including:

- Energy Efficiency & Conservation
- Water Recycling & Composting
- Sustainable Food
- Pollution Prevention
- Recycled, Tree-Free, Biodegradable & Organic Products
- Green Education

We ask that the proponent provide information about the GRA to restaurant tenants. The GRA Web site address is 'http://www.dinegreen.com/default'.

This department also recommends that the hotel operator contact Boston Green Tourism (BGT). BGT is dedicated to increasing tourism in Boston, reducing the operating costs to the industry in areas such as energy, water and waste disposal and showcasing to the public and media the environmental best practices employed by the visitor industry. The BGT can be contacted at bostongreentourism@usa.net or through Dan Ruben at 617-527-7950.

Please include on the Site Plan that will be submitted for review by the Boston Water and Sewer Commission (BWSC) the locations of permanent plaques which state, "Don't Dump - Drains to Boston Harbor." The plaques should be installed on the sidewalk adjacent to all existing, modified and new catch basins.

Native and adaptive plans species will be used to minimize demand for irrigation. The project will include a rainwater collection system for landscape irrigation.

The ENF indicates that groundwater recharge will approximate pre-existing conditions. We request that the proponent seek to recharge at a higher level.

Exterior lighting should meet safety needs while not contributing to light pollution. Fixtures should be shielded (full cut-off) and downward directed. We recommend as a resource, the Campaign for Dark Skies which can be accessed at 'http://www.britastro.org/dark-skies/goodvbad.htm'.

A pedestrian level wind study was not conducted although; the proponent indicated in the PNF that one would be conducted if requested by the BRA.

New shadow from the project will be cast on Portal Park on March 21, at 10:00 a.m., on June 21 at 9:00 a.m., on September 21 at 12:00 noon and on December 21 at 9:00 a.m. On September 21 at 9:00 a.m. almost all of Portal Park will be covered in new shadow.

The staff of the Boston Landmarks Commission (BLC) notes that the site of the proposed project is a mostly open parcel which has MBTA access, emergency egress and air shaft structures primarily located along Haverhill Street. The project site is in close proximity to several properties and districts listed in the *Inventory of Historic and Archaeological Assets of the Commonwealth* and are in the vicinity of the Bulfinch Triangle Historic District which is listed on the State and National Registers of Historic Places. The proposed development requires demolition of a one-story commercial building at 88 North Washington Street. The BLC reviewed a complete Article 85 Demolition Delay Review Application for the one-story commercial building at 88 North Washington Street and made a determination the building was "not significant."

The proposed new development is subject to review by the Massachusetts Historical Commission (MHC) and BLC in accordance with the Memorandum of Agreement (MOA) with the Federal Highway Administration (FHA) which requires that certain Central Artery/Tunnel (CA/T) parcels be subject to the Joint Development Guidelines drafted by the Massachusetts Department of Public Works (MA DPW), MHC, and BLC. T he proposed new development does not relate well to adjacent historic resources and surrounding historic context in height, massing, scale and detail. The drawings and renderings do not provide enough understanding of articulation of materials and details, or contextual information to provide more detailed comments. BLC staff looks forward to detailed review of the proposed redevelopment of Parcel 1B in consultation with MHC.

The BLC requests that dated cornerstones be incorporated into all new construction. This element will allow those who are attentive to and value the architecture of the City to appreciate the historical context in which structures were conceived.

The number, configuration and distribution of parking spaces for hotel, retail, restaurant and office uses should be clarified. If some spaces will be commercial, the number must be identified and spaces obtained from the Downtown Parking Freeze Bank administered by the Boston Air Pollution Control Commission (APCC). In any case, the proponent must seek an exemption from the APCC for spaces that will not be used for commercial purposes.

The ENF does not indicate if valet parking will be employed. Valet parking can result in air quality degradation due to idling. Management of parking at the project will determine the level of effect that tandem parking will have on air quality, pedestrian flows and vehicular circulation. This department, through the APCC, will look at the following elements when reviewing the application for the project:

- Expected arrival and departure numbers, particularly at peak times for various uses.
- Available queuing space.
- The potential for queuing that intrudes upon sidewalks and interferes with pedestrian movements.

- The potential for queuing that proceeds past the sidewalk and onto the street.
- The potential for violation of the Commonwealth's five-minute idle law.

The project will generate 2,044 vehicle trips per day (adjusted for mode split) and 1,780 new daily transit trips. Bicycle racks in secure, sheltered areas will be provided for employees and customers. Building tenants, hotel guests and retail/restaurant patrons will have the use of bicycle racks to be located in the second floor parking garage.

Projected mode shares for the project are:

- Office – 27 percent walk/bike, 30 percent transit, 43 percent auto
- Hotel/Retail – 54 percent walk/bike, 15 percent transit, 31 percent auto
- Restaurant – 54 percent walk/bike, 15 percent transit, 31 percent auto

The ENF does not indicate if walk trips are counted twice when an individual walks to the location where he/she will board a transit vehicle. As the practice varies from project to project, the method should be made explicit.

It would seem that 10,000 sf of retail is more than accessory to a hotel use and that combining the walk/bike split for a combined hotel/retail has yielded a walk/bike hotel mode share in excess of what will occur. Given the transit characteristics of the area, a comprehensive Transportation Demand Management (TDM) program should make it possible to reduce the 38 percent office auto share and 1.2 occupants per vehicle.

TDM is specified as a measure to avoid, minimize or mitigate greenhouse gas (GHG) emissions pursuant to EEA's GHG policy. The following measures are identified:

1. Location near transit.
2. Enforcement of the Commonwealth's five-minute idle law.
3. Work with a car-sharing service to determine the feasibility of reserving one or more parking spaces for this use.
4. Preferred parking for low-emitting and fuel efficient vehicles, carpools and vanpools.
5. New sidewalks to enhance pedestrian access around the site.
6. An on-site Transportation Coordinator to manage and oversee TDM programs.
7. A limited amount of on-site parking for hotel guests and employees.
8. Bicycle storage facilities for tenants, secure bicycle racks and on-site shower facilities.
9. Providing "transit and rideshare information to residents and employees."
10. Encouragement of carpooling and alternate commuting options.

Ensuring the permanent implementation of TDM during operation of the project is not addressed, details of implementation are not provided, measures number three and 10 are not commitments and the reference to residents in number nine is unclear. In order to be considered GHG mitigation, a TDM program must provide effective measures and environmental value. The proponent should expand a TDM program, require active tenant (hotel, retail and office) participation in the program through legal agreements and should monitor compliance. Tenant commitments should continue upon any sale of the building.

We suggest the following for the office, retail and restaurant uses:

- For access by MassRIDES vehicles, provide minimum clearance of 6-feet, 10 inches in the parking garage

- Join and actively participate in the A Better City Transportation Management Association (ABC TMA) for ridematching, car/vanpooling, Guaranteed Ride Home, Workout to Work and other programs.
- Transit pass subsidies for all employees, including contract workers, with a *pro rata* subsidy for part-time staff and subsidized transit reimbursement for *per diem* workers.
- Pre-tax payroll deduction for transit pass purchase.
- Post and on-site availability of public and private transit schedules with rate information.
- A transportation Web site.
- Provide the same information on Web sites and through e-mails, newsletters, at employee orientations and, periodically, with paychecks.
- If parking is a perquisite, offer a parking "cash out" option.
- Payroll deduction or subsidy for the purchase of bicycles and accessories for those enrolled and participating in a Workout to Work or similar program.
- Payroll deduction or subsidy for the purchase of athletic shoes for those enrolled and participating in a Workout to Work or similar program.
- Low cost, occasional parking for transit commuters who may sometimes need to drive.
- No parking subsidy.
- Parking rate structures that discourage commuter use.
- Participation in Zipcar's Z2B program, designed specifically for businesses, as a tenant amenity, an employee benefit or a part of standard business practice. With Zipcars available, those working in offices at the project who occasionally need a vehicle during the workday would not have to drive to work.

Additional measures appropriate for hotel guests are:

- Special arrangements with car rental agency to provide cars at the hotel so they need not be rented at and driven from the airport.
- On-site trip-planning assistance.
- Sending transit information (MBTA, water shuttle, etc.) and special car rental information to all who reserve a room and to all registrants of conferences or seminars to be held at hotel.
- Sell MBTA Day/Week LinkPasses at the hotel.

Some excess building materials from each building at the project may be suitable for donation to the Building Materials Resource Center (BMRC). The BMRC is a nonprofit building materials reuse project that accepts donations of good-quality used and surplus building materials and sells them to the public at low prices. Low- and moderate-income customers and nonprofits are eligible for a considerable discount on those prices. The BMRC also offers a wide range of homeowner support services, including home improvement classes, in-home consultations and a do-it-yourself window repair shop. The BMRC can be contacted at 617-442-8917.

According to the Massachusetts Department of Environmental Protection (DEP), about 33 percent of mobile source particulate matter (PM) and ten percent of all nitrogen oxide (NO_x) pollution in the northeast is caused by construction vehicles. More than 90 percent of diesel engine particulate emissions are highly respirable and carry toxins deep into the lung, exacerbating human respiratory ailments. The U. S. Environmental Protection Agency (EPA) has proposed classification of diesel exhaust as "highly likely to be carcinogenic in humans." It estimates that diesel engines currently on the road can run for 1,000,000 miles and remain in operation for as long as 20 to 30 years. This amounts to 160 to 240 tons of pollution over the life of each engine.

The use of flow-through filters and, diesel particulate filters on pre-2007 diesel vehicles can reduce air quality degradation caused by emissions of carbon monoxide (CO), volatile organic compounds (VOC), NO_x and air toxins generated by heavy-duty equipment. Oxidation catalysts and catalyzed particulate filters reduce toxic emissions of formaldehyde, benzene, acrolein and 1-3 butadiene by as much as 70 percent, decrease localized adverse impacts and reduce dust and odor complaints from project abutters and regulatory agencies. Experience with a pilot project that retrofitted 83 pieces of equipment working on the Central Artery/Tunnel (CA/T) project showed that:

- Vehicles did not experience significant power loss.
- There are no additional operation and maintenance (O & M) or fuel costs.
- Engine manufacturers continue to honor vehicle warranties.

We ask that all post-2007 diesel construction vehicles working on the project be retrofitted using retrofit technologies approved by the United States Environmental Protection Agency (EPA).

This department asks that the proposed TDM plan be augmented, particularly if it is part of GHG mitigation.

Thank you for the opportunity to offer comment.

Sincerely,

Bryan Glascock
Director

The Merano EENF #14304

APPENDIX C GREENHOUSE GAS EMISSIONS ANALYSIS AND SUSTAINABILITY

C.1 Greenhouse Gas Emissions Analysis

C.1.1 Introduction

In October 2007, EEA issued the MEPA Greenhouse Gas Emissions Policy and Protocol (GHG Policy). The GHG Policy applies to certain projects for which an ENF is submitted to MEPA after October 31, 2007. The GHG Policy was developed by a working group of public and private sector experts between April 2007 and October 2007. In broad terms, where applicable, the GHG Policy addresses direct emissions from stationary sources (e.g., fossil fuel emissions from on-site furnaces), indirect emissions from energy consumption (e.g., fuel usage for generation of electricity powering the Project), and indirect emissions from transportation (carbon dioxide (CO_2) emissions) from vehicles generated by the Project.

The GHG Policy addresses only CO_2 emissions at this time (later, it may address other greenhouse gases). With respect to the Project, CO_2 is considered the only significant GHG. To provide for consistency in the analysis, indirect emissions from transportation are limited to the mesoscale study area (see Section F.6 in Appendix F).

C.1.2 Methodology

The GHG Policy requires the proponent to calculate and compare GHG emissions associated with 1) a code-compliant baseline (Code Baseline); 2) the preferred alternative (Enhanced Design Alternative); and 3) project alternatives with greater GHG emissions-related mitigation than the preferred alternative (LEED GHG Mitigation). For all cases, the GHG emissions were calculated by estimating direct emissions from stationary sources, indirect emissions from energy consumption, and indirect emissions from Project generated traffic.

The Proponent has created the required three-tier GHG emission comparison. The Proponent has committed to develop the LEED GHG Mitigation scenario, which has the lowest GHG emissions of the three alternatives analyzed,. Scenario 2 (Enhanced Design Alternative) reflects a condition considerably better than the base case and results in greater GHG reductions. The Enhanced Design condition will be used for comparison to the code-compliant baseline case.

As discussed in Section C.2, the Proponent has identified numerous sustainable design elements for incorporation into the Project. The Proponent is also evaluating the feasibility of incorporating *additional* design elements to further mitigate GHG emissions. The additional elements being evaluated are renewable resources (e.g.

wind, solar, geothermal) along with incorporating a cogeneration plant to provide more efficient heating, cooling, and electrical supply.

C.1.3 Direct emissions from Stationary Sources

Calculation of direct emissions from stationary sources comprises the first part of the GHG Policy. For each of the conditions, this requires an assessment of the on-site energy requirements of the Project, including energy losses owing to heat loss and gain. As specified by the GHG Policy, energy modeling tools were used to estimate the energy demand for each condition. For this analysis the TRACE® 700V6 model was used to estimate energy demand for each of three conditions. The TRACE model is equivalent to other energy models like EQUEST and is accepted by the U.S. Green Building Council for application in LEED energy modeling projects. The estimated heating requirements predicted by TRACE for each condition were multiplied by the ISO-New England emission factor to determine CO_2 emissions in tons per year.

C.1.4 Indirect Emissions from Energy Usage

Calculation of indirect emissions comprises the second part of the GHG Policy. Indirect emissions result from the purchase and consumption of electricity by the Project. The electrical demand is affiliated with the lighting, building cooling, ventilation, and the operation of ancillary equipment. The GHG emissions associated with the electrical demand for the Project were estimated using the TRACE model to determine the kilowatt-hours required for each condition. The electrical demand was multiplied by the ISO-New England emission factor to determine CO_2 emissions in tons per year for each condition.

Table C-1 provides the assumptions built into the direct and indirect source modeling for the Code Baseline, the Enhanced Design and the LEED GHG Mitigation conditions.

Table C-1 GHG Study Modeling Assumptions

	Code Baseline Condition (ASHRAE 90.1)	Enhanced Design Condition	LEED GHG Mitigation Condition
Roof U value	0.065	0.043	0.033
Wall U value	0.084	0.08	0.06
Window U value	0.57	0.45	0.35
Window SHGC[1]	0.47	0.42	0.35
Lighting (W/SF)[2]	1.00	0.90	0.85
Gas DHW[3] (% efficiency)	80.0	85.0	85.0

Notes:
1. SHGC denotes solar heat gain coefficient.

2. W/SF denotes watts per square foot.
3. DHW denotes domestic hot water.

Other modeling assumptions were the following:

HVAC Systems – Code Baseline (ASHRAE 90.1)

For the office component, a variable air volume (VAV) system with hot water reheat served by standard air-cooled chillers at 1.173 kW per ton. Natural gas fired hot water boilers assumed at 80 percent efficiency.

For the hotel component, 1.12 kW per ton was assumed for the package terminal air conditioner (PTAC) system with hot water heat served by natural gas-fired hot water boilers operating at 80 percent efficiency. Standard rooftop electric cooling at 0.916 kW per ton, and natural gas-fired heating at 80 percent efficiency for corridor units ventilation.

HVAC Systems –Enhanced Design

For the office component, 1.107 kW per ton was assumed for the variable air volume (VAV) system with hot water reheat served by high efficient air-cooled chillers at 1.107 kW per ton. Natural gas fired hot water boilers assumed at 85 percent efficiency.

For the hotel component, 0.761 kW per ton was assumed for the water source heat pump system with hot water heat served by natural gas-fired hot water boilers operating at 85 percent efficiency. Standard rooftop electric cooling at 0.916 kW per ton, and natural gas-fired heating at 80 percent efficiency for corridor units ventilation.

HVAC Systems-LEED GHG Mitigation

For the office component, a VAV system with hot water reheat served by high efficiency air-cooled chillers at 0.493 kW per ton. Natural gas fired hot water boilers assumed at 96 percent efficiency.

For the hotel component, 0.761 kW per ton was assumed for the water source heat pump system with hot water heat served by natural gas-fired hot water boilers operating at 96 percent efficiency. Standard rooftop electric cooling at 0.916 kW per ton, and natural gas-fired heating at 80 percent efficiency for corridor units ventilation.

Table C-2 provides the energy demand requirements generated by the TRACE model for direct and indirect sources for each of the three conditions. The electrical energy is assumed generated off site, and addressed as indirect emissions, below, while natural gas consumption is assumed as direct emissions from the mechanical

equipment. The reductions presented in Table C-2 are based on a comparison of the Enhanced Design and the LEED GHG Mitigation Conditions to the Code Baseline Condition. As discussed earlier, the Project is evaluating the feasibility of a cogeneration system to provide more efficient heating, cooling and electrical needs. The TRACE energy modeling results for each condition are presented at the end of this appendix.

Table C-2 GHG Study Energy Requirements for Indirect and Direct Emissions

	Code Baseline Condition	Enhanced Design Condition	LEED GHG Mitigation Condition
Direct Emissions -Gas Consumption (Therms)			
Heating (10^6 Btu/yr)	35,858	32,443	30,396
Lbs of CO_2[1]	968,828	873,820	818,718
Lbs CO_2 Reduction		-95,008	-150,110
Tons CO_2 Reduction		-47.5	-75.1
Gas Percentage Reduction		-10.0%	-15%
Indirect Emissions -electricity (kW-hrs)			
Lights	1,560,150	1,404,134	1,326,127
Receptacles	780,075	780,075	780,075
Primary Cooling	1,004,664	1,022,377	1,056,489
Pumps /Auxiliary/Fans	716,817	1,026,656	560,802
Primary Heating	64,075	265,111	78,662
kWh Total	4,125,779	4,498,353	3,802,155
Lbs of CO_2[1]	379,263	413,535	349,521
kWh Reduction		+372,574	-323,624
Lbs CO_2 Reduction		+34,272	-29,742
Tons CO_2 Reduction		+17.1	-14.9
		+9%	-8%

[1] Emissions Factors used to estimate CO_2 emission based on the ISO New England Marginal Emissions Report using the average emissions factor in lb/MW-hr.

Direct Emissions from Stationary Sources

Table C-2 presents the estimated CO_2 emissions affiliated with direct emissions from stationary sources. The table shows that direct emissions from the Baseline condition are 968,828 pounds per year of GHG, or 484 tons per year (tpy). The Enhanced Design condition results in 437 tpy of GHG, a reduction of 47 tpy compared to the Baseline condition. The LEED GHG Mitigation condition results in 409 tons per year of GHG which is a reduction of 75 tpy compared to the Baseline, and 28 tpy compared to the Enhanced Design condition. This reduction is attributed to more efficient U values for the window, wall, and roof, along with greater boiler efficiency.

Indirect Emissions from Energy Consumption

In addition to the direct emissions, Table C-2 demonstrates that the Enhanced Design condition uses an annual total of 4,498,353 kilowatt hours (kW-hrs) of electricity compared with 4,125,779 kW-hrs for the Baseline condition. The increase in electrical usage for the Enhanced Design condition is attributed to higher electrical needs in space heating and auxiliary pumps. In contrast, the LEED GHG Mitigation condition uses 3,802,155 kW-hrs of electricity (a reduction due to the use of more efficient water cooled chillers, auxiliary fans and lighting). The LEED GHG Mitigation condition results in a reduction of 14.9 tpy of GHG emissions compared to the Baseline condition, and a reduction of 32 tpy compared to the Enhanced Design condition.

Indirect Emissions from Transportation

Consistent with the GHG Policy, indirect impacts from transportation were derived based on the mesoscale study area (see Section F.6 in Appendix F). Similar to the mesoscale study, GHG emissions from mobile sources were estimated for the Existing, No-Build and Build conditions. Regional emissions were estimated using the intersection criteria chosen for the mesoscale analysis along with the traffic volumes for each condition.

Emission rates of CO_2 were estimated for each condition using the MOBILE6.2 emission model. The MOBILE6.2 emission model was run consistent with the microscale and mesoscale analysis discussed in the earlier sections. MOBILE6.2 input parameters are provided at the end of Appendix F.

C.1.5 Baseline Conditions

Existing traffic conditions for 2008 were estimated for the baseline conditions. GHG emissions were estimated for existing conditions using existing traffic volumes, link lengths, and MOBILE6.2 generated emissions. Existing conditions were compared to the No-Build and Build conditions.

Table C-3 presents the GHG emissions for the existing conditions. ' The GHG emissions for Existing conditions are estimated at 30.1 tons per day or 10,969 tpy.

C.1.6 Future Conditions

GHG emissions were estimated for the future conditions (i.e. 2013) using future traffic volumes and MOBILE6.2 generated CO_2 emission rates. Table C-3 presents the GHG emissions for future No-Build and Build conditions. The future No-build conditions were estimated at 12,158 tpy compared to the Build Condition which were estimated at 12,337 tpy. The Build condition results in a slight increase of 1.5 percent over the No-Build, or 179.1 tpy. The Project has committed to extensive

traffic demand management (TDM) measures to mitigate the increase in "indirect" GHG emissions from the Project. These measures are highlighted below and also described in detail in Section D.3.3 in Appendix D of this ENF.

Table C-3 GHG Indirect Emissions from Transportation

Pollutant	Time	Units	Existing Condition	Full Build Condition	No-Build Condition	Build - No Build	% Difference (Build-No Build)
CO_2	Daily	Tons Per Day[1]	30.1	33.8	33.3	0.49	1.5%
	Annual	Tons Per Year[2]	10,969	12,337	12,158	179.1	1.5%

Notes:
1. Tons per day estimated by assuming the higher of the AM or PM hourly peak represents 10 percent of the daily totals.
2. Tons per year estimated by assuming tons per day multiplied by 365 days per year.

C.1.7 Total Project Impacts

Total Project impacts are the sum of direct emissions from mechanical equipment and indirect emissions affiliated with energy consumption and traffic generated by the Project. Results of the GHG analysis for the Project are presented in Table C-4.

Table C-4 Results of the GHG Analysis

Source	Code Baseline Case (TPY)	Enhanced Design Case (TPY)	LEED GHG Mitigation Case (TPY)
Indirect Emissions from Energy Demand Modeling	189	207	175
Direct Emissions from Stationary Sources	484	437	409
Indirect Emissions from Transportation1	12,337	12,337	12,337
TOTALS	13,010	12,981	12,921
Reduction below Code Baseline (tpy)	-0-	-29	-89

Notes: Indirect emissions from transportation based on the future build conditions.

C.1.8 Proposed Mitigation Measures

The GHG policy requires proponents to quantify the Projects GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. As discussed in Section C.2, Sustainability, sustainability elements have been incorporated into the Project to minimize adverse environmental impacts, conserve natural resources, and enhance the quality of life in the community. The Project will comply with Article 37 of the Boston Zoning Code on Green Buildings and is striving for LEED certification.

The GHG policy Appendix identifies suggested mitigation measures to reduce GHG emissions and is divided into the following three categories:

- Siting and Site Design;
- Building Design and Operation; and
- Transportation.

The sustainability elements proposed for the Project incorporate many of the suggested mitigation measures presented in the GHG policy Appendix. The following is a summary of the proposed mitigation measures for the Project. A more detailed discussion of the sustainability elements are presented in Section C.2, Sustainability.

Siting and Site Design

The following elements of the Siting and Site Design Mitigation Measures are incorporated into the Project:

- The Project is being developed consistent with the Commonwealth of Massachusetts Sustainable Development Principles;
- The Project is located on land which was previously developed and is not protected open space. There will be no impact to either wetland resources or agricultural land;
- The Project is located proximate to a transportation hub and proximate to existing commuter rail, subway, and bus lines;
- The Project will be designed to promote reduced automobile usage due to its proximity to existing transit stations. In addition, the Project will provide secure bicycle storage for five percent of all building users;

- A rainwater collection system will be used to minimize potable water usage for landscape irrigation. Native or adaptive plant species will be used to minimize demand for irrigation water.

Building Design and Operation

The following Building Design and Operation mitigation measures are incorporated into the Project:

- Light colored or vegetated roofs are planned, along with enclosed parking to reduce the urban heat island effect;

- Water efficient strategies will be incorporated, such as rainwater harvesting, native vegetation, low-flow plumbing fixtures, and the use of water and energy efficient technologies such as Energy Star appliances;

- Building energy options include building orientation (portions of the building elongated on the east/west axis to maximize passive solar heating in the winter). In addition, large expanses of double glazing around the entire building perimeter maximize opportunities for day lighting. The hotel units all will feature operable windows for day lighting and natural ventilation. Other options being explored include sun shading, insulation, high albedo roofing materials, and energy efficient mechanical, electrical, architectural, and structural systems. High efficiency HVAC systems along with Building Management Systems are being studied for all portions of the building;

- The Proponent is investigating the feasibility of a cogeneration system for waste heat recovery along with renewable technologies such geothermal heat/and or solar pumps/photo voltaics;

- Building materials and products will be reused where feasible. Raw materials with a minimum recycled content and the use of low emitting materials to improve indoor air quality will be preferred;

- Energy efficient lighting design is planned to maximize use of natural light and minimize power usage. Some of the technologies under consideration are fluorescent lighting, metal halide fixtures, LED fixtures, light shelves, daylight sensor and occupancy sensor controls;

- Refrigerants with both a low global warming potential and low ozone depletion factor will used;

- Energy performance in the building will attain a 14 percent reduction over the baseline code compliant case;

- Recycling will be promoted during construction. During occupancy, dedicated space for recycling will include adequate access for waste management vehicles; and

- A green housekeeping plan to mitigate indoor air contaminants will be implemented.

Transportation

The following elements of the Transportation Mitigation Measures are incorporated into the Project:

- The Project will be located near existing commuter rail and MBTA stations;

- The Proponent will enforce the state's five minute anti-idling regulations;

- The Proponent is looking into the feasibility of a shared car service to provide on-site parking spaces;

- Preferred parking will be provided for low emitting and fuel efficient vehicles, carpools, and vanpools;

- New sidewalks will be installed to enhance pedestrian access around the Project site;

- An on-site Transportation Coordinator will be designated to manage and oversee TDM programs;

- The Proponent is committed to a limited amount of on-site parking for hotel guests and employees;

- The Project includes bicycle storage facilities for tenants along with secure bicycle racks and on-site shower facilities;

- The Proponent will provide transit and rideshare information to residents and employees; and

- Carpooling and alternate commuting options will be encouraged.

A more detailed discussion of the transportation mitigation measures is presented in Appendix D.

C.1.9 Conclusion

Consistent with the MEPA GHG Policy, the Proponent has quantitatively addressed GHG emissions affiliated with both direct and indirect emissions from the Project.

The Proponent is committed to numerous building design elements and infrastructure improvements that will mitigate "direct" GHG emissions under the LEED GHG Mitigation condition (i.e. the Preferred Alternative). The LEED GHG Mitigation condition results in an overall reduction of 89 tpy compared to the Code Baseline condition, while the Enhanced Design condition results in a reduction of 29 tpy. Extensive traffic demand management (TDM) measures will also mitigate "indirect" GHG emissions from the Project. Further investigations will determine whether additional mitigation efforts such as the use of renewable energy sources or on-site cogeneration are feasible, thereby providing additional reductions in GHG emissions.

The Project is committed to these mitigation measures and believes the design elements proposed under both the Enhanced Design condition and the LEED GHG Mitigation condition reduce GHG emissions, thereby satisfying the MEPA GHG Policy.

C.2 Sustainability

The Proponent is committed to developing a sustainable project that uses resources efficiently, reduces impacts on its surroundings, and creates a beneficial environment for workers and visitors.

C.2.1 Transportation

The Project represents a Transit Oriented Development through the creation of a mixed-use development adjacent to a variety of transit choices. The Project is located adjacent to North Station, with access to four MBTA Commuter Rail lines and Amtrak service to New Hampshire and Maine. The North Station subway station is located one block away on Valenti Way and provides service on the Orange and Green Lines. In addition, MBTA bus service is located two blocks away in either direction on Canal Street and New Chardon Street. The bus service on Canal Street provides a connection to the MBTA Silver Line.

C.2.2 Smart Growth

Smart Growth is intended to draw attention and resources to restoring community vitality to city centers and older nearby suburbs. Smart growth and sustainable development principles that are embodied as part of the planning of the Project include:

- Concentrating development that is compact, integrates uses, and fosters a sense of place;
- Providing transportation choices;

- Increasing job opportunities near transportation options; and
- Planning regionally through the development of a project with regional benefits.

C.2.3 Leadership in Energy and Environmental Design

The Project will comply with Article 37 of the Boston Zoning Code on Green Buildings, which requires the Project to be certifiable under the Leadership in Energy and Environmental Design (LEED) program. In addition, the Proponent is committed to sustainable design and, as such, is exploring the potential for the Project to be LEED certified.

The LEED New Construction rating system (version 2.2) has been applied to the Project, and the current checklist is attached. The LEED checklist indicates that the Project scope includes approximately 29 credits, potentially achieving a Certified rating.

The Project's LEED scope and specific methodologies are still being investigated and reviewed. It is proposed that the Project will do the following to meet LEED prerequisites and achieve LEED credits:

- Develop a sediment and erosion control plan in conformance with U.S. Environmental Protection Agency guidelines;
- Not be developed on an inappropriate site per the criteria prohibited by the LEED program, such as farmland, undeveloped floodlands, wetlands, habitat for rare and endangered species, undeveloped land within 50 feet of a water body, or prior public parkland;
- Increase development density and community connectivity by constructing the Project on a previously developed site in an urban area with a density far exceeding the LEED minimum of 60,000 sf per acre net;
- Reduce pollution and land development impacts from automobile use by locating the Project adjacent to a transportation hub and within a block or two of existing commuter rail, subway, and bus lines;
- Reduce pollution and land development impacts from automobile use by providing secure bike storage for five percent of building users, providing shower and changing facilities for 0.5 percent of the full-time equivalent occupants, and by providing covered bike storage for 15 percent of building users in lieu of shower/changing facilities for the residential portion of the Project;

- Reduce pollution and land development impacts from automobile use by providing preferred parking for low-emitting and fuel-efficient vehicles for five percent of the total vehicle parking capacity;

- Reduce pollution and land development impacts from single occupancy vehicle use by providing preferred parking and drop off areas for carpools or vanpools for five percent of total provided parking spaces;

- Mitigate urban heat island effect by installing all parking within the building and installing a vegetative or light colored (high solar reflectance index) roof system;

- Reduce potable water consumption for landscape irrigation by utilizing native or adaptive species, using high efficiency irrigation systems, and recycling captured rainwater;

- Implement technologies to reduce water usage by 20 percent through the use of high efficiency/low flow water closets, urinals, lavatory faucets, showers, and kitchen sinks;

- Implement fundamental best practice commissioning procedures;

- Design the building to comply with ASHRAE/IESNA 90.1-2004 or the energy-related provisions of the Massachusetts State code, whichever is more stringent;

- Utilize refrigerants which have both a low global warming potential and a low ozone depletion factor;

- Reduce environmental and economic impacts associated with excessive energy use by optimizing energy performance and exceeding the baseline building performance rating per ASHRAE/IESNA 90.1-2004 by 14 percent;

- Reduce waste generated by building occupants and disposed of in landfills by providing an easily accessible storage area for the collection and storage of materials for recycling;

- Develop and implement a construction waste management plan in order to divert 75 percent of nonhazardous construction waste from disposal in landfills and incinerators to recycle and/or reuse materials;

- Use construction materials with recycled content, reducing impacts from extraction and processing of virgin materials;

- Use construction materials that are manufactured regionally, thereby supporting the use of local resources and reducing the environmental impacts from transportation of materials;

- Enhance indoor air quality by meeting the minimum requirements of ASHRAE 62.1-2004, Ventilation for Acceptable Indoor Air Quality or local code, whichever is more stringent;

- Minimize exposure of building occupants to environmental tobacco smoke by prohibiting smoking in public areas of the building, limit exterior smoking to at least 25 feet from entries, intakes and operable windows opening to common area, and sealing penetrations in walls, ceilings and floors between hotel units;

- Develop a construction indoor air quality management plan to reduce indoor quality problems resulting from construction to enhance the well-being of both construction works and future building occupants;

- Reduce the indoor air contaminants and enhance air quality for installers and occupants through the use of low-emitting materials, including adhesives and sealants, paints, carpet systems, and composite wood products;

- Minimize cross-contamination of regularly occupied areas by chemical pollutants;

- Provide a high level of lighting system control by occupants to promote productivity, comfort and well-being of building occupants;

- Institute a comprehensive transportation management plan that demonstrates a quantifiable reduction in personal automobile use through the offering of multiple alternative transportation methods;

- Institute a green housekeeping program;

- Develop a building environmental education program, including appropriate written materials and signage; and

- Encourage design integration through the inclusion of multiple LEED Accredited Professionals on the Project team, including architectural and engineer team members.

LEED for New Construction v2.2
Registered Project Checklist

Project Name: Parcel 1B, The Merano, Boston, Massachusetts
Project Address: Boston, Massachusetts

Yes	?	No			
8	2	4	**Sustainable Sites**		14 Points
Y			Prereq 1	**Construction Activity Pollution Prevention**	Required
1			Credit 1	**Site Selection**	1
1			Credit 2	**Development Density & Community Connectivity**	1
		1	Credit 3	**Brownfield Redevelopment**	1
1			Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
1			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
1			Credit 4.3	**Alternative Transportation**, Low-Emitting & Fuel-Efficient Vehicles	1
1			Credit 4.4	**Alternative Transportation**, Parking Capacity	1
		1	Credit 5.1	**Site Development**, Protect or Restore Habitat	1
	1		Credit 5.2	**Site Development**, Maximize Open Space	1
	1		Credit 6.1	**Stormwater Design**, Quantity Control	1
		1	Credit 6.2	**Stormwater Design**, Quality Control	1
1			Credit 7.1	**Heat Island Effect**, Non-Roof	1
1			Credit 7.2	**Heat Island Effect**, Roof	1
		1	Credit 8	**Light Pollution Reduction**	1

Yes	?	No			
2	2	1	**Water Efficiency**		5 Points
1			Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
	1		Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
		1	Credit 2	**Innovative Wastewater Technologies**	1
1			Credit 3.1	**Water Use Reduction**, 20% Reduction	1
	1		Credit 3.2	**Water Use Reduction**, 30% Reduction	1

2	4	11	**Energy & Atmosphere**		17 Points
Y			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Y			Prereq 2	**Minimum Energy Performance**	Required
Y			Prereq 3	**Fundamental Refrigerant Management**	Required

*Note for EAc1: All LEED for New Construction projects registered after June 26th, 2007 are required to achieve at least two (2) points under EAc1.

2	1	7	Credit 1	**Optimize Energy Performance**	1 to 10
				10.5% New Buildings or 3.5% Existing Building Renovations	1
				2 14% New Buildings or 7% Existing Building Renovations	2
				17.5% New Buildings or 10.5% Existing Building Renovations	3
				21% New Buildings or 14% Existing Building Renovations	4
				24.5% New Buildings or 17.5% Existing Building Renovations	5
				28% New Buildings or 21% Existing Building Renovations	6
				31.5% New Buildings or 24.5% Existing Building Renovations	7
				35% New Buildings or 28% Existing Building Renovations	8
				38.5% New Buildings or 31.5% Existing Building Renovations	9
				42% New Buildings or 35% Existing Building Renovations	10
		3	Credit 2	**On-Site Renewable Energy**	1 to 3
				2.5% Renewable Energy	1
				7.5% Renewable Energy	2
				12.5% Renewable Energy	3
	1		Credit 3	**Enhanced Commissioning**	1
	1		Credit 4	**Enhanced Refrigerant Management**	1
		1	Credit 5	**Measurement & Verification**	1
	1		Credit 6	**Green Power**	1

Yes	?	No			
4	3	6	**Materials & Resources**		13 Points
Y			Prereq 1	**Storage & Collection of Recyclables**	Required
		1	Credit 1.1	**Building Reuse**, Maintain 75% of Existing Walls, Floors & Roof	1
		1	Credit 1.2	**Building Reuse**, Maintain 100% of Existing Walls, Floors & Roof	1
		1	Credit 1.3	**Building Reuse**, Maintain 50% of Interior Non-Structural Elements	1
1			Credit 2.1	**Construction Waste Management**, Divert 50% from Disposal	1
1			Credit 2.2	**Construction Waste Management**, Divert 75% from Disposal	1
		1	Credit 3.1	**Materials Reuse**, 5%	1
		1	Credit 3.2	**Materials Reuse**,10%	1
1			Credit 4.1	**Recycled Content**, 10% (post-consumer + ½ pre-consumer)	1
	1		Credit 4.2	**Recycled Content**, 20% (post-consumer + ½ pre-consumer)	1
1			Credit 5.1	**Regional Materials**, 10% Extracted, Processed & Manufactured Regiona	1
	1		Credit 5.2	**Regional Materials**, 20% Extracted, Processed & Manufactured Regiona	1
		1	Credit 6	**Rapidly Renewable Materials**	1
	1		Credit 7	**Certified Wood**	1

Yes	?	No			
8	3	4	**Indoor Environmental Quality**		15 Points
Y			Prereq 1	**Minimum IAQ Performance**	Required
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Required
		1	Credit 1	**Outdoor Air Delivery Monitoring**	1
		1	Credit 2	**Increased Ventilation**	1
1			Credit 3.1	**Construction IAQ Management Plan**, During Construction	1
1			Credit 3.2	**Construction IAQ Management Plan**, Before Occupancy	1
1			Credit 4.1	**Low-Emitting Materials**, Adhesives & Sealants	1
1			Credit 4.2	**Low-Emitting Materials**, Paints & Coatings	1
1			Credit 4.3	**Low-Emitting Materials**, Carpet Systems	1
1			Credit 4.4	**Low-Emitting Materials**, Composite Wood & Agrifiber Products	1
1			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
1			Credit 6.1	**Controllability of Systems**, Lighting	1
	1		Credit 6.2	**Controllability of Systems**, Thermal Comfort	1
	1		Credit 7.1	**Thermal Comfort**, Design	1
		1	Credit 7.2	**Thermal Comfort**, Verification	1
		1	Credit 8.1	**Daylight & Views**, Daylight 75% of Spaces	1
	1		Credit 8.2	**Daylight & Views**, Views for 90% of Spaces	1

Yes	?	No			
5			**Innovation & Design Process**		5 Points
1			Credit 1.1	**Innovation in Design**: SS Credit 7.1 - 100% of parking is under cover	1
1			Credit 1.2	Innovation in Design: Education Program	1
1			Credit 1.3	**Innovation in Design**: SS 4.1 Alternative transit options	1
1			Credit 1.4	**Innovation in Design**: Green Housekeeping Program	1
1			Credit 2	**LEED® Accredited Professional: CBT, LEED Consultant, RWS**	1

Yes	?	No		
29	14	26	**Project Totals** (pre-certification estimates)	69 Points

Certified: 26-32 points, **Silver:** 33-38 points, **Gold:** 39-51 points, **Platinum:** 52-69 point

Merano

Energy Demand GHG Emissions

	Code Baseline	Enhanced Design	LEED GHG Mitigation
Indirect Emissions			
Kilowatt-Hours/year[1]	4125779	4498353	3802155
BTU-Year[1]	1.41E+10	1.54E+10	1.30E+10
Megawatts per Year	413	450	380
CO2 Pounds Per Year[2]	379262.57	413520.37	349521.6647
CO2 Tons Per Year	190	207	175
Direct Emissions			
Gas Usage (BTU/Year)	3.59E+10	3.24E+10	3.04E+10
Megawatts per Year	1051	951	891
CO2 Pounds Per Year[2]	965811.9	873820.32	818718.0305
CO2 Tons Per Year	483	437	409

Notes:
1. Derived from the TRACE Model results
2. Based on the ISO New England average emission rates.

R.W. Sullivan Engineering

HVAC . Electrical . Plumbing . Fire Protection . Code

MEMO

Date: July 29, 2008 **RWS Project #: 1896.00**

Project Name: The Merano – Boston, MA

To: Laura Rome, Geoff Starsiak – Epsilon Associates

Subject: Green House Gas Modeling Assumptions

CC: Rick Wakeman - BDG

Prepared by: Quy Vu

Following is the summary of our assumptions for the building envelope, lighting, domestic hot water systems and HVAC systems in the green house gas modeling.

	Baseline (ASHRAE 90.1)	Enhanced Alternative	Project Alternative (LEED)
Roof U value	0.065	0.043	0.033
Wall U value	0.084	0.08	0.06
Window U value	0.57	0.45	0.35
Window SHGC	0.47	0.42	0.35
Lighting (W/SF)	1.00	0.90	0.85
Gas DHW (% efficiency)	80.0	85.0	85.0

HVAC Systems - Baseline (ASHRAE 90.1)

Office tower – VAV system with hot water reheat served by standard air-cooled chillers (1.173 kW/ton) and gas-fired hot water boilers (80% efficient).

Hotel tower – PTAC system (1.12 kW/ton) with hot water heat served by gas-fired hot water boilers (80% efficient) and standard rooftop electric cooling (0.916 kW/ton), gas fired heating (80% efficient) units for corridor ventilation.

HVAC Systems - Enhanced Alternative

Office tower – VAV system with hot water reheat served by high efficiency air-cooled chillers (1.107 kW/ton) and gas-fired hot water boilers (85% efficient).

Hotel tower – Watersource heat pump system (0.761 kW/ton) with hot water heat served by gas-fired hot water boilers (85% efficient) and standard rooftop electric cooling (0.916 kW/ton), gas fired heating (80% efficient) units for corridor ventilation.

HVAC Systems – Project Alternative (LEED)

Office tower – VAV system with hot water reheat served by high efficiency water-cooled chillers (0.493 kW/ton) and gas-fired hot water boilers (96% efficient).

Hotel tower – Watersource heat pump system (0.761 kW/ton) with hot water heat served by gas-fired hot water boilers (96% efficient) and standard rooftop electric cooling (0.916 kW/ton), gas fired heating (80% efficient) units for corridor ventilation.

Energy Cost Budget / PRM Summary

By R.W. Sullivan

roject Name: The Merano	Date: July 29, 2008
ity: Boston	Weather Data: Boston, Massachusetts

ote: The percentage displayed for the "Proposed/ Base %" lumn of the base case is actually the percentage of the tal energy consumption.

Denotes the base alternative for the ECB study.

		* Alt-2 Baseline ASHRAE 90-1			Alt-1 Project Alternative - LEED			Alt-3 Enhanced Alternative		
		Energy 10^6 Btu/yr	Proposed / Base %	Peak kBtuh	Energy 10^6 Btu/yr	Proposed / Base %	Peak kBtuh	Energy 10^6 Btu/yr	Proposed / Base %	Peak kBtuh
ighting - Conditioned	Electricity	5,324.8	11	1,249	4,526.1	85	1,062	4,792.3	90	1,124
pace Heating	Electricity	218.7	0	94	268.5	123	56	904.8	414	339
	Gas	35,858.6	72	13,742	30,396.8	85	6,489	32,442.6	90	10,851
pace Cooling	Electricity	2,937.8	6	2,950	2,230.1	76	1,386	2,461.1	84	2,456
umps	Electricity	994.0	2	611	1,923.5	194	545	2,445.1	246	819
leat Rejection	Electricity	491.2	1	375	256.1	52	164	160.3	33	199
ans - Conditioned	Electricity	1,452.5	3	1,457	1,110.2	76	1,122	1,926.8	133	1,473
eceptacles - Conditioned	Electricity	2,662.4	5	625	2,662.4	100	625	2,662.4	100	625
otal Building Consumption		49,939.8			43,373.6			47,795.5		

		* Alt-2 Baseline ASHRAE 90-1	Alt-1 Project Alternative - LEED	Alt-3 Enhanced Alternative
otal	Number of hours heating load not met	322	0	339
	Number of hours cooling load not met	405	83	171

	* Alt-2 Baseline ASHRAE 90-1		Alt-1 Project Alternative - LEED		Alt-3 Enhanced Alternative	
	Energy 10^6 Btu/yr	Cost/yr $/yr	Energy 10^6 Btu/yr	Cost/yr $/yr	Energy 10^6 Btu/yr	Cost/yr $/yr
lectricity	14,081.3	830,351	12,976.8	733,076	15,352.9	904,712
as	35,858.6	394,444	30,396.8	334,365	32,442.6	356,869
otal	49,940	1,224,795	43,374	1,067,441	47,795	1,261,580

ENERGY CONSUMPTION SUMMARY

By R.W. Sullivan

	Elect Cons. (kWh)	Gas Cons. (kBtu)	Water Cons. (1000 gals)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
ıative 1						
ıry heating						
ary heating	5,977	30,396,838		70.1 %	30,417,236	32,057,874
ır Htg Accessories	72,685			0.6 %	248,075	744,300
leating Subtotal	**78,662**	**30,396,838**		**70.7 %**	**30,665,312**	**32,802,174**
ıry cooling						
ing Compressor	653,184			5.1 %	2,229,316	6,688,618
er/Cond Fans	75,026		3,808	0.6 %	256,064	768,269
denser Pump	328,063			2.6 %	1,119,678	3,359,371
ır Clg Accessories	217			0.0 %	740	2,219
ooling Subtotal....	**1,056,489**		**3,808**	**8.3 %**	**3,605,798**	**10,818,476**
iary						
ply Fans	325,290			2.6 %	1,110,216	3,330,981
ps	235,511			1.9 %	803,799	2,411,640
d-alone Base Utilities				0.0 %	0	0
ux Subtotal....	560,802			4.4 %	1,914,016	5,742,621
ing						
ting	1,326,127			10.4 %	4,526,073	13,579,576
ptacle						
eptacles	780,075			6.1 %	2,662,395	7,987,985
neration						
eneration				0.0 %	0	0
s						
als**	**3,802,155**	**30,396,838**	**3,808**	**100.0 %**	**43,373,594**	**70,930,832**

lote: Resource Utilization factors are included in the Total Source Energy value.
lote: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

ct Name: The Merano
set Name: J:\2006 1400-1919\12 DECEMBER 1860-1919\1896-00\HVAC\TRACE\ENERGY MODEL\1896_MERANO_07-29-08.TRC

ENERGY CONSUMPTION SUMMARY

By R.W. Sullivan

	Elect Cons. (kWh)	Gas Cons. (kBtu)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
ıative 2					
ary heating					
ıary heating		35,858,552	71.8 %	35,858,552	37,745,844
ɜr Htg Accessories	64,075		0.4 %	218,686	656,124
leating Subtotal	**64,075**	**35,858,552**	**72.2 %**	**36,077,238**	**38,401,968**
ary cooling					
ling Compressor	858,667		5.9 %	2,930,629	8,792,766
er/Cond Fans	143,909		1.0 %	491,162	1,473,635
denser Pump			0.0 %	0	0
ɜr Clg Accessories	2,088		0.0 %	7,125	21,378
:ooling Subtotal....	**1,004,664**		**6.9 %**	**3,428,917**	**10,287,779**
ıiary					
ply Fans	425,586		2.9 %	1,452,523	4,358,006
ıps	291,231		2.0 %	993,973	2,982,217
ıd-alone Base Utilities			0.0 %	0	0
\ux Subtotal....	716,817		4.9 %	2,446,496	7,340,222
ting					
ıting	1,560,150		10.7 %	5,324,791	15,975,969
ptacle					
eptacles	780,075		5.3 %	2,662,395	7,987,985
ɜneration					
ɜneration			0.0 %	0	0
ls					
als**	**4,125,779**	**35,858,552**	**100.0 %**	**49,939,837**	**79,993,920**

Note: Resource Utilization factors are included in the Total Source Energy value.
Note: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

ect Name: The Merano
set Name: J:\2006 1400-1919\12 DECEMBER 1860-1919\1896-00\HVAC\TRACE\ENERGY MODEL\1896_MERANO_07-29-08.TRC

ENERGY CONSUMPTION SUMMARY

By R.W. Sullivan

	Elect Cons. (kWh)	Gas Cons. (kBtu)	Water Cons. (1000 gals)	% of Total Building Energy	Total Building Energy (kBtu/yr)	Total Source Energy* (kBtu/yr)
ıative 3						
ıry heating						
ary heating	112,891	32,442,614		68.7 %	32,827,909	35,306,124
ır Htg Accessories	152,221			1.1 %	519,530	1,558,745
eating Subtotal	**265,111**	**32,442,614**		**69.8 %**	**33,347,439**	**36,864,868**
ıry cooling						
ing Compressor	719,603			5.1 %	2,456,004	7,368,747
ər/Cond Fans	46,969		2,226	0.3 %	160,304	480,961
ıenser Pump	254,316			1.8 %	867,980	2,604,201
ır Clg Accessories	1,490			0.0 %	5,084	15,253
ooling Subtotal....	**1,022,377**		**2,226**	**7.3 %**	**3,489,372**	**10,469,161**
iary						
ɔly Fans	564,562			4.0 %	1,926,849	5,781,125
ps	462,094			3.3 %	1,577,127	4,731,855
d-alone Base Utilities				0.0 %	0	0
ux Subtotal....	1,026,656			7.3 %	3,503,976	10,512,979
ing						
ting	1,404,134			10.0 %	4,792,310	14,378,368
ptacle						
eptacles	780,075			5.6 %	2,662,395	7,987,985
neration						
eneration				0.0 %	0	0
s						
als**	**4,498,353**	**32,442,614**	**2,226**	**100.0 %**	**47,795,493**	**80,213,360**

lote: Resource Utilization factors are included in the Total Source Energy value.
lote: This report can display a maximum of 7 utilities. If additional utilities are used, they will be included in the total.

ct Name: The Merano
set Name: J:\2006 1400-1919\12 DECEMBER 1860-1919\1896-00\HVAC\TRACE\ENERGY MODEL\1896_MERANO_07-29-08.TRC

Buckley, Deirdre (EEA)

From: Rome, Laura [lrome@epsilonassociates.com]
Sent: Thursday, September 18, 2008 10:21 AM
To: Buckley, Deirdre (ENV)
Subject: The Merano – GHG Table
Attachments: GHG Table.doc

<<GHG Table.doc>>
Deirdre, as we discussed at the consultation meeting for the Merano project, attached is a revised table showing the percentage change in GHG emissions.

Give me a shout if you need anything else.

Thanks.

Laura

Laura Rome • Associate • Epsilon Associates, Inc.
3 Clock Tower Place, Suite 250, Maynard, MA 01754
p | **978.461.6226** **f |** 978.897.0099 **e |** lrome@epsilonassociates.com **w |** www.epsilonassociates.com

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Deval L. Patrick
GOVERNOR

Timothy P. Murray
LIEUTENANT GOVERNOR

Ian A. Bowles
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

December 29, 2008

FINAL RECORD OF DECISION

PROJECT NAME	: The Merano
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 14304
PROJECT PROPONENT	: Boston Development Group
DATE NOTICED IN MONITOR	: October 8, 2008

Pursuant to the Massachusetts Environmental Policy Act (MEPA) (G.L.c.30, ss. 61-62I) and Section 11.11 of the MEPA regulations (301 CMR 11.00), I have reviewed the Expanded Environmental Notification Form (ENF) and hereby **grant a waiver** from the requirement to prepare a mandatory Environmental Impact Report (EIR). In a separate Certificate issued on October 3, 2008, I set forth the outstanding issues related to the project that can be addressed by permitting agencies.

Project Description

As described in the EENF, the project consists of the design and construction of a 463,000 square foot (sf) mixed use development in Boston, MA. The project includes approximately 190,000 sf of hotel uses (short-term and long-term), 206,000 sf of office space, 10,000 sf of retail and 13,000 sf of restaurant space. It will include a parking garage on the second floor that will provide 203 spaces (93 double stacked and 17 single). The project requires demolition of a one-story commercial building at 88 North Washington Street.

The project site includes Parcel 1B, Parcel 1C and 86-88 Washington Street. Parcel 1B was created by the demolition of the elevated I-93 highway structures and is owned by the Massachusetts Turnpike Authority (MTA). The proponent was designated as the developer of this parcel by the MTA following a public Request for Proposal process that included public

presentations and meetings. The proponent will lease the property from MTA through a ground lease. Parcel 1C and 86-88 Washington Street are owned or will be owned by the proponent.

The 1.26-acre site is bounded by Causeway Street, Beverly Street, Valenti Way, North Washington Street and buildings along Medford Street, including 239 Causeway Street and 98 North Washington Street. It is in close proximity to the Massachusetts Bay Transportation Authority (MBTA) Green Line and Orange Line and the commuter rail at North Station. The parcel, which is located over MTA tunnels, is vacant with the exception of an area used for surface parking. It is located on landlocked tidelands approximately 415 feet from the shoreline of Boston Inner Harbor and within the City of Boston Groundwater Conservation Overlay District. The site is located immediately adjacent to the Causeway/North Washington Street District, which is eligible for listing on the National Register of Historic Places. It is located in the vicinity of the Bulfinch Triangle District, which is listed in the State and National Registers of Historic Places and in the vicinity of the North End Area, an area included in the Inventory of Historic and Archaeological Assets of the Commonwealth.

Permitting/Jurisdiction

The project is undergoing MEPA review and subject to preparation of a Mandatory EIR pursuant to 11.03 (6)(a)(6) because it requires a state permit and will generate 3,000 or more new average daily vehicle trips (adt) on roadways providing access to a single location. The project requires a Sewer Connection Permit from the Massachusetts Department of Environmental Protection (MassDEP), a long-term ground lease from the MTA and review by the Massachusetts Historical Commission (MHC). The project may require authorization from the Executive Office of Transportation and Public Works (EOTPW) for use of former railroad right of way (ROW). The project is subject to the MEPA Greenhouse Gas Emissions Policy and Protocol and will require a Public Benefits Determination for use of landlocked tidelands. Also, it requires a Sewer Use Discharge Permit and Construction Dewatering Permit from the Massachusetts Water Resources Authority (MWRA).

The project is subject to Article 80 Large Project Review by the Boston Redevelopment Authority (BRA) pursuant to Article 80 of the Boston Zoning Code. The BRA issued a decision on the Project Notification Form (PNF) on September 23, 2008 indicating that no further review was required. In addition, it requires multiple permits and reviews by the City of Boston including development and review of a Construction Management Plan and a Transportation and Access Plan Agreement by the Boston Transportation Department (BTD). The project will require zoning relief including relief for dimensions and setback requirements as well as the proposed hotel and parking.

Because the proponent is seeking a land transfer in the form of a ground lease, MEPA jurisdiction extends to those aspects of the project within the area subject to the land transfer that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations. Pursuant to 301 CMR 11.01(2)(a)(3), MEPA subject matter jurisdiction is functionally equivalent to full scope jurisdiction.

Summary of Potential Environmental Impacts

Potential environmental impacts associated with the project include the generation of approximately 2,044 adjusted adt, use of 63,701 gallons per day (gpd) of water, generation of 57,910 gpd of wastewater and non-water dependent use of landlocked tidelands.

Summary of Proposed Mitigation Measures

The EENF and supplemental information dated December 10, 2008 identify the project's consistency with the Commonwealth's Sustainable Development Principles and describe the following measures to avoid, minimize and mitigate environmental impacts:

- re-development of a vacant lot located in close proximity to transit;
- design and construction of a building that is certifiable by the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) at the Silver level and which will lower the project's energy use by at least 14% from the ASHRAE 90.1-2004 standard;
- measures to minimize GHG emissions associated with the project including high albedo roofing, high efficiency HVAC systems, daylighting, energy efficient lighting, refrigerants with a low global warming potential, dedicated space for recycling infrastructure, use of construction materials with recycled content, use of regionally manufactured construction materials, duct sealing, water conservation measures and fundamental building commissioning performed by a third-party;
- provision of adequate pedestrian access around and through the site including wide sidewalks, lighting and street furniture;
- creation of a plaza at the Causeway Street/Beverly Street corner of the site;
- development of a Transportation Demand Management (TDM) program and provision of a limited parking supply to minimize vehicle trips;
- discounted parking rates for drivers of low-emitting, fuel efficient vehicles;
- support for streetscape improvements including a $300,000 contribution to the City of Boston Crossroads Initiative; and
- support for additional traffic analysis including $50,000 for a comprehensive study of the Bulfinch Triangle neighborhood.

Waiver Request

The proponent has requested a Waiver of the requirement to prepare an EIR. An EENF was submitted in conjunction with this request and it was subject to an extended comment period as required. The EENF identifies the environmental impacts of the project and describes measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts. The Waiver request was discussed at the scoping session for the project which was held on September 10, 2008.

A Draft Record of Decision (DROD) was issued on October 3, 2008 and published in the

October 8, 2008 edition of the Environmental Monitor in accordance with 301 CMR 11.15(2). It was subject to an extended comment period which ended on December 22, 2008. As a condition of the DROD, the proponent was required to provide supplemental analysis of Greenhouse Gas (GHG) emissions and mitigation measures associated with the project. Supplemental information, dated December 10, 2008, was provided to the MEPA Office and to all individuals and organizations that commented on the EENF.

Standards for All Waivers

The MEPA regulations at 301 CMR 11.11(1) state that I may waive any provision or requirement in 301 CMR 11.00 not specifically required by MEPA and may impose appropriate and relevant conditions or restrictions, provided that I find that strict compliance with the provision or requirement would:

(a) Result in an undue hardship for the Proponent, unless based on delay in compliance by the Proponent; and,

(b) Not serve to avoid or minimize Damage to the Environment.

Determinations for an EIR Waiver

The MEPA regulations at 301 CMR 11.11(3) state that, in the case of a waiver of a mandatory EIR review threshold, I shall at a minimum base the finding required in accordance with 301 CMR 11.11(1)(b) stated above on a determination that:

(a) The project is likely to cause no Damage to the Environment; and,

(b) Ample and unconstrained infrastructure facilities and services exist to support those aspects of the project within subject matter jurisdiction.

Findings

Based upon the information submitted by the Proponent, consultation with the relevant state agencies, and comment letters submitted on the project, I find that the Waiver request has merit and that the Proponent has demonstrated that the proposed project meets the standards for all waivers at 301 CMR 11.11(1).

As noted previously, the EENF identified the environmental impacts of the project and identified the project's consistency with the Commonwealth's Sustainable Development Principles. The EENF included a traffic study, a GHG analysis and described measures to be undertaken by the proponents to avoid, minimize and mitigate project impacts including commitments to minimize GHG emissions.

State agency action associated with the project is limited to the issuance of a Sewer Connection Permit by MassDEP and a ground lease by MTA. State agency comments do not identify concerns with the granting of the waiver request. The proponent has addressed adequately the comments on the EENF related to GHG emissions and mitigation measures. The revised GHG analysis includes additional analysis of on-site renewables, cogeneration and enhanced building commissioning and provides clarification of commitments identified in the EENF. Additional and/or enhanced mitigation measures include a commitment to measures that will qualify the project for LEED Certification at the Silver level (compared to the Basic level identified in the EENF), third-party building commissioning and duct sealing. The proponent has evaluated incorporation of a solar photovoltaic (PV) system or a combined heat and power (CHP) cogeneration system but deemed it infeasible. One significant constraint identified is that the project is located on NSTAR's spot network and, therefore, limited to an inverter based distributed generation system (DG) up to a maximum of 15kw which is approximately .25% of the project's anticipated electrical load. The revised GHG analysis clarifies the proponent's commitment to water conservation and provides an estimate of associated GHG emissions reductions. It indicates that it will use low-flow fixtures that can reduce water demand by 30% as compared to the Energy Policy Act of 1992 compliant fixtures or 2,373,707 gallons per year (gpy). Based on the formula provided by MassDEP, use of low-flow fixtures will reduce CO2 emissions by 4,558 pounds per year or 2.3 tons per year (tpy).

The EENF and supplemental filings contains sufficient information to allow state agencies to understand the environmental consequences of its permit decision.

MHC, as the State Historic Preservation Officer, has reviewed the project as required by the "joint development" process of the Central Artery/Tunnel (CA/T) Project and the associated Memorandum of Agreement (MOA). Comments from MHC note that the proposed buildings exceed the height limits established by the JDG and indicate that the project will have an adverse effect on the Bulfinch Triangle and Causeway/North Washington Street historic districts through the introduction of visual elements that are out of character with and alter the setting of these historic districts. MHC comments request consideration of design alternatives for the proposed height and massing. The MHC comment letter does not identify concerns with the granting of a waiver.

Comment letters on the EENF from the Downtown North Association (DNA) and the Bulfinch Triangle Community Advisory Committee (BTCAC) express strong support for the project and the Waiver. Comments from the Boston Groundwater Trust provided to the BRA (dated July 23, 2008) do not identify any significant concerns with the impact of the project on groundwater levels.

As noted previously, the categorical requirement to prepare an EIR is based on exceedance of a transportation threshold. Trip generation is estimated at over 3,000 adt based on the Institute of Transportation Engineers (ITE) Trip Generation Manual. According to the EENF, adjusting this estimate using BTD mode shares, results in an estimate of 2,044 adt. This estimate is lower than the mandatory EIR threshold of 3,000 adt. In addition, the trip generation and traffic impacts of the project have been reviewed by the City and BTD through the BRA Article 80 process. This review has resulted in a design that incorporates measures routinely required or

encouraged through MEPA review including a low parking ratio, development of an effective TDM program and adequate pedestrian and bicycle infrastructure.

Based on the foregoing, I find that preparation of an EIR is not necessary in order for the proponent to demonstrate that it will avoid, minimize, and mitigate potential Damage to the Environment to the maximum extent practicable. Strict compliance with the requirement to prepare an EIR would therefore cause undue hardship and would not serve to minimize Damage to the Environment.

I also find that compliance with the requirement to prepare an EIR for the project would not serve to avoid or minimize Damage to the Environment. In accordance with 301 CMR 11.11(3), this finding is based on my determination that:

1. The project is likely to cause no Damage to the Environment:

- The project consists of redevelopment of a vacant lot. The site does not contain any significant natural resources or protected open space or parkland. Adequate mitigation will be provided for impacts to landlocked tidelands, transportation, wastewater and historic resources.

- The project is consistent with the Commonwealth's Sustainable Development Principles and is designed to be LEED certifiable at the Silver level. In addition, the proponent has conducted a GHG analysis as required and committed to measures to reduce GHG emissions.

2. Ample and unconstrained infrastructure facilities and services exist to support those aspects of the project within subject matter jurisdiction:

- MassDEP and MWRA indicate that measures to eliminate extraneous clean water from the sewer system (infiltration/inflow (I/I)) can and should be provided to address any potential impacts to the wastewater infrastructure.

- Adequate pedestrian circulation is provided around and through the site and contributions to the Crossroads Initiative will improve pedestrian access and safety along Causeway Street.

- The project was approved by the BRA on September 23, 2008, thereby indicating that the project has provided an adequate description of and mitigation for potential community impacts.

3. The proposal to grant the Waiver is conditioned on the following to ensure the environmental impacts of the project are minimized:

- The proponent must provide a certification to the MEPA Office signed by an appropriate consultant (e.g., engineer, architect, general contractor) indicating that the mitigation measures identified in the EENF and the December 10, 2008 supplemental GHG analysis,

or other measures sufficient to achieve at least a 13% reduction in stationary source GHG emissions compared to the Baseline Condition, have been incorporated into the project. The certification should be supported by as-built plans. For those measures that are operational in nature (i.e. TDM, recycling) the proponent should provide a plan identifying the measures, the schedule for implementation and how progress towards achieving measures will be obtained.

- The proponent will remove or cause to be removed approximately 235,640 gpd of I/I from the wastewater system.

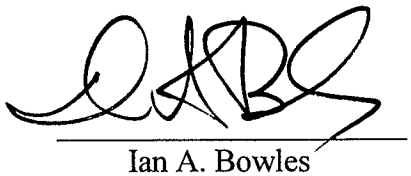
- The proponent will consult with MHC regarding alternatives to the proposed building design and massing and will provide more detailed elevation drawings which depict proposed materials and will provide sketches or more detailed descriptions of the proposed fenestration reveals as well as depths/dimensions of other applied or structural exterior details.

- Consistent with Article 32, Section 6 of the Boston Zoning Code, the proponent will certify that the project will not negatively impact groundwater levels on the site or on adjacent lots.

- The proponent will participate in the MassDEP Diesel Retrofit Program to mitigate the construction-period impacts of diesel emissions to the maximum extent feasible. The proponent will require contractors to retrofit construction vehicles with after-engine emission controls such as diesel oxidation catalysts (DOCs) and/or diesel particulate filters (DPFs) that are verified by the U.S. Environmental Protection Agency (EPA).

Conclusion

I have determined that this waiver request has merit, and issued a Draft Record of Decision (DROD), which was published in the Environmental Monitor on October 8, 2008 in accordance with 301 CMR 11.15 (2), which began the public comment period. The DROD was subject to an extended public comment period that ended on December 22, 2008. I hereby **grant** the waiver requested for this project, from the requirement to prepare a mandatory Environmental Impact Report (EIR), subject to the above findings and conditions.



December 29, 2008
Date

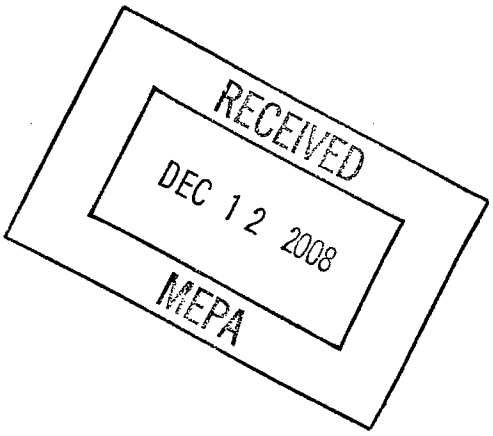
Ian A. Bowles

No comments received

IAB/CDB/cdb

Epsilon
ASSOCIATES INC.

DB



2026/Merano ENF/DROD Response

December 10, 2008

Ian A. Bowles, Secretary
Executive Office of Energy and
Environmental Affairs
Attn: Deirdre Buckley, MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114

Subject: EEA #14304 – The Merano, Boston

Dear Secretary Bowles:

In response to the Draft Record of Decision (DROD) proposing to grant a waiver of the requirement to file an Environmental Impact Report for The Merano Project, Epsilon Associates, Inc. is providing this letter to address the issues outlined in the DROD and the Massachusetts Department of Environmental Protection (MassDEP) comment letter dated September 26, 2008. Our responses are provided below.

The Proponent appreciates your willingness to grant a waiver, as expressed in the DROD, in particular in light of the Proponent's eagerness to get underway before nationwide economic conditions worsen.

The DROD and MassDEP comment letter have asked for more information in regard to energy efficiency and associated greenhouse gas emissions. The location of the Project already limits indirect emissions, since it is proximate to transit. The Project is located in a densely developed environment suitable for walking and biking and has a low parking ratio (0.44 spaces per 1,000 sf).[1] The Proponent notes that to meet the requirements of LEED (Leadership in Energy and

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[1] In addition, parking rates will be discounted for drivers of low-emitting, fuel-efficient vehicles (so identified by the American Council for an Energy-Efficient Economy).

Environmental Design), through which it is seeking LEED Silver Certification,[2] and Article 37 of the Boston Zoning Code, the Project will meet efficiency standards beyond those required by the State Building Code, which itself is stringent regarding efficiency. In addition, the Proponent is evaluating additional measures to further increase efficiency and decrease greenhouse gas (GHG) emissions related to the Project.

Greenhouse Gas Reduction

As described below, the Proponent is committed to minimizing the Project's GHG emissions. At this early stage in the Project's design, however, the Proponent is not able to commit to all of the potential GHG reduction measures that the Project will eventually include. The Proponent has committed to achieve energy use reductions necessary for the Project to gain two LEED points, as shown on the LEED checklist included in the Expanded Environmental Notification Form, requiring that the Project's energy use be at least 14 percent lower than the ASHRAE 90.1-2004 standard. Obtaining the points involves a balancing of building elements that affect energy use, such as building lighting, glazing, insulation and HVAC systems. Such building elements proposed for the Project were included in the GHG emissions analysis provided in the ENF, but are detailed below for clarification. As described below, the Proponent has made commitments to measures where the costs and benefits to the Project are already well understood. Other measures that remain under consideration are also described below.

Lighting

The Proponent anticipates using the most efficient lighting feasible, and incandescent lights will be kept to a minimum. The commitments stated below were included in the GHG emissions analysis provided in the ENF. The lighting for the Project will be as follows:

- The majority of lighting fixtures will have efficiencies of 70% or greater.

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[2] At the time of the submittal of the Expanded ENF, the Proponent had committed to measures sufficient to reach basic LEED certification. Since that time, the Proponent has committed to an additional seven points, which potentially qualify the Project for LEED Silver certification.

- Most of the hotel unit fixtures will be fluorescents. The interior designer for the hotel guestrooms will be encouraged by Marriott to specify compact fluorescent lighting. Marriott is granted the right to develop the room specifics in the granting license agreement.

- The mechanical and electrical rooms, recycling room, bike storage, elevator machine room, water service room and fire pump room will be illuminated by open reflector strip linear fluorescent fixtures with a wire guard (for lamp protection). The fixtures will be provided with a Super T8 lamp/ballast combination or T5 lamps.

- The lighting for the parking garage will be weatherproof linear fluorescent fixtures. The lamping will be either Super T8 combination or T5.

- The majority of hotel lighting for interior common areas will be provided by fluorescent fixtures.

- Common area lighting will be provided with dimmer systems where appropriate.

- Exit signs will be LED powered.

- Energy efficient exterior lighting, including metal halide or sodium vapor lights, is proposed for lighting at the *porte cochere* and general exterior architectural lighting.

- The majority of downlights and wallwashers in the office building lobbies and cores will be fluorescent.

- A central control system is being considered for controlling the operation of building lighting in the office base building.

Third Party Building Commissioning

Commissioning is a "planned, systematic quality-control process" which confirms that the building systems are installed and perform as they were designed. Fundamental commissioning, in regard to LEED, must cover, at a minimum, the following building systems:

- Heating, ventilating, air conditioning, and refrigeration systems and associated controls;

- Lighting and daylighting controls;
- Domestic hot water systems; and
- Any renewable energy systems.

For fundamental commissioning, the commissioning agent for a project greater than 50,000 sf must be independent of the project's design and construction management teams (though they may be employed by those firms). The Proponent is committed to fundamental commissioning and will use an independent firm for fundamental commissioning of the Project.

The Proponent has evaluated enhanced commissioning, which is an option under LEED that allows a proponent to put a project under further scrutiny. Under enhanced commissioning, the commissioning agent must:

- Be independent of the project's design and construction management teams (not be employed by those firms).
- Be hired prior to the start of the construction documents phase and lead, review and oversee the completion of all commissioning process activities.
- Review applicable contractor submittals to ensure compliance with the design documents.
- Develop a systems manual to educate operations staff about the commissioned systems and their optimal operation.
- Verify that requirements for training operations staff and building occupants have been completed.
- Perform a review of building operations within 10 months after substantial completion of the project.

Enhanced commissioning may add systems to the commissioning process, including the building envelope, stormwater management systems, water treatment systems, information technology systems, and elevators.

The Proponent has solicited and reviewed proposals for enhanced commissioning from several firms and concluded that the cost is prohibitive. The Proponent is committed to fundamental commissioning, which will be performed by an

independent third party. The Proponent believes that the funds required for enhanced commissioning would be better spent on additional energy efficiency measures for the Project.

Building Energy Management Systems

The Proponent is currently evaluating options for building energy management systems, especially for the office component which will have limited hours of operation and therefore will benefit most by such a system. The hotel will most likely manage energy use room-by-room, rather than building wide. In addition, the hotel rooms will have operable windows, allowing for natural cooling and heating. Until further information on a building energy management system can be produced, it is unclear what the GHG impact will be. However, it is anticipated that GHG emissions will be decreased by the use of a building energy management system for the office. The Proponent will provide details on its findings if requested by MassDEP.

Duct Insulation

During construction of the Project, ducts will be sealed with mastic, tested and then insulated.

Roof and Wall Insulation

The Proponent anticipates that the roof and wall insulation will assist in lowering the Project's overall energy consumption by at least 14 percent compared to the ASHRAE 90.1-2004 standard, as required for LEED certification. The GHG emissions analysis provided in the ENF used the LEED standard for the building. As the design of the Project progresses, increasing the R-value of the proposed insulation will be reconsidered. Increasing insulation is a relatively inexpensive way to reducing energy use, so it is likely to be a key element in the Proponent's approach to exceeding the ASHRAE standard. In addition, the Proponent recognizes the benefits of a low window to wall ratio, and will continue to evaluate the exterior facades relative to energy efficiency, daylighting, and architectural and urban design considerations as the design progresses.

Renewable On-site Generation

Due to the limited space available below grade because of the I-93 northbound and ramp tunnels, a geothermal heating/cooling system was deemed infeasible.

The Proponent has investigated the possibility of the installation of a solar photovoltaic (PV) system and/or a combined heat and power (CHP) cogeneration system. A critical barrier to a PV or a CHP system is that the Project is located on NSTAR's spot network. NSTAR may approve an inverter based distributed generation (DG) system up to a maximum of 15 kW. To get approval for the interconnection with the utility would be a lengthy and expensive process with an uncertain outcome, and, since only a maximum of 15 kW, or approximately 0.25% of the Project's total anticipated electrical load (6,000 kW), may be sent back into the NSTAR grid, the interconnection would not be economically feasible.[3] (See attached email correspondence with NSTAR.)

The Proponent has also considered a non grid-connected PV or CHP system. Based on preliminary analysis, it is not feasible or cost-effective to install an off-grid power generation system. The main benefit of installing a grid-connected distributed generation system is the assurance of receiving power from the utility when the site generated power system is not running. This is essential for the PV system, which produces intermittent power, and for the CHP system which needs to be shut down for periodic maintenance. In a non grid-connected power generation system, the site generated power system would need to feed a dedicated distribution panel and be provided with a transfer switch to transfer to the utility power supply upon system failure or scheduled shut down. The site generated power system would need to be sized to provide power for the maximum simultaneous demand of the dedicated distribution panel. This results in a power generation system sized to meet the maximum simultaneous demand of the office building and hotel, but because that simultaneous maximum demand rarely occurs, a system of the necessary size would operate inefficiently most of the time. The other issue with a non grid-connected power generation system is the necessity of providing banks of batteries for storage of excess power from the

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[3] Because spot and area network systems allow power to flow through multiple paths, adding a distributed generation generator to these systems introduces the risk of back feeding power into the NSTAR grid when the grid is not delivering power to the site due to maintenance or system failures. This presents significant risks to the safety of utility workers, the performance of the distribution system equipment, and the power quality of other customers on the same network. Because of these risks, the utilities must evaluate proposed distributed generation on these spot and area network systems more exhaustively than they do for radial system interconnections (where a radial customer is served by a single utility line connected to one transformer that then connects to the building).

site generated power system when the electrical demand of the distribution panel is below the maximum capacity of the power generated system.

The PV system would also require space on the roof. Neither the office building nor the hotel will have a basement because of the I-93 Northbound lanes and ramp tunnels, so mechanical equipment must be located on the roof, leaving little space for a PV system. After evaluation of these issues, it was deemed not economically feasible to install an off-grid site generated power system (either PV or CHP) for this Project.

The solar thermal system would be most efficient if placed on the roof of the hotel, since the hotel, with 24/7 use and high demand for domestic hot water, would be more suitable than the office component for using such a system. However, as mentioned, the Project will not have a basement, and therefore mechanical equipment will be placed on the rooftop, leaving little space for solar panels. The roof of the hotel already has a penthouse, stairs, ductwork (some of which must be located on the roof because of the limited floor to floor height in the hotel), walkways and equipment scattered across the roof surface (see attached hotel roof plan). These obstructions, and their shadows, would prevent effective placement of the solar panels. Moreover, to maximize the annual power production capacity of a solar thermal system, the solar panels should be south facing at a 33 degree angle to the ground. Since the hotel is located at the northern part of the building, south facing solar panels installed on top of this roof would be shaded by the electrical and mechanical penthouses and equipment located on the office roof (see attached office roof plan). The only portion of roof space which may be available for effective placement of the solar panels would be at the southernmost part of the office side, approximately 300 to 500 feet away from the point of use on the hotel side, which would not allow for an efficient and economically feasible solar thermal system.

The City of Boston Zoning Code (the Zoning Code) is inconclusive in regard to how solar photovoltaic systems and solar thermal systems on rooftops relate to building dimensions, especially building height and percentage of rooftop coverage. The Zoning Code allows for one-third of the rooftop to be covered with mechanical and other equipment. However, if equipment covers more than one third of the roof area, as seems likely for PV and solar panels, the zoning height of the building would be increased by one floor. This would require a greater height variance than currently anticipated from the City of Boston Board of Appeal, which closely scrutinizes such height variance requests. Such equipment would also potentially increase the visual impacts of the structure on two adjacent National Register historic districts. Such impacts are subject to review by the

Massachusetts Historical Commission, which has expressed concern about building height and visual impacts for other projects in the Bulfinch Triangle.

The Proponent has also investigated obtaining district steam from Trigen for use in building heating and domestic hot water systems. There are several issues with this concept as outlined below.

- Since Trigen will not allow steam condensate to be returned to its plant, the steam condensate would have to be cooled and discharged into the sanitary system, increasing the burden on the sanitary system and treatment plant. This additional release of steam condensate would add to the Project's wastewater flow and, as MassDEP indicates in its comment letter, increase energy consumption, and therefore GHG emissions. In addition, there is a potential waste of energy if the heat extracted from this steam condensate cannot effectively be used, especially in the summer months.

- Discharging the steam condensate into the sanitary system instead of returning it to the heating plant would require more use of potable water at the heating plant, but associated with the Project.

- The efficiency of the Trigen heating plant (equipment and piping distribution) is not known. The Trigen steam system may not be as efficient as the building's heating and domestic hot water equipment, which is proposed to have 96% thermal efficiency for heating and 95% thermal efficiency for domestic hot water, serving the office side.

After consideration of the above issues, the Proponent is leaning toward providing the Project its own heating and domestic hot water systems.

Water Conservation

The Project will use low-flow fixtures to reduce the demand for water by 30% as compared to Energy Policy Act of 1992 compliant fixtures. The Proponent anticipates this will reduce baseline consumption by 2,373,707 gallons per year. The fixtures that are proposed include dual-flush toilets, 0.5 gallon per flush (gpf) lavatories with 12 second sensors, 0.5 gpf urinals, and 2.0 gallons per minute showers. This reduction of water use and wastewater generation, using the formula included in MassDEP's comment letter, would save approximately 3,561 kWh and 4,558 pounds of CO_2 (assuming 1.28 pounds of CO_2 per kWh for electric power).

Rainwater Harvesting

Rainwater harvesting was deemed infeasible for the Project because of the limited space available below grade for a large storage tank due to the location of the I-93 Northbound and ramp tunnels, and because of the limited landscape irrigation demand for such water. The street trees surrounding the Project are irrigated by the city and are not in the Project's scope, leaving only the corner plaza plantings potentially needing irrigation. Rainwater harvesting for use within the building, such as for toilet flushing in the hotels, was considered but deemed to be cost prohibitive due to the additional pumps, filters, a separate riser for the toilet supply water separate from the building cold water supply for sinks and showers, and controls required.

Heat Island Effect

To reduce the heat island effect, the Project will, at minimum, use a high albedo roof. However, a green roof is still being considered and would result in a similar reduction in heat capture.

Solid Waste

Greenhouse Gas Impacts of Project Materials

In response to MassDEP's letter, the Proponent has researched the calculators suggested by MassDEP. However, due to the level of design of the Project, specific materials have yet to be chosen. Therefore, determining the GHG impact from materials management is not possible at this time. Below is a discussion of the Proponent's strategy in regard to materials management. If requested, the Proponent will provide MassDEP information on the GHG impacts of materials management when that information becomes available.

Solid Waste Planning During Design

The Proponent has considered materials management during the design process, which is ongoing, including the development of a waste prevention purchasing policy. The Proponent has committed to using at least 10% recycled content, and is working toward limiting waste as much as practicable. As design proceeds, the Proponent anticipates that additional waste prevention measures can be incorporated into the Project.

Solid Waste Generation During Construction

The Proponent will take an active role with regard to the reprocessing and recycling of construction waste, and anticipates the reuse or recycling of more than 50% of construction waste. Before construction, the Proponent will develop a construction waste management plan that complies with the MassDEP Waste Bans. Solid waste generated during construction will consist primarily of packaging and scrap materials (such as corrugated cardboard, glass, aluminum, scrap metal, cable and wire) associated with new construction. Recyclable construction waste will be handled by waste disposal companies.

Construction will be conducted so that materials that may be recycled are segregated from materials that are not recyclable to enable their disposal at an approved solid waste facility. Materials that cannot be recycled will be transported in covered trucks to an approved solid waste facility, per MassDEP's Regulations for Solid Waste Facilities, 310 CMR 16.00. This requirement will be specified in the disposal contract. A comprehensive recycling program will be included in the final Construction Management Plan.

Operation Solid Waste Generation

The Project will generate solid waste typical of other mixed-use projects. Solid waste generated by the Project will be approximately 603.1 tons per year, based on the amount of retail space proposed at a generation rate of 5.5 tons per 1,000 square feet per year, the amount of office space proposed at a generation rate of 1.3 tons per 1,000 square feet per year, and the number of hotel rooms proposed at a generation rate of four pounds per room per day as shown in Table 1. The Project will include an approximately 300 square foot room for the storage of trash and recycling for the office component, a 200 square foot room for the storage of trash and recycling for the hotel component, and a dedicated bay with a dumpster in the loading dock. The hotel component will include notices in guestrooms instructing guests of recycling procedures. Additional details on how the hotel component will store and process trash and recyclable materials are still being developed.

Table 1 Solid Waste Generation

Proposed Use	Program	Generation Rate	Solid Waste (tons per year)
Office	206,000 sf	1.3 tons/ 1,000 sf/year	267.8
Retail/Restaurant	23,000 sf	5.5 tons/ 1,000 sf/year	126.5
Hotel	286 rooms	4 pounds/ room/day	208.8
Total Solid Waste Generation			603.1

Solid waste will likely include wastepaper, cardboard, glass, bottles, and food waste. A portion of the waste will be recycled as described below. The remainder of the waste will be compacted and removed by a waste hauler contracted by building management. With the exception of "household hazardous wastes" typical of office, hotel and retail uses (for example, cleaning fluids and fluorescent lamps), the Project uses will not generate hazardous waste. Fluorescent lamps will be disposed of properly to avoid having them end up in a landfill.

Trash will be picked up from the internal loading docks (two for the hotels and restaurants and two for the office space) four times per week. Restaurant trash will be stored at the northern loading dock for collection.

Recycling

The Proponent will implement a recycling program that emphasizes continuous improvement in minimizing the ecological footprint on the environment. The Proponent will assist contractors and tenants in meeting MassDEP Waste Ban mandates through waste reduction, procurement of recycled-content and "environmentally preferable" products where feasible, and establishing relationships with vendors who responsibly dispose of materials. The Proponent will facilitate and encourage recycling, and provide the necessary space for tenants to recycle. The Proponent will coordinate with the City of Boston to implement a strategy that complements the City's Recycling Strategic Plan. Recycling by retail, office and hotel tenants will be encouraged and coordinated. The Proponent will implement a recycling program throughout the Project. The Project will include space for recycling in the building, and the loading and receiving areas will include space for the storage and pick-up of recyclable materials. Recycling efforts

will include the recapture of mixed office paper, newspaper, cardboard, magazines, plastics numbered 1 through 7, glass, aluminum and other scrap metal, abandoned copper wiring, office furniture, computer and electronic equipment, batteries, light bulbs, paint, cell phones, toner and printer cartridges, and additional materials as appropriate. The Proponent will also seek to maximize waste prevention through the maintenance and cleaning practices of the site, such as the purchase of eco-friendly products and the use of refillable containers.

Construction Period Air Quality

The Proponent will participate in the MassDEP Diesel Retrofit Program.

Please do not hesitate to contact me at (978) 461-6226 if you would like to discuss these matters.

Sincerely,

EPSILON ASSOCIATES, INC.

Laura E. Rome
Associate

cc: John D. Viola, Department of Environmental Protection, NERO
Meg Lusardi, Department of Energy Resources
Brona Simon, Massachusetts Historical Commission
Marianne Connolly, Massachusetts Water Resources Authority
John P. Sullivan, Boston Water and Sewer Commission
Boston Environment Department
Richard Bertman, Downtown North Association
Wendy Landman, Robert Sloane, WalkBoston
Robert B. O'Brien, Bulfinch Triangle Community Advisory Committee

From: Feraci, Joseph [mailto:Joseph.Feraci@nstar.com]
Sent: Friday, October 24, 2008 2:52 PM
To: William Sierra
Cc: Feraci, Joseph
Subject: Beverly Street, Boston Network Check Request

William,

NSTAR Engineering has determined that the location you inquired about is on an NSTAR spot Network. That means that NSTAR may approve an inverter based DG system up to a maximum of 15 kW. If you wish to proceed with the application process, please send the signed and completed expedited/standard application, associated documents and the $300 application fee to me at the address below. NSTAR engineering will then do a closer evaluation of the project before giving final authorization. If you have any questions please contact me.

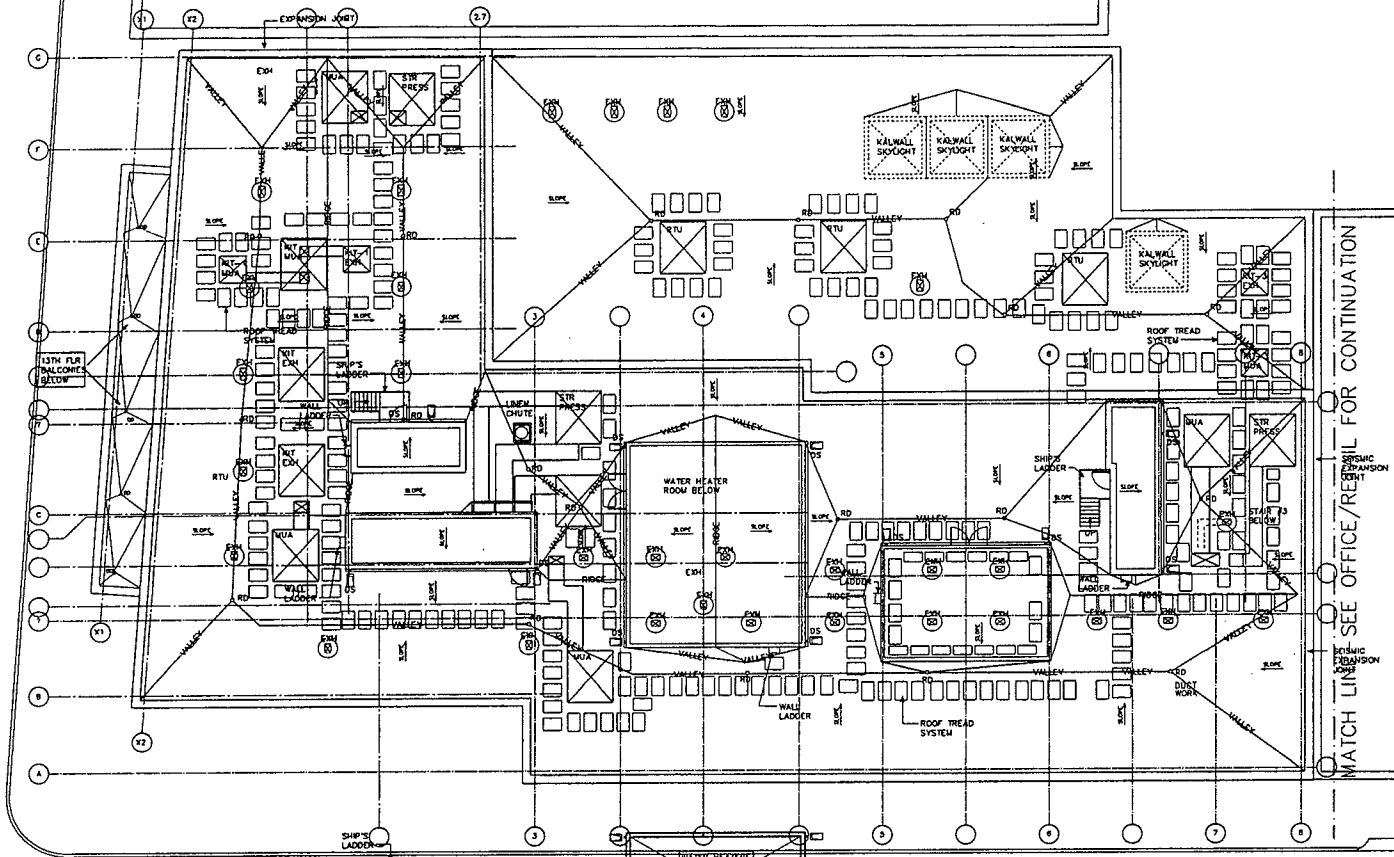
Thank You,

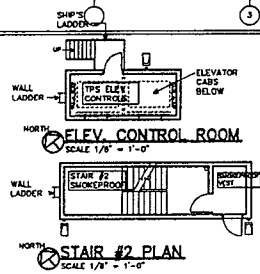
Joe Feraci
NSTAR Electric
One NSTAR Way
Mailstop SUMSW360
Westwood, MA 02090
Phone: 781-441-8196
Fax: 781-441-8721
E-Mail: joseph.feraci@nstar.com

PROVIDE/INSTALL A UL APPROVED LIGHTNING PROTECTION SYSTEM FOR THE HOTEL.

ALL ROOF AREAS SHALL BE SINGLE PLY ROOF OVER TAPERED INSULATION

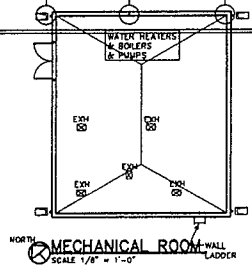
HIGH AND LOW ROOFS SHALL HAVE A SOLAR REFLECTANCE INDEX EQUAL TO OR GREATER THAN 78. SRI IS CALCULATED ACCORDING TO ASTM E 1980.



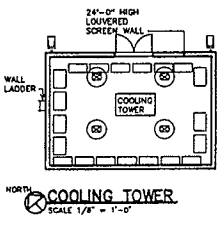


ELEV. CONTROL ROOM
SCALE 1/8" = 1'-0"

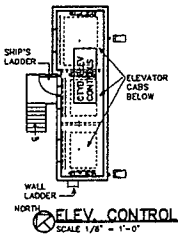
STAIR #2 PLAN
SCALE 1/8" = 1'-0"



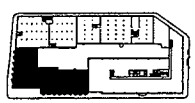
MECHANICAL ROOM
SCALE 1/8" = 1'-0"



COOLING TOWER
SCALE 1/8" = 1'-0"



ELEV. CONTROL RM
SCALE 1/8" = 1'-0"



KEY PLAN

ROOF PLAN
SCALE 1/8" = 1'-0"

NOT FOR CONSTRUCTION

SCHEMATIC DESIGN

BOSTON – MERANO
BOSTON, MASSACHUSETTS

ROOF PLAN

HA-115

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Deval L. Patrick
GOVERNOR

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LIEUTENANT GOVERNOR

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November 21, 2008

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: The Center at Lenox Retail Expansion Project
PROJECT MUNICIPALITY	: Lenox
PROJECT WATERSHED	: Housatonic
EEA NUMBER	: 14332
PROJECT PROPONENT	: MEC Lenox Associates, LP. c/o S.R. Weiner and Associates, Inc.
DATE NOTICED IN MONITOR	: October 22, 2008

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62I) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of an Environmental Impact Report (EIR).

Project Description

The proposed project consists of expansion of an existing retail development on a 36-acre site abutting Routes 7 and 20 in the Town of Lenox. The existing development, totaling 106,139 square feet, includes a restaurant, bank, and two retail buildings, which will remain. The site also includes parking and utilities for the existing development and a fire protection pond. The proposed project involves construction of a 13,225 square foot (sf) retail pharmacy and a 73,700 sf bank and retail building with associated utilities, driveways and parking areas. The project includes expansion of the fire pond and demolition of an existing 956-sf structure.

The project site includes a wooded wetland system, located to the north of the proposed retail expansion, and areas mapped as priority habitat for two state-listed plant species. According to the Environmental Notification (ENF), the proposed project will result in an additional 6.6 acres of land alteration, including 4.4 acres of new impervious area and alteration

of 4,500 sf of Bordering Vegetated Wetlands (BVW). The proposed project will result in 3,602 new vehicle trips per day for a total of 10,656 trips on an average weekday and 4,714 on an average Saturday for a total of 14,300 vehicle trips on an average Saturday, when combined with the existing development. Ninety-five new parking spaces are proposed, for a total of 768 spaces. Water demand for the project is estimated at 5,069 gallons per day (gpd) and wastewater generation is estimated at 4,608 gpd (a combined total of 13,642 gpd and 12,402 gpd respectively, including the existing development). The project will be served by municipal water and sewer system. The ENF indicates that the existing pond, currently used for fire suppression, may be expanded to provide increased volume needed for the proposed retail expansion.

MEPA Jurisdiction and Permitting

The project is undergoing environmental review because it requires a state agency action and exceeds a MEPA review threshold. The project is subject to a mandatory EIR pursuant to 301 CMR 11.03(6)(a)(6) because it will result in generation of 3,000 or more new vehicle trips per day. The project is also under review pursuant to 301 CMR 11.03(2)(b)(2) because it may involve a "take" of a state-listed species.

The project requires a Vehicular Access Permit for access to Route 7/20 from the Massachusetts Highway Department (MassHighway). The project requires an Order of Conditions from the Lenox Conservation Commission (and, on appeal only, a Superseding Order from the Massachusetts Department of Environmental Protection (MassDEP)). The project may require a Conservation and Management Permit from the Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program (NHESP). The project is subject to the requirements of the MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol because it requires an EIR and a Vehicular Access Permit from MassHighway.

The proponent is not seeking financial assistance from the Commonwealth. Therefore, MEPA jurisdiction is limited to those aspects of the project that are within the subject matter of any required or potentially required state permits and that may cause Damage to the Environment as defined in the MEPA regulations. In this case, MEPA jurisdiction extends to transportation, greenhouse gas emissions, wetlands, rare species, and stormwater.

SCOPE

General

The proponent should prepare a Draft EIR (DEIR) in accordance with the general guidance for outline and content found in Section 11.07 of the MEPA regulations as modified by this Scope. The DEIR should include maps and plans at a reasonable scale, a project summary and schedule, and a description of any changes since the filing of the ENF.

The DEIR should include existing and proposed conditions plans. Site plans should clearly show all proposed project elements including the fire pond expansion, detention ponds and other components of the stormwater management system. Site plans for the proposed project

and its alternatives should delineate wetland resource areas and buffer zone, and mapped state-listed species habitat to facilitate review and evaluation of potential impacts.

Alternatives

The DEIR should include an evaluation of all feasible alternatives and describe how the preferred alternative will avoid, minimize and mitigate environmental impacts to the maximum extent feasible. The alternatives analysis should include a clear comparison (quantified to the extent feasible) of the impacts of each alternative and its project components (including but not limited to acres of land alteration, impervious area, wetlands, habitat impacts, traffic and parking, and greenhouse gas emissions). The DEIR should provide a rationale to explain why certain alternatives are selected and others ruled out for further consideration.

The DEIR should consider alternative site layouts and building configurations, and include an analysis of alternatives to avoid and minimize impacts to wetlands resource area and state-listed species habitat, as well as alternatives to reduce greenhouse gas emissions as further detailed in the Scope below.

The ENF proposes 768 parking spaces, which includes an additional 95 new spaces. However, the ENF indicates that town bylaws require 665 spaces. To reduce land alteration and impervious area, the DEIR should evaluate an alternative layout with the minimum parking required by the Town of Lenox. The proponent should consider a reserve parking area if needed in the future and provide a detailed explanation to justify the need for any additional spaces proposed.

Permitting and Consistency with State, Local and Regional Policies

The DEIR should discuss applicable permits and regulatory requirements, and describe how the project will meet relevant performance standards. The DEIR should include a list of required permits and approvals and provide an update on the status of each permit and/or approval.

The DEIR should address the issues raised in the comment letter from the Berkshire Regional Planning Commission (BRPC), which indicates that the proposed project is consistent with certain components of local and regional plans but not others, namely pedestrian connections with adjacent developments, aspects of transportation management, and wetlands and stormwater management.

The DEIR should describe the project's consistency with Executive Order No. 385, Planning for Growth and the Commonwealth's Ten Sustainable Development Principles. The DEIR should also demonstrate consistency with the MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol in accordance with the GHG section of the Scope below.

Rare Species

The proposed project has the potential to adversely impact state-listed plant species. Portions of the project site are mapped as Priority Habitat for the Crooked Stem Aster (*Symphyotrichum prenanthoides*), the Hill's Pondweed (*Potamogeton hillii*) and the Intermediate Spike Sedge (*Eleocharis intermedia*). The proponent will be required to submit a formal Massachusetts Endangered Species Act (MESA) filing to NHESP pursuant to 321 CMR 10.00. The DEIR should include an update on the results of botanical assessments and field surveys conducted to evaluate potential impacts to state-listed plant species. The proponent should consult with NHESP regarding survey protocols and results. All field survey protocols will require approval from NHESP. The DEIR should evaluate alternatives with less impacts to state-listed plant species, and discuss how the preferred alternative will avoid and minimize, or mitigate impacts to the maximum extent practicable. The DEIR should describe how the project will avoid a "take", or if a take cannot be avoided, the DEIR should describe how the project will be designed to meet the performance standards for a Conservation and Management Permit pursuant to MESA.

As further detailed in the NHESP comment letter, the landscape surrounding the project site is habitat for a variety of native state-listed plants. The DEIR should describe the proposed landscape and erosion control plan and measures to avoid problems relating to invasive species as recommended by NHESP.

Wetlands and Stormwater Management

The ENF proposes alteration of 4,500 square feet of bordering vegetated wetlands (BVW) but does not evaluate alternatives or mitigation measures. The DEIR should include an analysis of alternatives to avoid and minimize impacts to BVW, as well as commitments to mitigation for any unavoidable impacts. The DEIR should demonstrate consistency with the general performance standards for BVW pursuant to the Wetlands Protection Act (WPA). The DEIR should quantify impacts to wetland resource areas and buffer zones, and clearly indicate impact locations on site plans, as well as proposed replication areas.

The DEIR should clarify whether or not the pond on site is a jurisdictional pond under the WPA and discuss how the proposed stormwater management plan is consistent with applicable performance standards. The DEIR should include a drainage analysis comparing existing and proposed conditions, and describe how the proposed project will comply with the General Performance Standards for all jurisdictional resource areas and the MassDEP's Stormwater Management Regulations (effective January 2, 2008). MassDEP's stormwater management standards were revised and incorporated into the Wetlands Protection Act Regulations (310 CMR 10.00) and the 401 Water Quality Certification Regulations (314 CMR 9.00). As noted in the comment letter from MassDEP, Western Regional Office, the project does not qualify as a *stormwater redevelopment project and must fully comply with the ten stormwater standards.*

The DEIR should evaluate low impact development (LID) techniques for the project and demonstrate the proponent's commitment to apply LID to the extent feasible. Pursuant to the stormwater regulations, the proponent is required to consider environmentally sensitive design

that incorporates LID techniques in addition to stormwater best management practices (BMPs). The DEIR should include a detailed stormwater management plan, with a description and location of proposed BMPs.

The DEIR should evaluate the feasibility of groundwater infiltration at the project site with respect to the shallow groundwater table. The DEIR should discuss compliance with MassDEP's proposed revisions to 314 CMR 5.00 *Groundwater Discharge Permitting Program Regulations*. The proposed regulation requires a General Permit for stormwater discharge into the ground from parking lots with high intensity use (more than 1,000 trips per day). Depending on the timeframe for permitting and construction, the project may be subject to either the proposed regulations or to the existing Underground Injection Control (UIC) Program registration requirement.

Transportation

The Executive Office of Transportation and Public Works (EOT) indicates in its comment letter that the traffic study provided in the ENF generally conforms to the EEA/EOT Guidelines for EIR/EIS Traffic Impact Assessments. The proponent committed to funding and implementing optimization of the signal timing for the intersection of Routes 7 and 20/main site drive/Holmeswood Terrace, and updating the traffic signal coordination to improve flow on the Route 7/20 corridor. EOT indicates that the traffic associated with the project can be accommodated by the existing infrastructure and proposed improvements. However, additional information and analysis should be provided in the DEIR as outlined below and in the EOT comment letter.

I note the detailed comments from the Berkshire Regional Planning Commission (BRPC) with questions and comments pertaining to the trip generation calculations and the level of service analysis. The DEIR should respond to BRPC comments and include revised calculations as necessary to clarify any changes in the traffic analysis or mitigation plan since the filing of the ENF.

The DEIR should evaluate the feasibility of including a sidewalk on the south side of the main site drive as recommended by EOT and BRPC. The DEIR should re-evaluate the proposed left-turn phase from Route 7/20 onto Holmes Road because MassHighway is planning to install additional signal heads at this intersection to reduce crash frequency. The DEIR should include an update on consultations with EOT/MassHighway on this issue as well as the proposed "red signal ahead" sign on the southbound approach of the Route 7/20/Dan Fox Drive intersection.

The DEIR should include a revised mitigation plan describing the proponent's commitments to traffic monitoring and a Transportation Demand Management (TDM) Program. EOT has recommended that the proponent commit to performing traffic counts two years after completion of the project at five intersections, which include the intersection of Route 7/20 with Dan Fox Drive, Secondary Site Drive, Main Site Drive, Holmes Road, and New Lenox Road.

The DEIR should describe in detail the proposed TDM measures. In developing a TDM program, the proponent should encourage and facilitate pedestrian access to the existing

Berkshire Regional Transit Authority (BRTA) bus route on Routes 7/20, and encourage use of carpools and/or vanpool access to the site. The DEIR should discuss how the site design will accommodate bus turn movements as proposed. I refer the proponent to the EOT and BRPC comment letters for suggestions on other TDM measures to consider including employee incentives, bicycle racks, bus turn-outs and shelters, posted schedule information, and other on-site services. The DEIR should discuss the results of the proponent's consultations with BRTA and MassRides statewide travel options program regarding the TDM program.

The DEIR should include a letter of commitment to mitigation that is sufficient to serve as the basis for MassHighway to issue a Section 61 Finding for the project.

Greenhouse Gas Emissions

A project at this early stage of development provides a multitude of opportunities for designing buildings and transportation management measures that reduce energy consumption and substitute fossil fuel with renewable energy sources. As further detailed in the comment letter from MassDEP and the Department of Energy Resources (DOER), recent studies have demonstrated the growing market demand for green buildings and the performance efficiencies associated with Leadership in Energy and Environmental Design (LEED)-rated buildings. I refer the proponent to the MassDEP/DOER comment letter for additional information and references to relevant studies. The DEIR should include an analysis of Greenhouse Gas (GHG) emissions and mitigation measures in accordance with the requirements of the MEPA GHG Policy and Protocol and as further detailed below.

The DEIR should quantify direct and indirect GHG emissions associated with the project's energy use and transportation-related emissions. Direct emissions include on-site stationary sources, which typically emit GHGs by burning fossil fuel for heat, hot water, steam and other processes. Indirect emissions result from the consumption of energy, such as electricity, that is generated off-site by burning of fossil fuels, and from emissions associated with vehicle use by employees, vendors, customers and others. The DEIR should outline and commit to mitigation measures to reduce GHG emissions. I refer the proponent to the GHG Emissions Policy and Protocol for additional guidance on the analysis. In addition, the appendix to the GHG policy and the comment letter from MassDEP and DOER include suggestions for GHG mitigation measures. I encourage the proponent to consult with the MEPA Office early in the design process regarding the scope and methodology of the analysis.

The proponent should establish a project baseline condition that includes energy use and transportation-related Carbon dioxide (CO_2) emissions associated with the existing development at the project site as well as emissions associated with code-compliant new buildings. The baseline condition should also include transportation-related emissions for the proposed retail expansion, modeled on the build without mitigation condition. The baseline code compliant quantification of CO_2-related emissions must reflect the recent amendment to the Massachusetts State Building Code that incorporates the performance standards of the International Energy Conservation Code (IECC) as further detailed in the MassDEP/DOER comment letter.

The DEIR should include a GHG emissions analysis that compares 1) a code-compliant baseline condition; 2) the preferred alternative, with mitigation; and 3) project alternatives with greater GHG emissions-related mitigation. The DEIR should indicate which energy modeling tool was used and present the data used to model the energy use in buildings. The DEIR should identify TDM measures proposed for each of the alternatives and the corresponding emission reductions expected.

The alternatives analysis helps identify opportunities for energy savings achievable by varying building design and layout strategies. If the proponent chooses not to select certain energy efficient techniques that would provide a greater reduction in emissions compared with the preferred alternative, the DEIR should explain why certain alternatives were rejected. The alternatives analysis should clearly demonstrate consistency with the objectives of MEPA review, one of which is to document the means by which the proponent plans to avoid, minimize, or mitigate damage to the environment to the maximum extent feasible. The proponent should fully explain any trade-offs inherent in the GHG analysis, such as increased impacts on some resources to avoid impacts on others.

The proponent should consider upgrading the existing buildings to improve energy efficiency as part of its GHG mitigation commitments. I encourage the proponent to conduct a comprehensive energy audit of the existing buildings on site and include the results of the audit, including any proposed energy efficiency improvements, in the DEIR. I also encourage the proponent to commit to the Massachusetts Leadership in Energy and Environmental Design (LEED) Plus standard, Energy Star elements, and purchase of power from renewable sources.

The DEIR should describe the proponent's strategy for monitoring energy performance of buildings to ensure the energy systems function as designed over the long-term. As noted by DOER, a system for monitoring energy performance would be expected to pay for itself by eliminating potential inefficient energy operations.

The DEIR should evaluate the feasibility of incorporating solar (photovoltaic) power on site to generate energy for some of the building's functions. DOER has recommended that a life-cycle analysis be included in the DEIR, that considers the subsidies available through the Commonwealth Solar and Renewable Portfolio Standard (RPS) Program and federal tax credits. DOER recommends that the life-cycle analysis evaluates the installation of a PV system during project construction under two scenarios: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party that will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. If PV is considered economically infeasible at this time, DOER recommends that the proponent consider committing to PV installation at a future date or hosting a third-party-owned PV array under a favorable power purchase agreement.

The DEIR should include additional information and analysis in response to the DOER and MassDEP comments on: building orientation; energy-efficient lighting; interior day-lighting; duct insulation; roof and wall insulation; windows; high efficiency heating ventilation and air conditioning (HVAC) systems; high-albedo roofing materials; third party building

commissioning; lighting motion sensors, and climate control and building energy management systems.

Materials Management

The DEIR should respond to MassDEP comments regarding materials management including plans for waste reduction, environmentally preferable materials use, and storage and collection of recyclables and hazardous materials. MassDEP has requested that the proponent quantify the GHG impacts of materials management for the project development and future operation, which will assist in identifying and targeting GHG mitigation efforts. I refer the proponent to the MassDEP/DOER comment letter for guidance on this analysis.

MassDEP has requested that the proponent commit to developing a construction waste management plan (CWMP) that fully complies with the Massachusetts waste bans and establishes a minimum reuse/recycling goal of 50 per cent. MassDEP also recommends a waste management plan for the operations phase of the project. I refer the proponent to the MassDEP/DOER comment letter for additional guidance.

Mitigation and Section 61 Findings

The DEIR should include a separate chapter on mitigation measures, which should include proposed Section 61 Findings for all state permits required and a summary table of all mitigation proposed. The mitigation chapter of the DEIR should describe proposed mitigation measures, contain clear commitments to mitigation and a schedule for implementation, and identify parties responsible for funding and implementing the mitigation measures.

Response to Comments

In order to ensure that the issues raised by commenters are addressed, the DEIR should include a response to comments to the extent they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of the DEIR beyond what has been expressly identified in this certificate. The DEIR should include a copy of this Certificate and a copy of each comment letter received on the ENF.

Circulation

The DEIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should be sent to the list of "comments received" below. A copy of the DEIR should be made available for public review at the Town of Lenox and the City of Pittsfield Public Libraries.

November 21, 2008

Ian A. Bowles, Secretary

Comments Received

11/10/08	Division of Fisheries and Wildlife, Natural Heritage and Endangered Species Program
11/11/08	Berkshire Environmental Action Team
11/11/08	Berkshire Regional Planning Commission
11/12/08	Department of Environmental Protection, Western Regional Office
11/12/08	Department of Environmental Protection, Boston Office and Department of Energy Resources (joint comment letter on Greenhouse Gas Emissions Analysis)
11/14/08	Executive Office of Transportation & Public Works

IAB/AE/ae

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WESTERN REGIONAL OFFICE
436 Dwight Street • Springfield, Massachusetts 01103 • (413) 784-1100

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

Date: November 11, 2008

Ian Bowles, Secretary
Executive Office of Energy & Environmental Affairs
Massachusetts Environmental Policy Act Office
Aisling Eglington, EEA No. 14332
100 Cambridge Street 9th Floor
Boston, MA 02114-2524

Re: The Center at Lenox
Lenox, MA

Dear Secretary Bowles,

The Massachusetts Department of Environmental Protection (MassDEP), Western Regional Office (WERO) appreciates the opportunity to comment on the Environmental Notification Form (ENF) submitted for the proposed The Center at Lenox (EEA #14332) in Lenox. Applicable MassDEP regulatory and permitting considerations regarding wetlands, wastewater, drinking water, air pollution, asbestos, solid and hazardous waste, and waste site cleanup are discussed. MassDEP staff attended the MEPA site visit on November 4, 2008.

I. Project Description

The project involves construction of 13,225 square foot (sf) retail pharmacy and a 73,700 sf bank and retail building with associated utilities, driveways and parking areas. The project includes demolition of an existing 956-sf structure. The 36-acre project site includes an existing restaurant, bank, and other retail buildings. The proposed project will result in an additional 6.6 acres of land alteration, including 4.4 acres of new impervious area and alteration of 4,500 sf of Bordering Vegetated Wetlands (BVW). The proposed development will result in 3,602 new vehicle trips per day for a total of 10,656 trips on an average weekday. Ninety-five new parking spaces are proposed (for a total of 768 spaces). Additional water use is estimated at 5,069 gallons per day (gpd) (for a total of 13,642 gpd) and wastewater at 4,608 gpd (for a total of 12,402 gpd). The ENF proposes a connection for wastewater disposal to the municipal sewer system and indicates that the proponent is evaluating expansion of the existing fire pond to service the domestic water needs of the proposed retail center development.

II. Required Mass DEP Permits and/or Applicable Regulations

Wetlands
310 CMR 10.00
Wastewater
314 CMR 7.00
Drinking Water
310 CMR 27.00
Air Pollution
310 CMR 7.00
Solid Waste
310 CMR 16.00
310 CMR 19.000
Hazardous Waste
310 CMR 30.0000
Bureau of Waste Site Cleanup
310 CMR 40.0000

III. Permit Discussion

Bureau of Resource Protection

Wetlands
The project can progress through the local permitting process that requires submittal of a Notice of Intent to the Lenox Conservation Commission. The Site appears to contain Bank (Inland) and Bordering Vegetated Wetland. The proponent must demonstrate compliance with the General Performance Standards for all jurisdictional Resource Areas and the MassDEP's *Stormwater Management Regulations* (effective January 2, 2008).

The applicant has submitted an Abbreviated Notice of Resource Area Delineation (ANRAD) to delineate resource areas at the site and MassDEP has submitted extensive comments to the Commission. The most significant issue is to determine whether or not the pond on site is in fact a jurisdictional pond under the Wetlands Protection Act. If the pond is determined to be jurisdictional, this may impact the applicant's proposed Stormwater Management Plan.

Bordering Vegetated Wetland General Performance Standards
The applicant is advised to plan and construct the created wetlands area in accordance with *"Massachusetts Inland Wetland Replication Guidelines"* (MassDEP March 2002). An alternatives analysis should be submitted and the Commission should review all plans for compliance with the regulations.

Insufficient information is included in the ENF regarding any alternatives to the BVW alteration.

Stormwater
Although the project is redevelopment of an existing site, the applicant is proposing a net increase in impervious surface and therefore does not qualify as a *Stormwater Redevelopment* project. The project must fully comply with the ten stormwater standards.

Regulation requires that when proposing a development or redevelopment project subject to the Stormwater Management Standards, proponents shall consider environmentally sensitive site design (ESD) that incorporates low impact development (LID) techniques in addition to stormwater best management practices. The applicant is referred to the MassDEP *Stormwater Management Handbook.*

No information was submitted in the ENF regarding LID techniques or ESD.

Drinking Water and Wastewater

Stormwater infiltration
The proponent states that stormwater runoff from the facility will in part be directed to the subsurface. The underground injection of storm water through a structure is subject to the jurisdiction of the MassDEP *Underground Injection Control (UIC)* program. The structures must be registered with MassDEP UIC program through the submittal of a *BRP WS-06 a, b & c - Registration of Discharges to Underground Injection Wells / BRP WS-06 - Modification to an Existing UIC Registration* to the MassDEP Boston Office. The following MassDEP websites provide information regarding registration and forms:
http://www.mass.gov/dep/water/approvals/uicinfo.htm
http://www.mass.gov/dep/water/approvals/ws06abc.pdf.

MassDEP currently is proposing revisions to *314 CMR 5.00 Ground Water Discharge Permitting Program Regulations* requiring a General Permit for stormwater discharge into the ground from parking lots with high intensity use. This facility will be subject to that regulation based on the number of vehicle trips per day (>1,000 trips per day). A Fact Sheet, draft permit and draft regulations are available for review at the following MassDEP website:
http://www.mass.gov/dep/water/laws/stormf.doc.

The facility will be subject to one the regulations in place, at the time of permitting and construction. The applicant is advised to review the status of the proposed regulations during the project development process. The consultant should also be able to demonstrate that groundwater infiltration is feasible for this area with respect to the shallow groundwater table.

The proponent should request in writing, and receive confirmation from the Municipal facilities that will provide water and wastewater disposal, that adequate capacity, infrastructure and pressures are available to provide water to and dispose of wastewater from the project. Additionally, following construction, the applicant is advised to confirm compliance with all cross connection control requirements for the facility with the Water Department.

Bureau of Waste Prevention

Air Pollution
The construction and demolition activity must conform to current Air Pollution Control Regulations. The proponent should implement measures to alleviate dust, noise, and odor nuisance conditions that may occur during the construction and demolition activities. Such measures must comply with the MassDEP's Bureau of Waste Prevention (BWP) Regulations 310 CMR 7.01, 7.09, and 7.10 including written notification to the MassDEP at least ten days prior to performing any construction or

demolition work involving an industrial, commercial, or institutional building, or residential building with twenty or more units.

If any portion of the proposed project involves removal or abatement of regulated asbestos-containing material, an asbestos removal notification (AQ04) must be sent to MassDEP using the asbestos notification form ANF 001, at least 10 working days prior to initiating work. The handling and removal of asbestos from a facility and/or facility component must adhere to the requirements at 310 CMR 7.15.

It should be noted that there are air approval/permit requirements for boilers, incinerators, stationary turbines, reciprocating engines, emergency generator sets and other internal combustion engines (e.g. those associated with power generation units) that may or may not be applicable to this project. If any energy needs will be met through the combustion of liquid, gaseous, or solid fuels then such systems, may need to be certified (certain boilers depending upon their heat input capacities, and engines and turbines depending upon their rated power outputs) by the MassDEP pursuant to 310 CMR 7.26 and 310 CMR 70.00, may comply with 310 CMR 7.03, or approved by MassDEP pursuant to 310 CMR 7.02 unless otherwise exempted in 310 CMR 7.00. In addition, major sources are subject to the operating permit program and may be subject to New Source Review requirements. The proponent, if subject to these programs may seek a federally enforceable restriction to limit its emissions in order to avoid certain requirements. The proponent should refer to the aforementioned regulations to determine if any approval/permit threshold is exceeded by any on-site combustion process being proposed for the project and should evaluate its approval/permitting requirements/options.

On September 23, 2005, sections to the Air Pollution Control Regulations, 310 CMR 7.26(40) through (44) were adopted for engines and combustion turbines constructed, substantially reconstructed or altered after March 23, 2006. Revisions to 310 CMR 7.02(8)(i) and 310 CMR 7.03(10) were adopted for existing units. To implement these requirements, revisions were made to 310 CMR 7.02 Plan Approval and Emission Limitations, 310 CMR 7.05 Fuels, and 310 CMR 70.00 Environmental Results Program Certification.

Compliance with the Massachusetts Idling Regulation

The Massachusetts Idling regulation (310 CMR 7.11) prohibits motor vehicles from idling their engines more than five minutes unless the idling is necessary to service the vehicle or to operate engine-assisted power equipment (such as refrigeration units) or other associated power. The proponent should consider posting idling restriction signs on the premises to remind all drivers, patrons, and delivery personnel of the state's idling regulation. Questions regarding this regulation should be directed to Julie Ross of MassDEP at 617-292-5958.

Construction Period Air Quality Mitigation Measures

MassDEP believes it is necessary to mitigate the construction-period impacts of diesel emissions to the maximum extent feasible and thus recommends that the project proponent participate in the MassDEP Diesel Retrofit Program. Diesel emissions contain fine particulates that have been found to exacerbate a number of heath conditions, such as asthma and respiratory ailments. Fine particulate matter also contributes to lung damage and has been identified as a likely carcinogen.

MassDEP recommends that the project proponent work with its staff to implement construction-period diesel emission mitigation, which could include the installation of

after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs). MassDEP's guidance document, "Diesel Engine Retrofits in the Construction Industry – A How to Guide", is available on MassDEP's website at: http://www.mass.gov/dep/air/diesel/conretro.pdf.

In addition, low sulfur diesel (LSD) fuel which has a sulfur content of 500 parts per million (ppm), or 0.05% by weight, is currently required for off-road engines under federal regulation. Ultra low sulfur diesel (ULSD) fuel, with a sulfur content of 15 ppm, will be required for off-road engines in 2010. However, because of the current availability of ULSD, MassDEP recommends that construction equipment used on MEPA projects operate on ULSD fuel versus LSD fuel to reduce additional amount of fine particulate matter.

Solid Waste

The proponent shall properly manage and dispose of all solid waste generated by this proposed project pursuant to 310 CMR 16.00 and 310 CMR 19.000, including the regulations at 310 CMR 19.017 (waste ban). In addition, the proponent shall manage regulated asbestos and asbestos-containing waste material as special wastes in accordance with 310 CMR 19.061.

However, it should be noted that if asphalt, brick and concrete (ABC) will be crushed on-site and reused, the on-site crushing activity and reuse of these materials must comply with the exemption at 310 CMR 16.05(3)(e) including submission of a 30-day notification form to the MassDEP and the local Board of Health prior to the commencement of the crushing activity. Otherwise, the proponent would need to obtain a site assignment and facility permit for the crushing activity and a Beneficial Use Determination (BUD) for the reuse of the crushed material. More information regarding the handling of ABC, and a copy of the 30-day notification form may be found at: http://www.mass.gov/dep/recycle/laws/abc.htm.

As part of the October 7, 2005 regulatory amendments, the BUD regulations at 310 CMR 19.060 were also amended. The amended regulations establish levels of assessment for four categories of beneficial use. Similarly, the fee regulations at 310 CMR 4.00, et seq. were amended. These amended regulations would be applicable to reuse of any materials generated by this project that would otherwise be considered solid waste.

The project proponent should be advised that construction activity at the site must comply with both Solid Waste and Air Quality Control regulations. The appropriate Solid Waste provisions addressing this include M.G.L. Chapter 40, Section 54.

Hazardous Waste

Any hazardous wastes generated by the construction/demolition activities or universal wastes such as mercury containing lamps or mercury thermostats, must be properly managed in accordance with 310 CMR 30.0000.

Bureau of Waste Site Cleanup

This project is located within a 0.5-mile radius of disposal sites governed by the Massachusetts Oil and Hazardous Material Release Prevention and Response Act, M.G.L. c. 21E, which is implemented through regulations promulgated by MassDEP. The party conducting the work should retain a Licensed Site Professional (LSP) to review MassDEP's oil and/or hazardous material disposal sites list and associated files prior to start-up of the project, in order to determine contaminated areas that could pose a problem with onsite excavation activities. If soil and/or groundwater contamination is

encountered during excavation activities, the Massachusetts Contingency Plan (MCP) - 310 CMR 40.0460 - Utility-Related Abatement Measures (URAM) details procedures to follow for the parties installing, replacing, repairing, or decommissioning utility lines in suspected contamination.

The MCP regulations have made provisions for excavating and disposing of limited surficial soil contamination. Excavation would be performed as a "Limited Removal Action" (LRA), as specified in 40.0318. All excavation activities conducted, as a LRA must occur within 120 days of obtaining knowledge of soil concentrations greater than the reportable concentrations listed in the MCP.

However, during this 120-day time period, the regulations allow for the removal of up to 100 cubic yards of petroleum-contaminated soil or 20 cubic yards of hazardous material contaminated soil as a LRA. A specialized contractor is not required to perform the LRA, but must be supervised by someone knowledgeable with spill cleanups, such as an LSP. The contaminated soil must be managed and disposed of in accordance with 310 CMR 40.0030.

The party performing the LRA must notify the MassDEP, if the volume of soil exceeds 100 cubic yards for oil or 20 cubic yards for a hazardous material, in order to obtain approval for the removal of additional soil. If all the soil contamination has been removed (as determined by a knowledgeable party such as an environmental specialist, hazardous waste coordinator, or LSP), confirmatory soil samples must be collected to confirm that the concentrations are below the reportable concentrations. If the LRA activities fail to reduce soil concentrations to below the reportable concentrations within the 120 days, then formal notification must be provided to MassDEP. If the LRA exceeds the limits of 100 cubic yards for oil or 20 cubic yards for hazardous materials, then a Release Abatement Measure Plan must be submitted to MassDEP prior to continuing removal actions, as specified in 310 CMR 40.0443.

In addition, a spills contingency plan addressing potential releases during road construction activities, including but not limited to refueling of machinery and storage of fuels, should be enforced and presented to workers on site.

IV. Other Comments/Guidance

If you have any questions regarding this comment letter please do not hesitate to call Craig Givens at (413)-755-2217 or Email: craig.givens@state.ma.us.

Sincerely,

Michael Gorski
Regional Director

cc: Eva Tor
MEPA File

To: Aisling Englinton
From: Phil Weinberg & Meg Lusardi
Re: Center at Lenox: GREENHOUSE GAS ANALYSIS
Date: 11/12/08

This project includes 106,000sf of existing commercial space and construction of a new 13,225 foot stand-alone pharmacy and a 73,700sf bank and retail building. Although not addressed in the ENF, this project is subject to the MEPA Greenhouse Gas Emissions Policy and Protocol because the project requires a MHD Access Permit and an environmental impact report. The Protocol requires a proponent to quantify the direct and indirect CO_2 emissions from the project site's current status and compare it to a set of scenarios that compares the $C0_2$ emissions associated with a building's operation according to the currently applicable building code, build out with the proponent's preferred mitigation measures and a build out with the maximum practicable mitigation.

The baseline code compliant quantification of CO_2 related emissions must reflect the recent amendment to the Mass. State Building Code that incorporates the performance standards of the International Energy Conservation Code.
http://www.mass.gov/?pageID=eopsterminal&L=3&L0=Home&L1=Public+Safety+Agencies&L2=Massachusetts+Department+of+Public+Safety&sid=Eeops&b=terminalcontent&f=dps_feature_7th_edition_announce_completion&csid=Eeops
The IECC 2006 with 2007 supplements requires that commercial buildings must now be designed to meet ASHRAE 90.1-2007 rather than 2004. Although the all the Board of Building Codes and Standards (BBRS) allows use of either the 6th Edition or the 7th Edition until March 1, 2009, since this project is in the early stages of development, the 7th Edition should be used.

Alternatives with greater energy efficiencies allow an understanding of potential opportunities for energy savings achievable by varying building design and layout strategies. Energy efficient techniques not selected should be thoughtfully explained to demonstrate that the alternative selected has avoided, minimized, and mitigated CO_2 emissions adequately.

A project at this early stage of development provides a multitude of opportunities for designing buildings and transportation management measures that reduce energy consumption and substitute renewable energy sources for fossil fuel sources. MassDEP and the Department of Energy Resources (DOER) believe green developments are a smart financial investment. With a growing market demand for facilities that have reduced carbon footprints, rents are being driven higher for the US Building Council's Leadership in Energy and Environmental Design (LEED) certified buildings and Energy Star buildings than rents for less energy-efficient buildings, and occupancy rates are reported to be higher too by the CoStar Group[1], which released a study on rents, sales, and occupancy for energy efficient buildings in their commercial property database.

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[1] The full study can be viewed at the CoStar Group Inc. website: http://www.costar.com/news/Article.aspx?id=D968F1E0DCF73712B03A099E0E99C679. CoStar Group

In a study from the New Buildings Institute (NBI), it was reported that building performance averages are 25-30 percent more efficient for LEED certified buildings than non-LEED buildings, and gold-platinum LEED rated buildings are 45 percent better than the national average, which approaches the interim goals of Architecture 2030, (a non-profit organization dedicated to reducing GHG emissions by changing the way developments are planned, designed, and constructed). The NBI study also shows a good correlation between modeled and actual building performance, providing assurances to developers and regulators that these measures will be effective. Additional information on energy efficiency/renewable rating systems is available at a number of websites including: http://www.buildinggreen.com/, http://energystar.gov/, www.architecture2030.org/. For new construction, core and shell, and commercial interiors relating to LEED certified buildings, information is available on the following website: http://www.usgbc.org/DisplayPage.aspx?CMSPageID=222. In addition, for a Massachusetts perspective, consultation with green building experts can be obtained through the Green Building Roundtable: http://www.greenroundtable.org, located in Boston.

For the existing buildings, many of the efficiency measures discussed below would not be implementable because they need to be incorporated into the design to be cost effective. Others, such as high efficiency lighting should be evaluated. The Department strongly recommends that the proponent arrange for a comprehensive energy audit of the existing building and report the results of the audit and the measures it intends to implement in the DEIR. The audit results can be built into the emissions model for quantify the CO2 reductions. The Transportation Demand Management (TDM) measures the project may propose to reduce traffic-related emissions associated with deliveries, employees and customers accessing the project may also, of course, include the existing building.

Though it is unnecessary to provide a complete technological and financial analysis of all GHG reduction mitigation measures that may be applicable to the new construction, it will benefit the proponent to use functional and quantitative analyses and mock ups to assess feasible greenhouse gas reduction measures for the project type, starting with measures that offer the greatest energy reductions, and then considering opportunities to improve ongoing operations. These assessments should either lead to commitments to adopt LEED and/or Energy Star efficiency elements, or the subsequent filing should do a credible job in explaining why a particular efficiency or green power generation component is impracticable. Since there is, for example, no demonstration in the ENF that it would be technically infeasible or cost prohibitive to incorporate solar (photovoltaic) power on-site to generate energy for some of the building's functions, the subsequent should consider the feasibility of implementing this technology.

Even if on-site power generation is not feasible, many projects now routinely commit to orienting and designing buildings for energy efficiency. Additional information and assessment of energy efficient measures, as explained below, need consideration.

Inc. is an information services organization serving commercial real estate in the United States and the United Kingdom.

Additional information on building design energy reduction measures and standards is available on many websites, including the following: http://www.eere.energy.gov/, http://www.nahb.org,www.sbicouncil.org, http://www.aceee.org, http://www.ashrae.org/, http://www.coolroofs.org/ and http://www.ornl.gov.

As the project moves forward, it is recommended that the project proponent contact the New Construction division of its electric utility provider, NStar, and its natural gas provider, Berkshire Gas, to take advantage of all potential rebates available for the installation of highly energy efficient equipment.

The Department of Energy Resources (DOER) has identified several measures worthy of consideration in the subsequent filing for the new buildings, and adoption into the project, where feasible, as detailed below. In the event that the proponent is not able to adopt one of these measures, the subsequent filing must provide technical and cost information to document the rationale for not making a commitment to a mitigation recommendation.

Building Orientation - The subsequent filing needs to note clearly the buildings' orientation, why this orientation is chosen, and the expected impacts on energy usage.

Energy Efficient Lighting – The subsequent filing should provide information on the exterior and interior lighting. For interior spaces, enhanced or "Super T8" lighting, T5 or metal halide lighting should be installed, and for exit signs, LED lighting.

Interior Day-lighting – This measure should be thoroughly investigated for the subsequent filing, given that other retailers, such as Walmart, have incorporated interior day-lighting successfully into their retail space.

Duct Insulation – To enhance efficiency, in addition to duct insulation, the subsequent filing should note, and construction should reflect, that all ducts will be sealed with mastic, tested and then insulated, since duct leakage can be a major factor in energy losses.

Roof and Wall Insulation - The project proponent should evaluate using the highest R-value insulation possible. In general, providing the best building envelope possible provides the greatest gains in energy savings for building operations and insulation is generally very cost effective.

Windows – The subsequent filing should note the U-value of the windows to be used, which should be greater than code for the particular application.

High-Efficiency HVAC Systems – The subsequent filing needs to provide information regarding the HVAC system, including the heating system. Although there is a potential for additional first costs with highly efficient systems, more efficient units provide definite economic benefits over the life of the system.

High-Albedo Roofing Materials – The subsequent filing should fully consider these roofing materials, which are highly reflective and reduce cooling requirements for buildings.

Third Party Building Commissioning – The subsequent filing should fully consider building commissioning, and for it to be conducted by a third party to ensure the commissioning process is thorough and energy performance of the building is maximized. In accordance with the Green Communities Act, building code revisions will be issued that will make building commissioning required for all non-residential buildings greater than 10,000 square feet.

Lighting Motion Sensors, Climate Control and Building Energy Management Systems - To ensure that the energy systems function as designed long term, a strategy should be developed for monitoring energy performance of all buildings where the energy systems are centrally controlled, possible through a building management system. A building energy management system can incorporate basic energy saving measures such as lighting and climate control. Climate and lighting control should definitely be included for the building. Lighting control can provide savings for spaces that are occupied infrequently, such as storage areas. A system or strategy for monitoring energy performance would be expected to pay for itself through eliminating potential inefficient building energy operations, such as heating and cooling operating simultaneously in January.

On-site renewable energy – An adequate DEIR must include a life-cycle cost analysis that evaluates the installation of a PV system during project construction under two scenarios: 1) construction, ownership and operation of a PV system by the building owner; or 2) construction, ownership, and operation of a PV system by a third party that will then enter into a long-term power purchase agreement with the building owner for the electricity produced by the system. The assessment should factor in the subsidies available through the Commonwealth Solar, RPS programs and federal tax credits. If neither of these scenarios is economically feasible at this time, the project should indicate under what economic circumstances it would consider installing PV at a future date and consider committing now to installing PV when that condition was met or a third-party owned PV array was available under a favorable power purchase agreement. The following website provides information on the Commonwealth Solar program and tools for performing basic life cycle cost analyses:
http://www.masstech.org/renewableenergy/commonwealth_solar/index.html#

At a minimum, buildings should be oriented and roofs should be constructed to support the added weight of a solar photovoltaic (PV) system for potential installation during project construction or at a future date. Roof top HVAC and other utilities should be located on the north side to facilitate later PV installation. It should be noted that a rooftop PV system operates even more efficiently, due to added reflectivity, when installed on a high-albedo roof.

In addition to the measures discussed above, the DEIR should identify the traffic mitigation measures and Transportation Demand Management (TDM) necessary to reduce project generated emissions and project related trips. In particular, the ENF notes that the transportation company subsidizes certain passengers' fares. DEP suggests that the proponent explore whether a similar arrangement can me developed for the employees of businesses located within the project. Additional recommended measures should include, but are not limited to, the following measures:

- **Commuter Tax Benefit Program.** This transportation tax benefit program encourages employees to take transit or vanpools to work, providing transit and bus services are available within a mile of the project site. This program provides the added benefit of decreasing taxes for employers and employees.

- **Rideshare-Matching Program.** MassDEP recommends that the proponent establish a rideshare-matching program to match employees in carpools and/or vanpools. The project proponent could also enlist the services of a third-party provider to carry out this program.

- **Guaranteed Ride Home Program.** MassDEP recommends that the proponent establish an emergency ride home program for all project employees who travel by carpools/vanpools.

- **Additional Bicycle Incentives** MassDEP recommends that the proponent install adequate locker and shower facilities, and secure bicycle storage.

- **Car/Bicycle Sharing** MassDEP recommends that the proponent negotiate with car and bicycle sharing providers and dedicate adequate parking space to accommodate both car and bicycle sharing opportunities for residents, employees and patrons
- **Parking Management.** Develop a parking management program to minimize parking requirements such as parking cash-out, parking charges, limited parking available to employees, preferential carpool and vanpool parking.

Construction Period Air Quality Mitigation Measures

MassDEP strongly recommends that the project proponent commit to require all project contractors install after-engine emission controls, such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs), on diesel construction equipment. MassDEP's guidance document, "Diesel Engine Retrofits in the Construction Industry – A How to Guide", is available on MassDEP's website at http://www.mass.gov/dep/air/diesel/conretro.doc.

As of June 2007,all standard off-road diesel fuel must have no more than 500-ppm sulfur, and in 2010 the maximum sulfur level in off-road fuel will be reduced to 15 ppm. The 500-ppm fuel is known as low sulfur diesel (LSD) fuel while 15-ppm fuel is referred to as ultra-low sulfur diesel (ULSD) fuel. Because of the current availability of ULSD, MassDEP recommends the early use of ULSD fuel to reduce additional amounts

of fine particulate matter, which is associated with the state's high incidence of asthma and is a probable carcinogen.

MassDEP strongly recommends the project commit to comply with the Massachusetts Idling regulation (310 CMR 7.11). The regulation prohibits motor vehicles from idling their engines more than five minutes unless the idling is necessary to service the vehicle or to operate engine-assisted power equipment (such as refrigeration units) or other associated power. The proponent should post idling restriction signs in all loading and drop-off areas within the site to remind all drivers, patrons, and delivery personnel of the state's idling regulation. Questions regarding this regulation should be directed to Julie Ross of MassDEP at 617-292-5958.

Materials Management

In order to address GHG emissions related to materials management in the EIR, MassDEP requests that the applicant quantify the GHG impacts of materials management for the project development and projected future operation. By quantifying these impacts, the applicant's GHG mitigation efforts related to materials management can be more clearly identified and targeted appropriately. MassDEP seeks quantification to help guide changes in the project, which provide a comprehensive approach to materials management throughout the design, construction, and operational phases of the project. There are a number of resources available to help quantify GHG impacts associated with efficient materials management, including the USEPA Warm Model, available at the following website: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html, and the Building Reuse Calculator at: http://www.wastematch.org/calculator/calculator.htm.

During the **design phase**, MassDEP requests the applicant address waste reduction, environmentally preferable materials use, and the need to design for the storage and collection of recyclables. In order to plan for waste reduction, the applicant should consider implementing a waste prevention purchasing policy, which may include management options for reducing shipping and packaging materials, and if necessary, managing excess materials through unused product return or donation.

MassDEP also requests that the EIR provide the following information:

- a list of the environmentally preferred products to be used,
- the GHG impacts of using these materials, and
- an explanation for why an expanded commitment to use additional EPP materials (including on-site use of demolition materials, regionally produced materials, recycled content materials) is not applicable or cannot be confirmed.

The ENF does not address provisions for the storage and collection of recyclables, and MassDEP requests that specific information be provided on the square footage of the proposed storage area and the types of materials expected to be stored and recycled. The EIR should, at a minimum, demonstrate that the storage area would be sufficient to manage waste materials currently prohibited from disposal in Massachusetts. A list of

these materials can be found on the MassDEP website: http://www.mass.gov/dep/recycle/solid/regs0201.htm. In addition, MassDEP requests that the applicant identify how hazardous materials generated during facilities' operations, e.g., spent fluorescent bulbs, lubricants, waste oil, and other hazardous materials, would be managed and stored.

During the **construction phase**, MassDEP recommends that the applicant's material management efforts focus on material reuse and recycling. MassDEP requests the applicant commit to developing a construction waste management plan that fully complies with the Massachusetts Waste Bans and establishes a minimum reuse/recycling goal of 50 percent. The Department has demonstrated through pilot construction projects that this planning results in significant reductions in waste and cost savings for developers. Information and resources to assist in the development and implementation of a construction management plan can be found at http://www.mass.gov/dep/recycle/reduce/managing.htm#project.

In the **operations phase,** the applicant should develop and implement a waste management plan to ensure compliance with the MassDEP Waste Bans. The Department offers resources to assist in this area including planning tools, contracting language, and lists of service providers (http://www.mass.gov/dep/recycle/reduce/assistan.htm#reduce). The waste management plan should establish a target-recycling goal of more than 50 percent. This level of recycling has been achieved consistently in similar projects with demonstrated operational cost savings and capital asset appreciation benefits.

Since the project clearly triggers an EIR due to traffic impacts, it also will apparently trigger the new MEPA Greenhouse Gas Emissions Policy. BRPC is not prepared to comment upon that policy, other than to indicate that the ENF does not contain any analysis of the Greenhouse Gas Emissions being created by the project nor offer any mitigation. The provision of two drive-through lanes for the proposed pharmacy and two for the new/replacement bank would appear to create considerable vehicle idling which would seem to create additional greenhouse gas emissions.

BRPC encourages the proponent to consider green building standards, including energy efficiency and water conservation measure, and possible renewable energy generation such as a photovoltaic array atop the new buildings, as part of the project. Such considerations could be considered as part of a Greenhouse Gas Emission mitigation. This is a visible project that could serve to highlight and promote renewable energy generation, which is consistent with the new energy initiatives within the town of Lenox and the Commonwealth. The BRPC would be willing to work with the proponent to identify grant and loan funding that could help defray the up front capital costs of installing renewable energy structures.

BRPC urges the Lenox permitting authorities to work cooperatively and withhold issuing permits until the EIR public review process has been completed. The intent of MEPA is to review and analyze the cumulative potential environmental and cultural impacts of large development projects, while it also provides valuable opportunities for changes that could result in an improved project design and reduces environmental impacts. It should be noted that the Massachusetts Department of Environmental Protection, Western Region, and MassHighway District 1 prefer that proponents and local boards initiate the MEPA process as a first stage in the review and permitting of large projects.

While MEPA purview does not cover aesthetics or light pollution we urge the Lenox permitting authorities to carefully consider both the relatively poor appearance of the site and parking lot and the light pollution created by the existing site lighting in their review. A photogrammetric plan should be provided to show the levels of lighting and the local permitting authority should seek to eliminate unnecessary light pollution through requiring that all exterior lights be completely horizontally shielded. The suggested landscape strip between the curb on Rte. 7/20 and the relocated sidewalk should be planted with appropriate vegetation to improve the appearance of the center from the adjoining highway.

The Berkshire Regional Planning Commission Executive Committee endorsed these comments as amended at their meeting on November 6, 2008.

12.0 AIR QUALITY AND NOISE

12.1 Introduction

This section considers potential air quality impacts from mobile and stationary sources, presents a Greenhouse Gas Analysis and provides an analysis of potential noise impacts.

Potential impacts from mobile sources were estimated through a mesoscale analysis, discussed in Section 12.2.[1] The analysis includes both an estimate of the volatile organic carbon ("VOC") and nitrogen oxides (NOx) emissions associated with Project-related vehicle trips at intersections which trigger the mesoscale criterion. The analysis compares the VOC/NOx emissions associated with the Build conditions to those from the Existing and No-Build condition, and discusses mitigation measures that will be used to reduce the volume of vehicular traffic.

An overview of stationary sources is provided in Section 12.3. While the design of the site and its mechanical systems are still preliminary, anticipated emissions from stationary sources are not likely to trip source review thresholds. Some equipment will be required to be certified through the DEP Environmental Results Program.

In compliance with the MEPA Greenhouse Gas Emissions Policy and Protocol, a GHG analysis is presented in Section 12.4. GHG emissions from mobile sources were estimated for the Existing, No-Build, Build, and Build with mitigation scenarios. Regional emissions will be estimated using the study area chosen for the mesoscale analysis along with average daily traffic ("ADT") volumes and estimated mileage for each case.

Finally, a noise impact analysis is presented in Section 12.5. The analysis quantifies the sound level impacts from the operation of the facility (construction impacts are discussed in Section 14.0). The purpose of this noise impact analysis is to establish existing ambient sound levels at the nearest sensitive receptors to the proposed Plymouth Rock Studios site (Project) and to assess the potential operational noise impacts by comparing sound level modeling results to Massachusetts Department of Environmental Protection (DEP) Noise Policy and the Town of Plymouth Movie and Entertainment Production Overlay District (MEPOD) Bylaw.

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[1] A microscale analysis is also used to examine air quality impacts at a specific location where a violation of NAAQS might occur. Communications with DEP staff indicate this is not necessary for this project. Personal Communication, Jerome Grafe, Department of Environmental Protection, October 24, 2008.

12.2 Mesoscale Analysis

A mesoscale analysis was performed for the Project based on the estimated number of project-generated vehicle trips per day ("vtd") generated. The analysis includes both an estimate of the volatile organic carbon ("VOC") and nitrogen oxide (NOx) emissions associated with all Project-related vehicle trips. In the case where emissions from the build conditions are expected to be greater than the future no-build, the analysis includes identification and review of reasonable and feasible reduction and mitigation measures. The analysis was conducted consistent with the Massachusetts DEP mesoscale guidance and other similar projects.

A mesoscale analysis was performed to assess the total VOCs/NOx associated with motor vehicle emissions related to the Project. Transportation demand management ("TDM") and other mitigation strategies to reduce air quality impacts are described in Section 6.5.2.

12.2.1 Mesoscale Methodology

A mesoscale analysis predicts the change in regional emissions due to the Project. The total vehicle pollutant burden was estimated for the existing conditions and the build and no-build conditions for the future year 2018 based on the traffic analysis. The conditions are described in more detail in Chapter 6.

The EPA's MOBILE6.2 computer program was used to estimate motor vehicle emission factors of VOC and NOx on the roadway network. Conservatively, emission factors derived from MOBILE6.2 for VOCs/NOx are based on the worst case of either wintertime or summertime conditions. Using the vehicle count data, the mileage between intersections, and the emission factors, per day and per year emission estimates were calculated. MOBILE6.2 input parameters are provided in Appendix 12-1.

The traffic volumes provided in Section 6.5.2 form the basis of the mesoscale study. Approximately twenty five (depending on case) roadway links were included in the mesoscale analysis. Average daily traffic (ADT) volumes were provided by Vanasse to more accurately depict hourly variations in traffic. Average speeds and distances for many of the links were also provided by Vanasse.

12.2.2 Mesoscale Results

Results of the mesoscale analysis are presented in Table 12.3-1. The 2018 Build condition when compared to the Existing conditions shows a reduction of about 60% of NOx and 22% of VOC emissions. This is due to improved vehicle technology, which translates to improved future vehicular emission rates. The results show an increase in daily VOC and NOx emissions of about 28% and 23%, respectively, for the 2018 Build condition versus the 2018 No-Build condition.

12.2.3 Mitigation Measures and Conclusions

The Proponent has identified and reviewed reasonable and feasible reduction and mitigation measures to address the increase in emissions associated with the 2018 Build scenario. The proposed Build with Mitigation condition (Alternative 1 in the Traffic Analyses) was also evaluated and compared to the No-Build scenario. The proposed Build with Mitigation results in about a 25% increase of both NOx and VOC compared to the No-Build condition, or a less than 1% increase when compared to the Build condition without mitigation. This is a result of the proposed traffic improvements at the Route 3 and Clark Road interchange, including the proposed construction of two new on/off ramps and reconstruction of the existing ramps. Although the improvements would be expected to significantly improve air quality during the peak AM and PM hours, the improvements do not significantly alter the daily average speeds on the ramps enough to overcome the increased distance on the new ramps that vehicles must travel. Therefore the traffic improvements are not realized in daily emission estimates.

Table 12.2-1 Mesoscale Analysis Summary

Pollutant	Existing (tpy)	2018 No-Build (tpy)	2018 Build (tpy)	2018 Build minus No-Build (tpy)	Difference (Build minus No-Build) (%)	2018 Build with Mitigation (tpy)	2018 Build with Mitigation minus 2018 Build (tpy)	Difference (Build with Mitigation minus Build) (%)
VOC	16.1	9.9	12.7	2.8	28.3%	12.8	0.1	0.8%
NOx	55.1	17.6	21.5	4.0	22.6%	21.7	0.2	0.7%

A Transportation Demand Management (TDM) program will be implemented to reduce vehicle trips. The proposed traffic mitigation measures are described in detail in Section 6.5.2. These measures include alternative means of travel, rideshare programs, and telecommuting.

Calculation details for the mesoscale analysis are presented in Appendix 12-1.

12.3 Stationary Sources

There are a total of three development zones proposed for the Project, and each building in each zone will have individual heating boilers and emergency generators to provide heat, hot water and emergency power.

The Project is estimated to require twenty three boilers ranging in size from 0.25 to 8.8 million British Thermal Units (mmBtu) per hour heat input, seven emergency generators ranging from 300 to 2,500 kilowatts (kW) of electrical output. The feasibility of a

cogeneration (combined heat and power) facility capable is also under consideration; such a facility would produce 3 to 4.8 megawatts (MW) of electrical power and about 10,000 Btu/kW-hr of heat. The emergency generators will be limited to 300 hours of operation per rolling 12-month period (310 CMR 7.19(8)(b)(1)) and use only ultra-low sulfur distillate (ULSD) fuel. The boilers and cogeneration facility will have appropriate emissions controls, as necessary.

Very preliminary emissions estimates conducted for potential sources indicate annual NOx emissions below the 50 tpy threshold triggering nonattainment New Source Review. In addition, the emissions of the remaining criteria pollutants (SO2, CO, PM, and VOC) are all anticipated to be well below major source thresholds.

Each of these units is expected to be regulated under DEP's Environmental Results Program (ERP). This program requires that the Project certify and register, within a limited number of days of installation, that installed equipment meets the DEP emission limits and design specifications applicable to each type of equipment.

12.4 Greenhouse Gas Analysis

12.4.1 Introduction

This section addresses greenhouse gas (GHG) emissions generated by the Project and alternatives that may reduce those emissions, in accordance with the MEPA Greenhouse Gas Emissions Policy and Protocol (GHG Policy). The GHG Policy requires that certain projects undergoing review by the MEPA Office quantify the project's GHG emissions and identify measures to avoid, minimize, or mitigate such emissions. In addition to quantifying project-related GHG emissions, the GHG Policy also requires proponents to quantify the impact of proposed mitigation in terms of emissions and energy savings.

The analysis provided here focuses on project-related emissions of CO_2. As noted in the GHG Policy, there are other GHGs, but CO_2 is the predominant contributor to global warming, and emissions can be calculated for CO_2 with readily accessible data.

For this Project, CO_2 can be categorized into two groups: emissions related to activities that are stationary on the site and emissions related to transportation. Activities on the site can be further broken down into direct sources and indirect sources: direct sources include CO_2 emissions from combustion of natural gas on-site for space heating, primarily from the building HVAC systems, and indirect sources include CO_2 emissions associated with electricity that is imported and used on the site. In this case of indirect emissions, the CO_2 emissions occur in the production of electricity off-site, i.e. at a power plant. Emissions from on-site activities (both direct and indirect emissions) are discussed in Section 12.5.2, while emissions related to transportation are discussed in Section 12.5.3.

The GHG Policy requires the proponent to calculate and compare the GHG emissions in three cases, each of which incorporates all three of the above components:

Case 1 represents the base case where code-compliant buildings are used to model direct and indirect emission sources. Transportation-related emissions are modeled for the "build without mitigation" condition developed using the standard methodology outlined in the EEA/EOT Guidelines for EIR/EIS Traffic Impact Assessment.

Case 2 represents the proposed Project, including measures incorporated into the building and mechanical systems above and beyond those required for code compliance. Transportation-related emissions are modeled with the proposed physical transportation improvements in place (the "build with mitigation" condition) as well as a reduction in trip volumes associated with the implementation of a Transportation Demand Management program.

Case 3 represents a project alternative with greater GHG emissions-related mitigation than the proposed Project. In the analysis presented here, this case includes efficiency and sustainability measures the feasibility of which are still under investigation by the Proponent. The Proponent is in the process of evaluating the feasibility of incorporating additional design elements to further reduce energy use and resultant GHG emissions. These include:

- further enhancements to the building envelopes of individual, or groups of, Project buildings
- adding additional (above and beyond proposed solar voltaic arrays) renewable onsite electricity generation, such as wind and additional solar photovoltaic arrays
- utilizing additional solar/thermal collection for hot water heating
- adding a cogeneration plant to provide more efficient heating, cooling, and electrical supply for a portion of the Project's needs
- incorporating geothermal concepts into heating and cooling systems in portions of the Project

In addition, the Case 3 scenario incorporates an additional 10% reduction in traffic volumes that may occur if GATRA bus service were to be extended to the Project Site.

12.4.2 Stationary Sources – Direct and Indirect Emissions

The Plymouth Rock Studios Project is a complex project comprised of multiple buildings with a variety of individual uses and requirements, and so requires a complex analysis in order to evaluate and optimize energy efficiency and economics. As described in more detail elsewhere in this document (see Table 3.2.1 in Section 3.0), in general the facility is

divided into three building zones. Zone 1 is comprised of the production studios, offices, theater and supporting facilities. Zone 2 is comprised of retail space, a hotel, an apartment complex, other housing, restaurants and other similar and supporting buildings. Zone 3 is comprised of a 3-building educational and research complex. Ten individual single-family homes (associated with ten lots along Long Pond Road) are also included in this zone.

Two major considerations of energy use on the site are the building design, which can be designed to reduce energy needs, and the HVAC systems, which can be designed to more efficiently heat and cool buildings.

12.4.2.1 Building Design

The other critical component of indirect and direct energy use is building envelope design. Since the beginning of the Project, sustainability has been an important component of the design process and has been a driving factor in decisions around site selection, design, construction and operations. PRS is committed to developing a highly sustainable project.

At this time, the Project is registered with the U.S. Green Building Council to be LEED certified, and the proponent is looking at achieving Silver Certification, at a minimum, under the Core and Shell category for Campus Development. Table 5.2-1 in Section 5.0 provides additional detail about the various credits that the Project hopes to earn.

Certain building design elements that related to the energy efficiency and use of the buildings were compared in the Case 1 and Case 2 analysis of energy use. These parameters are listed in Table 12.4-2 in Section 12.4.2.2, below.

12.4.2.2 HVAC Systems

The primary HVAC components of the preliminary design of the three zones are described in Table 12.4-1, below. Elements of these systems are built into the Case 1 and Case 2 comparison presented in 12.5.2.4, and these parameters are listed in Table 12.4-2 in that section. Elements above and beyond these systems are discussed in the Case 3 analysis in Section 12.5.2.5.

Table 12.4-1 Proposed HVAC System

Zone/Building	HVAC Description
Zone 1	
All Buildings	A central heating and cooling plant with an approximate capacity of 6,000 tons of cooling and 44 MMBtu/hr (input) of heating. Utilities will be generated by four chillers and five boilers, and distributed via pumps throughout Zone 1 via buried piping.
Studios	Photovoltaic (PV) arrays of 500 kW total capacity will be added to the roofs of two studio buildings, with provisions allowing future expansion of the use of PV as economics dictate.
Commissary	Solar hot water heating to provide 50% of commissary needs.

Table 12.4-1 Proposed HVAC System (Continued)

Zone/Building	HVAC Description
Zone 2	
Hotel & Spa	900 ton chiller plant & 11,000 MBH (thousand Btu/hr) (input) boiler plant. Utilities will be generated by two chillers and five boilers, and distributed via pumps. Solar hot water heating to provide 50% of pool heating needs.
Apartments/Retail	Heat pumps served by a cooling tower with 400 tons of heat rejection capacity and boiler plant with a capacity of approx. 5,000 MBH (input) (approximately 3 boilers). Solar hot water heating to provide 50% of anticipated restaurant needs.
Visitor Center	Packaged Rooftop Unit w/ DX cooling (35 tons) and gas furnace heating (280 MBH input)
Bungalows	Distributed split system air conditioning units(total combined capacity: 33 tons) with gas furnace heating (total combined capacity: 750 MBH input)
Zone 3	
Education	Air-cooled chiller (100 tons) and boiler plant (1200 MBH input) (approximately3 boilers)
Research Offices	Evaporative-DX cooled rooftop units (125 tons) and heating by gas furnace (750 MBH input) and a boiler plant (for reheat coils, 500 MBH input) (approximately 2 boilers)
Housing	Split system air conditioning (70 tons combined) and a boilers for heating (1,500 MBH combined)

12.4.2.3 Measures Considered to Reduce Emissions

A comprehensive effort was undertaken to examine measures that could be used to increase efficiency, decrease energy use on the site, and overall to further the goal of creating a Project on the forefront of green building design and sustainability. Measures considered are described below. The feasibility and economic desirability of many of the measures is still under investigation, while some have already been adopted into the site design. The status of PRS investigation into the use of these technologies is summarized in Table 12.4-2.

Photovoltaics (PV)

The Proposed Project includes a 500 kW PV array pair on one pair of 24,000 sf studios, and the provision of electrical infrastructure to allow the future addition of PV on the remaining studios. The studios are the best locations for arrays, as their flat, open roofs would allow for relatively simple installation of high efficiency PV arrays. Estimated annual kWh produced by the proposed 500 kW PV array is 626,340 kWh, with an associated 693,358 CO_2 lbs/year avoided.

PV arrays on additional buildings are under consideration, including the visitors center, the office buildings, production services, the cultural center and the central utility plant. The payback perios for these buildings are anticipated to be greater; these applications of PV would have less funding from federal and state incentive programs to help reduce array first-cost and payback time. Currently, Massachusetts incentives are capped at 500kW on a

per-project basis (where a "project" is defined as a single metering point: all of Zone 1 will be on one meter, buildings Zones 2 and 3 are on individual meters), although the Massachusetts Technology Collaborative may increase the cap to 2MW. This cap significantly affects the ROI for PV on a building-by-building basis. Should system economics improve in the future, the facility will have the capability to expand its utilization of PV.

PV was considered and rejected for other buildings which are anticipated to have too much shading, such as the Zone 3 buildings, or incompatible roofs for PV panels.

Table 12.4-2 Sustainable Options Matrix

	Zone 1								Zone 2					Zone 3			
STRATEGY	**Studios**	**Production Services**	**Office**	**Commissary**	**Theater**	**Cultural Center**	**Music Studio**	**Central Utility Plant**	**Hotel**	**Bungalow**	**Retail Apart**	**Visitor Center**	**Spa**	**Research Office**	**Education**	**Homes**	**Parking**
Photovoltaic Array	500kW proposed ✓ remaining studios	✓	✓	X	X	✓	✓	✓	X	X	X	✓	X	X	X	X	X
Solar Thermal Heating	X	X	X	Proposed at adjacent office roof	X	X	X	X	Proposed pool DHW	X	Proposed (apartments & restaurant)	X	Proposed	X	X	X	X
Ground Source Heat Pump	X	X	X	X	X	X	X	X	X	✓	✓	✓	X	X	✓	✓	X
Heat Recovery	✓	X	X	✓	X	X	✓	X	Proposed	Proposed	Proposed	✓	Proposed	X	Proposed	Proposed	X
Rainwater Harvest[a]	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	X	✓	✓	X	X
High-Performance Building Envelope	Proposed 12" concrete w/ insulation ✓ Skylights	✓ Two 4" concrete w/ insulation	Proposed high performance glazing, exterior shade, light shelf	X	Proposed high performance glazing, exterior shade, light shelf	Proposed High perf. glazing, ext. shade, light shelf ✓ High perf R-value skylights	Proposed high perf. glazing, ext. shade, light shelf ✓ Skylights	✓ Skylights	✓	✓ Skylights	X	✓	✓	Proposed	✓ Skylights	X	X
Natural Ventilation	X	X	✓	X	X	✓	X	X	✓	✓	✓	✓	X	✓	✓	✓	✓
Cogeneration	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Micro Combined Heat and Power	X	X	X	X	X	X	X	X	X	✓	X	X	X	X	X	✓	X
Ice	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Fuel Cell	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Micro Turbine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Thermal Mass/Precooling	Proposed	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Radiant Heat	Proposed	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Note: "✓" indicates the application of the technology to the Project continues to undergo study, "x" indicates the technology was considered but rejected for that use

[a]Three studio roofs will be used for grey water harvesting; three studio roofs will be used for cooling tower make-up water at the central utility plant; Hilltop and education complex rainwater harvest will be used for grey water

Solar Thermal Hot Water Heating

Solar thermal hot water heating generates hot water using solar energy. A solar thermal system is comprised of collectors or an absorption field, a thermal storage component, and a distribution system.

To be economic, STHWH requires a year-round demand for the product hot water, with particular emphasis on summer load when a system is capable of producing its maximum output. The anticipated year-round major hot water loads for the PRS Project are domestic hot water used for cooking and shower loads, and water used for pool heating. STHWH was adopted for the commissary, hotel and spa, apartments and retail (restaurants).

STHWH was considered and rejected for other buildings which are not anticipated to have a high year-round annual hot water demand or which are located in a shaded area.

Ground Source Heat Pumps

The installation of an open-loop ground-source heat pump system, also known as a geothermal heating and cooling system or GSHP, is under consideration for the Visitor's Center, Education Building and for Retail buildings. GSHP is a system which uses the ground or ground water as a thermal energy source to heat a building, or as a thermal energy sink to cool a building. In an open loop GSHP system water is pumped out of the ground, circulated through a heat exchanger, then re-injected into the ground (the re-injected water is clean, since it has not touched anything other than piping and the heat exchanger). Studies have shown that geothermal heating and cooling systems can provide energy savings in the range of 15-30% annually for commercial applications when compared to conventional HVAC systems.

GSHPs were considered and rejected for buildings / zones with too high heating and cooling loads to be supported by this type of system.

Heat Recovery

Heat recovery ventilation (HRV - also known as a heat exchanger, air exchanger or air-to-air exchanger) is a ventilation system that employs a heat exchanger between the inbound and outbound air flow. HRV provide fresh air and improved climate control, while also saving energy by reducing the heating and cooling requirements. HRV was considered and adopted for many of the buildings in Zones 2 and 3. It was rejected for the remainder of the buildings which do not have dedicated and constant outside air streams, which are required to recover useful amounts of waste heat.

High Performance Building Envelope

High Performance Building Envelope was adopted for the majority of the Zone 1 buildings. It was considered and rejected for buildings where this is not feasible (i.e. the building is existing)

Natural Ventilation

Natural ventilation is the process of supplying and removing air through an indoor space by natural means rather than mechanical means. Natural ventilation was considered and rejected for certain of the production buildings which require an environmental separation from the ambient air for sound or other process reasons (i.e. stages, theater, etc.). It is still under consideration for the majority of buildings in Zones 2 and 3.

Cogeneration

Combined Heat and Power (CHP), also known as cogeneration, is the generation of two useful types of energy (typically electricity and steam) from a single fuel source. The standard CHP system is comprised of a prime mover (reciprocating engine or turbine generator) and a heat recovery unit. The prime mover generates electricity which partially powers the site. The heat recovery unit utilizes the waste and exhaust heat from the prime mover to produce hot water or steam. The hot water or steam can in turn be utilized to produce chilled water.

Depending on the design and application, CHP systems can have total efficiencies of 70% - 90%, much higher than the traditional utility generation with steam-cycle generators (25% to 45%) and combined cycle power plants (50% to 60%) due to the more complete utilization of the exhaust and/or waste heat from the prime mover. The higher efficiency of CHP results in lower emissions per unit of energy produced compared to traditional electrical and steam generating units.

Three CHP configurations based on two different engine-generator technologies, recuperated gas turbine and reciprocating engine, are now under investigation by PRS for potential use on the site. The energy requirements of the development program, the thermal and electrical profiles of these systems, their probable cost, and potential annual savings are being considered in this analysis.

Ice Storage and Fuel Cells

Ice storage, which mitigates the daytime peak demands for air conditioning loads, and fuel cells to produce electricity and, in some applications, low grade heat, are also being examined.

Micro-turbines

Very small combustion turbine-generators were considered and rejected because more carbon-neutral power is available from a neighboring wind turbine, which may be purchased by PRS.

Thermal Mass/Pre-cooling

This method of more efficiently heating and cooling a space, by shifting heating and cooling loads to non-peak times (when equipment can run more efficiently) via thermal mass, requires thermally massive construction to be effective. It has been adopted for the production studios, the largest buildings of the Project. It was considered and rejected for other spaces which are not anticipated to require or have such thermal mass due to architectural and construction requirements.

Radiant Heating

Radiant heating consists of "radiant energy" being emitted from a heat source. Radiant heating heats a building by radiation, rather than convection. Radiant heating was adopted for the production studios, and is under consideration for some supporting buildings in Zone 1. It was considered and rejected for other buildings for economic reasons, i.e. the HVAC did not gain significant benefits from radiant heating and better CO_2 reductions could be obtained by marginal investment in other sustainable technologies.

12.5.2.4 Direct and Indirect Emissions, Case 1 and Case 2

Direct and indirect emissions were modeled for two cases: the code compliant case ("Case 1") and the proposed Project ("Case 2"). These cases are as follows:

Case 1 represents the base case where code-compliant buildings are used to model direct and indirect emission sources. The code-compliant case utilizes the current building code (6th Edition Massachusetts Code).

Case 2 represents the proposed Project, including measures incorporated into the building and mechanical systems above and beyond those required for code compliance. The Proposed Project includes numerous design elements substantially improving its energy efficiency. Pursuant to the Green Communities Act, the Commonwealth is incorporating the International Energy Conservation Code into the State Building Code. The proposed design will be fully compliant with the provisions of the IECC and goes beyond IECC requirements in many areas. These include enhanced building envelope design, high-efficiency HVAC equipment, reduced area lighting, 500 kW PV array on studios 1 and 2, solar thermal hot water and improved equipment efficiencies (e.g., boilers, chillers motors).

The EQUEST model was used to estimate the building energy uses for Case 1 and Case 2. The EQUEST model is accepted by the U.S. Green Building Council for application in LEED energy modeling projects. Parameters included in the model for building envelope attributes for the two cases are listed in Table 12.4-3 below. Table 1 in Appendix 12-2 presents additional detail of the EQUEST model input for building design.

EQUEST modeling was conducted by Vanderweil Engineers.

Table 12.4-3 Building Envelope and HVAC System Attributes

Model Element	Case 1 (Code Compliant)	Case 2 (Proposed Project)
All systems		
Glazing U-value	0.5	0.3
Glazing SC	0.58	0.38
Lighting power density	Code levels	20% better than code
Boilers	80% efficient boiler	93% efficient condensing boiler
Domestic Hot Water[a]	80% efficient boiler	93% efficient
Solar Heated Hot Water[a]	No solar hot water heaters	844,250 MBH total in Zone 1 and 2
Economizers	Outside Air Temperature	Dual Enthalpy
Pumps	Standard Efficiency	High Efficiency
All systems except Sound Stages		
Wall Parameters	R-14	R-19
Roof : 10% glazing	R-19	R-24
Roof: 15-25% glazing	R-25	R-29
Roof: 30% glazing	R-30	R-35
All systems in Zone 1, Hotel Fan Coil and Spa Fan Coil in Zone 2		
Water-cooled chiller	EIR (energy efficency rating) = 0.162	EIR = 0.128
Economizers	OA Temperature	Dual Enthalpy
Boilers	80% efficient boiler	93% efficient condensing boiler
Pumps	Standard Efficiency	High Efficiency
Sound Stages VAV in Zone 1		
Wall parameters	R-14	R-35
Roof parameters	R-19	R-49
Radiant floor heating	HW from 80% efficient boiler	HW from 93% efficient boiler
Solar Panelsa	No PV	500 kW PV
Artist Bungalows in Zone 2		
Gas Fired Furnace	Non-condensing: HIR = 1.35	Condensing: HIR = 1.1
Student Fan Coil and Classroom Fan Coil in Zone 3		
Air-cooled chillers	EIR = 0.162	EIR = 0.128

Where:
U-value = measurement of heat value through a given material
SC = shading coefficient (measure of solar gain through glazing)
EIR = measure of how much electricity is required to produce a given cooling effect
HIR = measure of how much gas is required to produce a heating effect
R-= insulation value
OA = outside air temperature
[a]Not modeled in EQUEST; used yearly estimate provided by external calculation

The model results for onsite (direct) energy generation and imported (indirect) energy were utilized to calculate associated CO_2 emissions. Table 12.4-3 presents the resulting energy utilization and associated CO_2 emissions for the Project. Results for individual Zones 1, 2 and 3 are provided in Table 2, 3 and 4, respectively, in Appendix 12-2. Please note that the energy requirements (and associated CO_2 emissions) reported here are based on preliminary design and are subject to change as the design of the buildings and mechanical systems become more definitive.

As shown in Table 12.4-3, direct emissions from natural-gas firing of HVAC equipment will have natural gas utilization (direct energy consumption) 14.3% lower than the code-compliant case, with a corresponding CO_2 emissions reduction of 635 tons/yr.

Indirect emissions from the off-site generation of electricity used by the Project fall into two categories: that which is used by the owner-supplied systems and that which is utilized by tenant-supplied equipment. Owner-supplied equipment includes HVAC equipment and area lighting. Tenant equipment comprises the larger percentage of electrical use, but is not within the control of the Proponent. Examples of tenant-supplied equipment include stage and studio lighting for film production and laboratory equipment in the research facilities.

As presented in Table 12.4-4, the buildings' design and energy efficiency enhancements of the Project, including self generation of some electricity using PV panels, reduce projected indirect emissions from electricity consumption of the Proponent-supplied Project by 23.1% from the code-compliant case, with corresponding CO_2 emissions reduction of 2,388 tons/yr.

Table 12.4-4 Direct and Indirect Energy Use and CO_2 Emissions

		Case 1	Case 2	
Energy		**Code-compliant**	**Project Design**	**Savings**
	Gas	therms/yr	therms/yr	
	Space Heating	719,576	625,349	13.1%
	Domestic Hot Water	46,028	39,595	14.0%
	Solar Heated Hot Water Credit	-	-8,443	
	Total Project	765,604	656,501	**14.3%**
	Electricity	kWh/yr	kWh/yr	
	Space Cooling	4,871,939	3,657,528	24.9%
	Cooling Tower (Heat Rejection)	183,906	155,136	15.6%
	Ventilation and Fans	6,310,496	6,193,070	1.9%
	Pumps & Auxilary	6,805,302	4,354,553	36.0%
	Area Lighting	7,429,990	5,955,653	19.8%
	PV credit	-	-626,340	
	Total Project	25,601,633	19,689,600	**23.1%**

Table 12.4-4 Direct and Indirect Energy Use and CO_2 Emissions (Continued)

		Case 1	Case 2	
	Tenant equipment electricity	43,123,999	43,123,999	
CO_2 Emissions		tons/yr	tons/yr	
	Direct Emissions			
	Gas-burning	4,456	3,821	**14.3%**
	Indirect Emissions			
	Imported Electricity	10,343	7,955	**23.1%**
	Total Project (excl. tenant)	14,799	11,775	**20.4%**
	Tenant equipment	17,422	17,422	
Notes:				
Emission Factors				
	Electricity [1]	808	lbs CO_2/kWh	
	Gas [2]	116.4	lbs CO_2/MMBtu	
	[1] ISO-NE 2006 Marginal Emissions Rate Analysis, Table 5.12, 2006 value			
	[2] Unit Conversions, Emissions Factors and Other Reference Data, Nov 2004, US EPA			
Please note the results summarized here are based on preliminary design and are subject to change as the design of the buildings and mechanical systems becomes more definitive.				

12.4.2.5 Case 3: Additional Stationary Source Mitigation Measures

A series of measures are under consideration to provide reductions in energy use and CO_2 emissions at the site, as discussed in Section 12.4.2.2 and as summarized in Table 12.4-2. As noted, some measures are proposed for inclusion in the proposed Project; these have been incorporated into "Case 2" modeling. Others have been determined to be infeasible for practical or economic reasons. Still others are still under consideration; these measures comprise "Case 3", and include:

- A cogeneration plant (3.0 – 4.8 MW) to provide electricity and steam for heating and cooling.
- Additional PV arrays on one or more additional building including the studios, office, commissary, theater, cultural center, central utility plant, and visitors center.
- Ground-source heat pump at the retail/apartments complex, visitors center, education, homes and bungalows.
- Heat recovery at the studios, hotel, bungalows, retail/apartments, Spa, Education, homes, commissary, music studio and visitors center.

- Higher performance building envelopes at production services, central utility plant, hotel, bungalow, retail apartment, visitor center, spa, education center, such as skylights, high performance glazing, exterior shade, and light shelf.

- Natural ventilation at the office, cultural center, hotel, bungalows, retail/apartments, visitor center, research office, education center, homes, parking garage.

- Micro CHP at the bungalows.

- Fuel cells, under consideration for power and provision of heating and cooling.

- Radiant heat at production services.

Because such a varied group of measures are under consideration that would be incorporated into one or many different zones and building designs, it difficulties not feasible at this time to estimate the amount of additional CO_2 that would be reduced.

PRS will continue to evaluate these measures to determine the feasibility of adopting them into the program design.

12.5.3 Transportation-related Emissions

In accordance with the GHG Policy, CO_2 emissions within the mesoscale study area were estimated (see Section 12.3 for a discussion of the mesoscale analysis). For this study, the EPA's MOBILE6.2 computer program is used to estimate motor vehicle emission factors of CO_2 on the roadway network. Conservatively, emission factors derived from MOBILE6.2 for CO_2 are based on the worst case of either wintertime or summertime conditions. Using vehicle count data, the mileage between intersections, and the emission factors, per day and per year emission estimates were calculated. MOBILE6.2 input parameters are provided in Appendix 12-1. Average daily traffic (ADT) volumes were provided by Vanasse & Associates, Inc. (VAI) to more accurately depict hourly variations in traffic. Average speeds and distances for many of the links were also provided by VAI.

Case 1 Represents the build condition with no mitigation.

Case 2 Represents the build condition with transportation related mitigation, including:

- Alternative 1 Mitigation Scenario as described in Section 6.4. This includes the completion of the Route 3/Exit 3 interchange, the installation of a signal at Clark Rd/the proposed access road, the widening of Clark Road and construction of a modern round-about at the Clark Road/Long Pond Road intersection.

- Transportation Demand Management including pedestrian improvements, bicycle accommodations and traffic reduction strategies. A detailed description of the TDM measures that are proposed is provided in Section 6.5.2.3. In order to account for the use of public transportation by employees, visitors, students and residents of the Project, a 10 percent transit reduction was applied to the weekday daily, weekday morning and weekday evening peak hour primary trips associated with the commercial, educational and residential components of the Project. A transit reduction was not applied to the movie and production component of the Project as such trips are reflected in the methodology used to develop the traffic characteristics for Development Zone 1. A detailed discussion concerning the elements of the planned transportation mitigation program that have been designed to encourage the use of public transportation, including provision of a shuttle service between the Project, the MBTA commuter rail stations, MassHighway Park and Ride lots, and tourist information centers is presented in Section 6.0, Transportation.

Case 3 Public transportation services within the Plymouth area are provided by the Plymouth and Brockton Street Railway Company (P&B), the Greater Attleboro - Taunton Regional Transit Authority (GATRA), and the Massachusetts Bay Transportation Authority (MBTA). GATRA provides public bus service within the Plymouth area by way of four Plymouth Area Link (PAL) service routes that are generally located to the north and east of the Project site and the immediate study area. This case assumes that a PAL service route will serve the Project Site. It is expected that provision of PAL service to the Project site would have the potential to result in an additional 10 percent reduction in vehicle trips generated by the Project and has been assumed for this case.

Table 12.4-5 Transportation Related CO_2 Emissions

	Case 1	Case 2	Case 3
	2018 Build	2018 Build with Proposed Mitigation	2018 Build With GATRA Service to Site
Project VMT in mesoscale study area	47,776	45,186	42,856
CO_2 Emissions (tons/year)	6,916	6,664	6,436
Percent reduction	–	4%	7%

As shown in Table 12.4-5, the mitigation program results in a 4% reduction in CO_2 emissions, while adding the additional bus stop results in an estimated 7% reduction. While not modeled, provision of golf-carts and bicycle and pedestrian paths on the site will also minimize GHG emissions, relative to gasoline/diesel buses and gasoline vehicles.

12.5 Noise Impact Analysis and Mitigation

12.5.1 Executive Summary

This report presents a noise impact analysis performed for the proposed Project. The analysis quantifies the sound level impacts from the operation of the facility. The initial phase of the analysis involves establishing the existing, baseline sound levels at the locations near the Project that are included in the analysis. Baseline sound levels at the closest residential areas and at two schools abutting the Project site were measured during the daytime and nighttime. These sound level measurements represent the baseline sound levels at the Project property line, at the neighboring Plymouth South High School and Middle School, and at the closest residences on Long Pond Road, Mast Road, Bowsprit Lane and Martingale Lane. The existing sound levels are typical for a quiet suburban/rural area.

The operational noise impact analysis evaluated rooftop heating, ventilation, and air conditioning equipment (HVAC) equipment, cooling towers, and power generating sources, such as emergency generators, as regulated by the Massachusetts Department of Environmental Protection (DEP) Noise Policy and the Town of Plymouth Movie and Entertainment Production Overlay District (MEPOD) Bylaw. Sound power data from equipment manufacturers were incorporated into the acoustic model, and a worst case condition, simultaneous operation of all equipment at their maximum rated loads, was assumed. Future maximum sound levels at the nearest residences were calculated with the Cadna A acoustic model assuming simultaneous operation of all regulated sound sounds at their maximum loads. Cadna A is a comprehensive 3-D model. The maximum sound levels from the Project would increase the lowest daytime ambient levels that exist today by less than 1 dBA and up to 3 dBA, and would increase the lowest nighttime ambient levels by 2 to 5 dBA. All incremental changes in existing daytime and nighttime sound levels are below the 10-dBA incremental limit allowed by the DEP Noise Policy and MEPOD Bylaw. In addition, maximum sound levels from the Project will not contain "pure tones" as defined by the DEP Noise Policy. Thus, the Project would fully comply with the DEP Noise Policy and MEPOD Bylaw.

12.5.2 Noise Impact Analysis

The purpose of this noise impact analysis is to establish existing ambient sound levels at the nearest sensitive receptors to the proposed Plymouth Rock Studios site (Project) and to assess the potential operational noise impacts by comparing sound level modeling results to Massachusetts Department of Environmental Protection (DEP) Noise Policy and the Town of

Plymouth Movie and Entertainment Production Overlay District (MEPOD) Bylaw. The noise impact analysis also includes evaluating potential construction noise impacts (See Section 12.3). Recommended mitigation measures are also identified in both sections.

12.5.2.1 Existing Conditions

Common Measures of Community Sound Levels

The unit of sound pressure is the decibel (dB). The decibel scale is logarithmic to accommodate the wide range of sound intensities to which the human ear is subjected. A property of the decibel scale is that the sound pressure levels of two separate sounds are not directly additive. For example, if a sound of 70 dB is added to another sound of 70 dB, the total is only a 3-decibel increase (or 73 dB), not a doubling to 140 dB. Thus, every 3 dB increase represents a doubling of sound energy. For broadband sounds, a 3 dB change is the minimum change perceptible to the human ear. Table 12.5-1 below gives the perceived change in loudness of different changes in sound pressure levels.

Table 12.5-1 Subjective Effect of changes in Sound Pressure Levels

Change in Sound Pressure Level	Perceived Change in Loudness
3 dB	Just perceptible
5 dB	Noticeable
10 dB	Twice (or half) as loud

Non-steady noise exposure in a community is commonly expressed in terms of the A-weighted sound level (dBA); A-weighting approximates the frequency response of the human ear. Levels of many sounds change from moment to moment. Some are sharp impulses lasting one-second or less, while others rise and fall over much longer periods of time. There are various measures of sound pressure designed for different purposes. To establish the background ambient sound level in an area, the L90 metric, which is the sound level exceeded 90 percent of the time, is typically used. The L90 can also be thought of as the level representing the quietest 10 percent over a given time period. The Leq, or equivalent sound level, is the steady-state sound level over a period of time that has the same acoustic energy as the fluctuating sounds that actually occurred during that same period. It is commonly referred to as the average sound level. The Lmax, or maximum sound level, represents the one-second peak level experienced during a given time period. These measures are generally reported to the nearest whole decibel as broadband sound pressure level, i.e., broadband meaning includes sounds at all frequencies. Sound level

data also typically include an analysis of the sound spectrum into its various frequency components to determine tonal characteristics. The unit of frequency is Hertz (Hz), measuring the cycles per second of the sound pressure waves, and typically the frequency analysis examines eleven octave bands from 16 to 16,000 Hz. DEP Noise Policy states that a source creates a pure tone if acoustic energy is concentrated in a narrow frequency range and one octave band has a sound level 3 dB greater than both adjacent octave bands.

The acoustic environment in a suburban/rural area such as the Project site in Plymouth results from several sources. Major contributors are motor vehicle traffic on Route 3 and local roadways, aircraft overhead and natural sources, such as birds and insects. Typical sound levels associated with various activities and environments are presented in Table 12.5-2.

Table 12.5-2 Common Sound Levels

Sound Level (dBA)	Common Indoor Sounds	Common Outdoor Sounds
110	Rock Band	Jet Takeoff at 1000′
100	Inside NYC Subway Train	Chain Saw at 3′
90	Food Blender at 3′	Impact Hammer (Hoe Ram) at 50′
80	Garbage Disposal at 3′	Diesel Truck at 100′
70	Vacuum Cleaner at 10′	Lawn Mower at 100′
60	Normal Speech at 3′	Auto (40 mph) at 100′
50	Dishwasher in Next Room	Busy Suburban Area at night
40	Empty Conference Room	Quiet Suburban Area at night
25	Empty Concert Hall	Rural Area at night

12.5.2.2 Noise Regulations

DEP Noise Policy

The Massachusetts Department of Environmental Protection (DEP) regulates noise through 310 CMR 7.10, "Air Pollution Control". In these regulations "air contaminant" is defined to include sound and a condition of "air pollution" includes the presence of an air contaminant in such concentration and duration as to "cause a nuisance" or "unreasonably interfere with the comfortable enjoyment of life and property".

Regulation 7.10 prohibits "unnecessary emissions" of noise. The DEP Noise Policy (Policy Statement 90-001, February 1, 1990) interprets a violation of this noise regulation to have occurred if the source causes either:

(1) An increase in the broadband sound pressure level of more than 10 dBA above the ambient, or

(2) A "pure tone" condition

The ambient background level is defined as the L90 level as measured during equipment operating hours. A "pure tone" condition occurs when any octave band sound pressure level exceeds both of the two adjacent octave band sound pressure levels by 3 dB or more.

The DEP does not regulate sound from construction activity and does not regulate sound from motor vehicles accessing the site or delivery truck backup notification alarms as required by the Occupational Safety and Health Administration (OSHA). Therefore, the provisions described above only apply to the sound of mechanical equipment proposed for the Project and its operation.

Town of Plymouth

The Town of Plymouth does not have a general noise ordinance with decibel limits that would apply to this Project. The Town has established a Movie and Entertainment Production Overlay District (MEPOD) Bylaw. Section VIII. B of the Plymouth MEPOD Bylaw includes decibel sound level limits for this Project which are identical to the DEP Noise Policy. These regulations limit the Project sound level increases at the property line and the closest inhabited building to 10 dBA above existing background sound levels, and prohibits the creation of any pure tones, whereby the sound level in any octave band is 3 dB or more greater than the sound level in both adjacent octave bands.

Existing Acoustic Environment

Baseline sound level measurements were taken at locations near the Project. Daytime measurements were taken at five locations, four to represent the locations of the closest residences to the Project and one to represent the Plymouth South Middle and High Schools. Nighttime measurements were limited to the four residential locations. The five noise monitoring locations are shown in Figure 12.5-1, details of which are summarized below:

1) 440 Long Pond Road, Residential. Measurements were completed at the property line closest to expected sound sources from the Project.

2) #14 Mast Road, Residential. Measurements were completed in front of #14 Mast Road. This is the closest residence on this street to the Project.

3) #1 and #2 Bowsprit Lane, Residential. Measurements were completed between #1 and #2 Bowsprit Lane. These are the closest residences on this street to the Project

4) #1 Martingale Lane and #467 Long Pond Road, Residential. Measurements were completed between home locates at #1 Martingale Lane and #467 Long Pond Road. These are the closest residences on or near Martingale Lane to the Project.

5) Plymouth South Middle School and High School. Measurement was completed at the Project Site property line at a location that is conservatively representative of the Plymouth South Middle School and High School. By locating this measurement farther from Route 3, it results in a lower background sound level for the two school noise receptors. This would result in a higher predicted sound level increase from the noise impact analysis, which is conservative.

All measurements were taken by an acoustic engineer using a CEL model 593 real-time sound level analyzer equipped with a model CEL 250 ½" precision condenser microphone, windscreen, and frequency analyzer. The CEL model 593 analyzer has an operating range of 5 dB to 140 dB, and an overall frequency range of 3.5 to 20,000 Hz. This meter meets or exceeds all requirements set forth in the American National Standards Institute (ANSI) Type 1 Standards for quality and accuracy.

Prior to and immediately following the measurement session, the sound analyzer was calibrated (no level adjustment was required) with an ANSI Type 1 calibrator which has an accuracy traceable to the National Institute of Standards and Technology (NIST). All instrumentation was laboratory calibrated within the previous 12-month period. For the measurement session, the microphone was fitted with a 3" windscreen to negate the effect of air movement across microphone diaphragm. All data were downloaded to a computer following the measurement session for the purposes of storage and further analysis. The data are summarized in Appendix 12-3.

Daytime

Existing daytime baseline sound levels were measured at the closest residences on Long Pond Road, Mast Road, Bowsprit Lane, and Martingale Lane and at a location near the two schools. These measurements were completed between 9:15 a.m. and 11:15 a.m. to characterize the existing daytime sound levels at all five locations. In particular, the daytime measurements would be used to establish the daytime ambient sound level used in the DEP Noise Policy for the two schools, which are not occupied during the quietest period of the nighttime (between midnight and 4 a.m.). The nighttime period is of more concern for the residential locations.

Weather conditions during the daytime sound survey were acceptable for accurate acoustic measurements during the period from 9:15 a.m. and 11:15 a.m. on August 19, 2008. Skies were clear with no precipitation, temperatures ranged between 70oF and 80oF, and wind speeds were between 0 and 4 mph. The dominant sources of sound were motor vehicles on Route 3, Long Pond Road, airplanes overhead, and natural sounds (insects, birds, slight leaf rustling, etc.).

Summaries of the daytime sound measurement results are provided in Table 12.5-3. At the five measurement locations, average daytime sound levels (Leq) range from 49.9 to 57.6 dBA, maximum daytime sound levels (Lmax) range from 68.2 to 82.1 dBA, and daytime background levels (L90) range from 37 to 41 dBA. These L90 levels establish the ambient level for the daytime DEP Noise Policy and MEPOD Bylaw and serve as the basis for Project limits on regulated sources of sound. Under the DEP Policy and MEPOD Bylaw, offsite sound generated by the Project must not exceed 47 to 51 dBA (10 dBA higher than the measured background L90 sound levels), as shown in Table 12.5-3. Analyses of the measurements reveal a slight pure tone in the existing sound environment at 63 Hz caused by tire noise of vehicles on Route 3, and overall sound levels are typical of a quiet suburban/rural area. A second pure tone, in the 8,000 Hz range is also present at four locations, likely due to crickets.

Nighttime

Existing nighttime baseline sound levels were measured at the closest residences on Long Pond Road, Mast Road, Bowsprit Lane, and Martingale Lane. These measurements were completed during a late night period to characterize the quietest existing sound levels in the residential areas to establish the ambient sound level used in the DEP Noise Policy for the closest residential locations to the Project.

Weather conditions during the nighttime sound survey were acceptable for accurate acoustic measurements during the period from Midnight to 2:00 a.m. on August 19, 2008. Skies were clear with no precipitation, temperatures ranged from 55oF and 60oF, and wind speeds were between 0 and 4 mph. The dominant sources of sound were motor vehicles on Route 3, Long Pond Road, and Clark Road, and natural sounds (insects, birds, slight leaf rustling, etc.).

Summaries of the nighttime sound measurement results are provided in Table 12.5-4. At the four measurement locations, average nighttime sound levels (Leq) range from 43.0 to 57.6 dBA, maximum nighttime sound levels (Lmax) range from 62.8 to 84.1 dBA, and nighttime background levels (L90) range from 32.0 to 35.6 dBA. These L90 levels establish the ambient level for the DEP Noise Policy and MEPOD Bylaw and serve as the basis for Project limits on regulated sources of sound. Under the DEP Policy and MEPOD Bylaw, offsite sound generated by the Project must not exceed 42.0 to 45.6 dBA (10 dBA higher than the measured background L90 sound levels), as shown in Table 12.5-4. Analyses of the measurements reveal a pure tone in the existing sound environment in the 4,000 Hz range at three locations, likely due to crickets, and overall sound levels are typical of a quiet suburban/rural area.

Table 12.5-3 Existing Daytime Baseline Sound Levels at Locations Near the Project Site 9:15am to 11:15am August 19, 2008

Sound Level Measurement	Location 1 #440 Long Pond Road and Property Line	Location 2 #14 Mast Road	Location 3 #1 and #2 Bowsprit Lane	Location 4 #1 Martingale Lane and #467 Long Pond Road	Location 5 Plymouth South Middle School and High School
Octave Bands L_{90}(dB)					
16 Hz	32	32	33	33	33
31.5 Hz	39	38	38	39	39
63 Hz	43	42	42	42	44
125 Hz	40	37	40	39	38
250 Hz	31	31	33	34	33
500 Hz	31	30	33	34	32
1,000 Hz	31	30	33	35	32
2,000 Hz	27	27	30	31	26
4,000 Hz	32[a]	25	27	29	22
8,000 Hz	30[a]	26	29	27[a]	20[a]
16,000 Hz	25[a]	17	19	24	18
Broad Band (dBA)					
L_{max}	68.2	82.1	73.5	72.4	71.9
L_{eq}	49.9[a]	51.6	54.6	57.6	47.7
L_{90}	38.0[a]	37.0	39.0	41.0	37.0
Existing Pure Tone Condition?	**Yes, 63 and 8,000 Hz.**	**Yes, 63 and 8,000 Hz.**	**No.**	**Yes, 63 and 8,000 Hz.**	**Yes, 63 and 8,000 Hz.**
DEP Noise Policy Limit (dBA)[b]	48.0	47.0	49.0	51.0	47.0

[a] These numbers have been corrected for excessive cricket and insect interference.

[b] Defined as a 10 dBA incremental increase relative to the existing nighttime baseline (L_{90}).

Table 12.5-4 Existing Nighttime Baseline Sound Levels at Locations Near the Project Site Midnight to 2:00 am August 20, 2008

Sound Level Measurement	Location 1 #440 Long Pond Road and Property Line	Location 2 #14 Mast Road	Location 3 #1 and #2 Bowsprit Lane	Location 4 #1 Martingale Lane and #467 Long Pond Road
Octave Bands L_{90}(dB)				
16 Hz	24	23	24	28
31.5 Hz	29	29	29	32
63 Hz	31	31	32	33
125 Hz	29	28	31	30
250 Hz	28	25	27	25
500 Hz	28	24	24	25
1,000 Hz	28	24	24	24
2,000 Hz	29 [a]	26 [a]	24	24
4,000 Hz	29 [a]	26 [a]	25	23 [a]
8,000 Hz	25	22	19	22
16,000 Hz	16	15	15	15
Broad Band (dBA)				
L_{max}	62.8	84.1	67.1	64.9
L_{eq}	43.0 [a]	57.6	43.3	44.3
L_{90}	35.6 [a]	32.3 [a]	32.0	34.0
Existing Pure Tone Condition?	**Yes, 4,000 Hz.**	**Yes, 4,000 Hz.**	**No.**	**Yes, 4,000 Hz.**
DEP Noise Policy Limit (dBA)[b]	45.6	42.3	42.0	44.0

[a] These numbers have been corrected for excessive cricket and insect interference.

[b] Defined as a 10 dBA incremental increase relative to the existing nighttime baseline (L_{90}).

12.5.3 Impacts and Mitigation

Operational Noise Impacts

The noise impact analysis evaluated rooftop heating, ventilation, and air conditioning equipment (HVAC) equipment, cooling towers, and power generating sources, such as emergency generators as regulated by the DEP Noise Policy and MEPOD Bylaw. Sound power data from equipment manufacturers were incorporated into the acoustic model, and a worst case condition, simultaneous operation of all equipment at their maximum rated

loads, was assumed. This is a conservative assumption since it is highly unlikely that all would operate continuously at full load conditions for extended periods. Table 12.5-5 presents a summary of the operational sound source reference sound level data.

To minimize sound levels generated by operational noise sources, the following sound attenuating design features were included in the acoustic model:

- Housing 300 and 500 kilowatt (kW) outdoor emergency generators in sound attenuating enclosures and installing silencers on the exhaust.
- Housing the Central Utility Plant larger 2500 kW emergency generators inside the building and installing acoustic louvers.
- Housing the sound stage air handling units (AHUs) in penthouses.
- Sheilding visible roof top HVAC behind screens.
- Constructing 15-foot high earthen berms along the southern and western boundaries of the sound stages and back lot area.

Future maximum sound levels at the nearest residences were calculated with the Cadna A acoustic model assuming simultaneous operation of all regulated sound sounds at their maximum loads. Cadna A is a comprehensive 3-D model based on International Standard ISO 9613 modeling techniques for sound propagation and attenuation. Atmospheric absorption is the process by which sound energy is absorbed by the air and was calculated using ANSI S1.26-1995. ISO 9613 was used to calculate propagation and attenuation of sound energy by hemispherical divergence with distance, surface reflection, ground, and shielding effects by barriers, buildings, and ground topography. Offsite topography was determined using official USGS digital elevation data for the study area from MassGIS.

Table 12.5-5 Summary of Operational Sound Source Reference Sound Level Data[2]

Noise Sources	Sound Power Levels (dBA)
Low Noise Cooling Towers	96-100
Rooftop Exhaust fans	86
Air Cooled Chillers and Coolers	83
Emergency Generators[1]	70-97
Low Noise Air Handling Units[2]	81
Mill Shop Dust Collector	73
Back Lot Operations[3]	104
Backup Alarm[4]	109

[1] Emergency generators would be either located inside buildings or enclosures with exhaust silencers.
[2] Low noise air handling units would be housed in penthouse or behind visual screens.
[3] Backlot operations are based on occasion minor construction activities and people talking.
[4] Backup alarms would only operate periodically during delivery of sound stage during pre- and post-production movie operations.

Future maximum sound levels were predicted at the closest sensitive receptors:

- Location 1 - #440 Long Pond Road
- Location 2 - #14 Mast Road
- Location 3 - #1 Bowspirt Lane
- Location 4 - #2 Bowspirt Lane
- Location 5 - #467 Long Pond Road
- Location 6 - #1 Martingale Lane and
- Location 7 – Plymouth South Middle and High Schools

Future sound levels were calculated at the noise sensitive receptors that could receive the greatest potential effects from the Project. Sound levels were predicted at five feet above ground level at each noise sensitive receptor. The results of these calculations are presented in Tables 12.6-6 and 12.6-7. Model output is summarized in Appendix 12-3. Maximum sound levels from the Project are only 32 to 38 dBA.

[2] Reference sound level data obtained from equipment manufacturers, such as Caterpillar, Donaldson Torit, SPX Cooling Technologies, TECs (air cooled chillers) and York; field measurements and U.S. EPA guidance documents.

The maximum sound levels from the Project would increase the lowest daytime ambient levels that exist today by less than 1 dBA and up to 3 dBA, and would increase the lowest nighttime ambient levels by 2 to 5 dBA. All incremental changes in existing daytime and nighttime sound levels are below the 10-dBA incremental limit allowed by the DEP Noise Policy and MEPOD Bylaw. In addition, the results of the modeling analysis indicate that the Project would generate no "pure tones," according to the DEP Noise Policy. Thus, the Project would fully comply with the DEP Noise Policy and MEPOD Bylaw. In practice, actual sound levels from the Project would be less than those provided in Tables 12.6-6 and 12.6-7 since it is unlikely that all sound sources would operate simultaneously, and careful equipment specification would ensure that no pure tones would be generated the Project.

Figure 12.5-2 presents color-coded decibel contours for the maximum sound impacts from the Project. The sound level predictions are made for an elevation of five feet above ground level, or about the height of the ears of a standing person. Figure 12.5-2 reveals that the maximum Project sound levels in residential areas beyond the seven closest locations would be at or below 35 dBA, a very low sound level. Under this worst-case condition operating condition, daytime sound levels from the Project would be imperceptible to barely perceptible and nighttime sound levels from the Project would be imperceptible to possibly noticeable at nighttime. Under normal operating conditions, it is anticipated that sound levels from the Project would be imperceptible. The type of sound a person sensitive to noise would hear would be characterized as a very low hum typical for noise emanating from building mechanical equipment or fans.

Although both the DEP Noise Policy and MEPOD Bylaw do not regulate backup alarms, it was included in the noise impact analysis to assess its potential impact on nearby noise sensitive areas. It is anticipated that 18-wheel trucks would make deliveries in the sound stage area once or twice a week. These infrequent deliveries may require trucks to backup into the loading dock area of a sound stage requiring the use of a backup alarm. To represent this infrequent activity, a backup alarm at the closest sound stage/production support buildings to Long Pond Road was entered in the Cadna-A model. A backup alarm sound level along with the other continuous sound sources operating simultaneously would increase existing ambient noise levels at the residential receptors by no more than 6 dBA at anytime, day or night. Because of the nature of backup alarms, a pure tone sound level could occur at some locations closest to a backup alarm operation.

Other Existing Background Sound Sources

For the purposes of addressing public comments raised at the August 27, 2008 Planning Board Meeting Workshop, this section of the report evaluates other existing background sound sources in the Project area that have been known to cause annoyance for nearby residential neighbors. One of these sources is marching band competitions held at the Plymouth South High School. In addition, school bus traffic entering and exiting the school property onto Long Pond Road. The other potential sound source is located more than a mile away is seaplane landing and takeoff training exercises on Long Pond. The purpose of

evaluating these existing background sound sources is to provide a comparison to potential worst-case sound levels from the Project. Each of these other background sound sources, and their potential sound level contributions to the nearest residential receptors on Long Pond Road, are discussed below.

Table 12.5-6 Summary of Predicted Daytime Sound Levels from Plymouth Rock Studios at the Closest Noise Sensitive Areas

Noise Sensitive Areas	Lowest Measured Background Sound Level (L_{90}) (dBA)	Predicted Maximum Sound Level from Project (dBA)*	Total Predicted Sound Level (dBA)	Predicted Sound Level Increase (dBA)	Complies with Noise Regulations?
Location 1 #440 Long Pond	38.0	37.8	40.9	2.9	Yes
Location 2 #14 Mast Road	37.0	35.4	39.3	2.3	Yes
Location 3 #1 Bowsprit Lane	39.0	33.3	40.0	1.0	Yes
Location 4 #2 Bowsprit Lane	39.0	34.9	40.4	1.4	Yes
Location 5 #467 Long Pond Rd.	41.0	32.7	41.6	0.6	Yes
Location 6 #1 Martingale Lane	41.0	32.0	41.5	0.5	Yes
Location 7 Plymouth South Middle & High Schools	37.0	34.2	38.9	1.9	Yes

* Assumes simultaneous operation of all regulated sources on the Project site at maximum load.

Table 12.5-7 Summary of Predicted Nighttime Sound Levels from Plymouth Rock Studios at the Closest Noise Sensitive Areas

Noise Sensitive Areas	Lowest Measured Background Sound Level (L_{90}) (dBA)	Predicted Maximum Sound Level from Project (dBA)*	Total Predicted Sound Level (dBA)	Predicted Sound Level Increase (dBA)	Complies with Noise Regulations?
Location 1 #440 Long Pond	35.6	37.8	40.2	4.2	Yes
Location 2 #14 Mast Road	32.3	35.4	37.7	4.8	Yes
Location 3 #1 Bowsprit Lane	32.0	33.3	37.3	3.7	Yes
Location 4 #2 Bowsprit Lane	32.0	34.9	36.7	4.7	Yes
Location 5 #467 Long Pond Rd.	34.0	32.7	36.4	2.4	Yes
Location 6 #1 Martingale Lane	34.0	32.0	36.1	2.1	Yes

* Assumes simultaneous operation of all regulated sources on the Project site at maximum load.

Marching band sound levels may range from 85 dBA at 3 feet away for clarinets, to up to 106 dBA at 3 feet away for snare drum with marching percussions. An overall sound level of 108 dBA at 3 feet away was input into the Cadna-A model to estimate potential sound levels at the nearest residential receptors in the Long Pond Road neighborhood. The predicted broadband sound levels ranged from 34 to 40 dBA, which are comparable to the broadband sound levels anticipated from Plymouth Rock Studios activities under worst-case operations. Sounds from Plymouth Rock Studios, however, are not equivalent to those from a marching band because a band has pure tone sources that are easily heard against the background while the low-level sound from Plymouth Rock Studios will not contain pure tones and will be indistinguishable from background at most times.

A maximum sound level of 58 dBA at 50 feet away was estimated for 20 school buses entering and leaving the Plymouth South Middle and High School property traveling at 15 miles per hour on the school access road. This sound source was entered into the Cadna-A model to estimate the projected sound levels at the nearest residences in Long Pond Road neighborhood. The predicted sound ranged from 28 to 37 dBA. These sound levels are comparable to the sound levels anticipated from Plymouth Rock Studios activities under

worst-case operations. Sounds from Plymouth Rock Studios, however, are not equivalent to those from bus traffic because buses produce a distinctive low-tone noise that is easily heard against the background while the low-level sound from Plymouth Rock Studios will not contain pure tones and will be indistinguishable from background at most times.

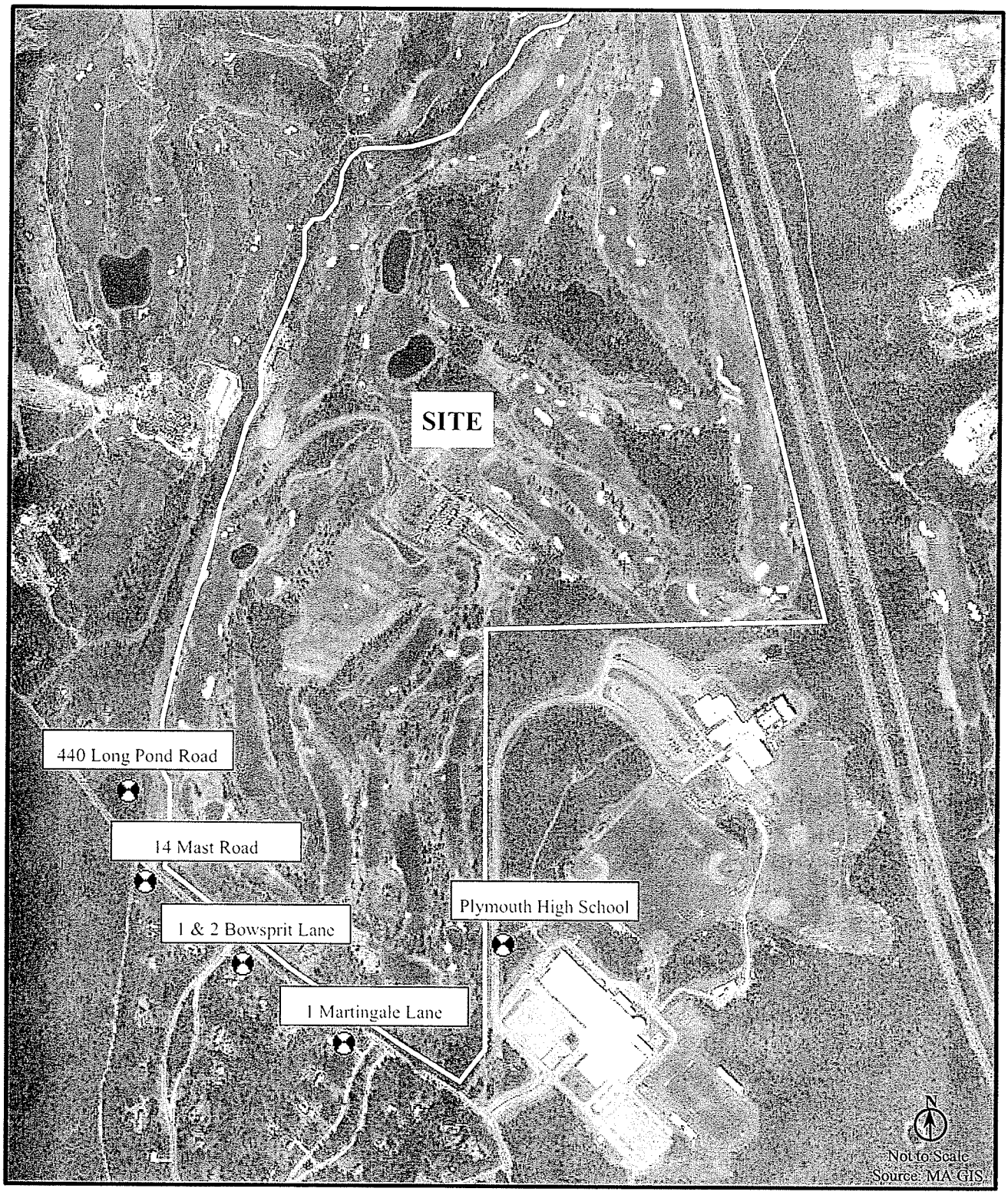
Seaplane peak instantaneous sound levels range from 78 dBA at 1,000 feet for a Taylorcraft seaplane to 101 dBA at 1,000 feet for a Cessna (C-185) seaplane . It was conservatively assumed that a C-185 seaplane would make up to six landing and takeoff operations during a peak hour at Long Pond. The estimated broadband one-hour average sound level at the closest residential receptor on Long Pond Road to the Project site is 54 dBA.

Table 12.5-8 presents a summary of the maximum sound levels for each noise source and the projected sound levels at the nearest sensitive receptors. Appendix 12-3 presents the model outputs and calculations.

Table 12.5-8 Maximum Sound Levels Associated with Other Existing Background Sources at the Closest Noise Sensitive Areas

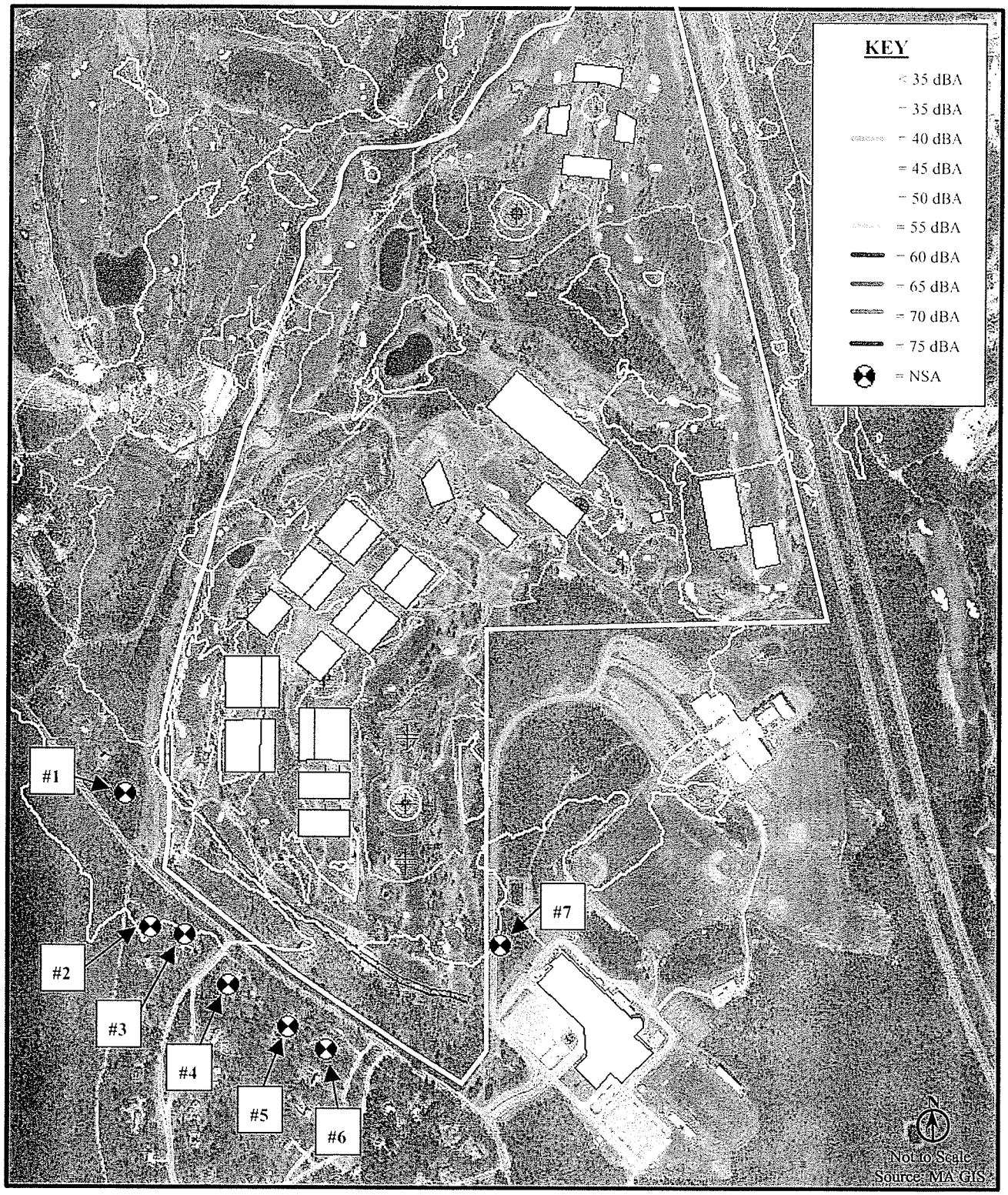
Noise Source	Maximum Sound Level	Projected Sound Level at Nearest Residences
Marching Band Outdoor Rehearsals	108 dBA @ 3 ft. away	34-40 dBA
Cessna 185 Seaplane at Long Pond	101 dBA at 1000 ft. away	54 dBA*
School Buses Entering & Leaving School Property	58 dBA at 50 ft. away	28-37 dBA

* Average sound level over a peak one-hour period based on six landing and takeoff operations.



Prepared by TECH

Figure 12.5-1
Sound Monitoring Locations



Prepared by TECH environmental

Figure 12.5-2
Maximum Project Sound Levels

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January 16, 2009

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
EXPANDED ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Plymouth Rock Studios
PROJECT MUNICIPALITY	: Plymouth
PROJECT WATERSHED	: South Coastal Watershed
EOEA NUMBER	: 14345
PROJECT PROPONENT	: Plymouth Rock Studios
DATE NOTICED IN MONITOR	: November 24, 2008

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62I) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of a mandatory Environmental Impact Report (EIR) and that the proponent may fulfill its MEPA obligations through the filing of a Single EIR. In a separate Draft Record of Decision (DROD) also issued today, I propose to grant the request for a Phase 1 Waiver that will allow construction of the access road to proceed prior to completion of MEPA review for the overall project.

Project Description

Plymouth Rock Studios proposes to develop the east coast's first independent, full-service film and television studio facility in Plymouth, MA. It will create an economic engine that will generate more than 2,000 jobs, provide a unique tourist attraction, serve as an educational resource for potential employees and students and support the Commonwealth's efforts to attract the film industry to Massachusetts. The project includes a noteworthy commitment to design and build a state-of-the-art, green and sustainable studio that will minimize the project's environmental footprint, provide exposure for renewable energy

technologies, including a 500 kilowatt (kw) solar photovoltaic (PV) system, and serve as a model for developers in Massachusetts and studio heads in Hollywood. The proponent has worked closely with the Town of Plymouth and its residents to identify an appropriate site for the project and to address local concerns. The comment letters received on this project reflect genuine support and excitement for the project and its goals.

The project consists of the construction of a 1,292,000 gross square feet (gsf) Studio Production Campus (including 14 sound stages, a 10-acre back lot, production service buildings, office buildings, a theater and a visitor center), a 519,000 gsf Studio Amenities Campus (including\ shops, restaurants, a hotel and housing) and a 189,000 gsf Research/Education Campus (including research and education buildings). Primary access to the site will be provided by a new access road extending from Clark Road to the project site. The access road will include extensions to the South School Educational Complex and to Forges Field. In addition, a multi-use path will be constructed within the same corridor as the roadway. Secondary access will be provided from Long Pond Road via the existing Waverly Oaks Drive. Other roadway improvements include: construction of a modern roundabout at the Clark Road/Long Pond Road intersection; completion of the Route 3/Exit 3 interchange; signalization of the access road/Clark Road intersection; widening of Clark Road between the Route 3 southbound ramps and Long Pond Road; and pedestrian, bicycle and traffic calming improvements along Long Pond Road. Wastewater will be conveyed from the site to the Camelot Drive Wastewater Treatment Plant (WWTP) via a new sewer extension. Water supply will be provided either through connection to the municipal supply or through construction of an on-site well. The sewer extension and water supply will be designed to serve the project and the South School Educational Complex. The project will include approximately 4,190 parking spaces located in surface parking lots and parking garages.

Project Site

The 242-acre site is located between Long Pond Road and Route 3 near Interchange 3. The site is bounded by Crosswinds Golf Course to the west and northwest, Forges Field Recreational Complex to the north, Route 3 to the east, the South School Educational Complex to the south and east and Long Pond Road and existing residences to the southwest. The northeast portion of Myles Standish State Forest is located to the west of the site. The site consists of a 27-hole golf course, a club house, ancillary support structures, parking lots, access roads, an irrigation system, drinking water wells, three lined ponds associated with the irrigation and stormwater management systems, a single family home and 9 housing lots. The site contains forested upland areas and three isolated wetland resource areas (only one of which is subject to jurisdiction under the Wetlands Protection Act). It is located within the Eel River Subwatershed of the South Coastal Basin.

The project includes off-site transportation improvements and utility infrastructure which may extend from the Route 3/Clark Road corridor north to the Camelot Drive Wastewater Treatment Plant and the Bradford Water Supply. The geographic extent of these improvements will depend on the preferred alternatives identified through the MEPA process. The utility

corridor is located within areas identified in the Massachusetts Natural Heritage Atlas (13th Edition) as *Priority Habitat.*

Construction of the access road will extend from the Route 3/Clark Road corridor through a 207-acre parcel of conservation land to the South School Educational Complex, the site and to the Forges Field Recreational Complex. The conservation land is bounded by Route 3 to the east, Clark Road to the south, Long Pond road to the west and the South School Educational Complex to the north. The site is owned by the Town of Plymouth and is protected by Article 97 of the Articles of Amendment to the Constitution of the Commonwealth of Massachusetts under a conservation restriction held by the Wildlands Trust of Southeastern Massachusetts. It is an undeveloped, wooded parcel and includes two certified vernal pools. In addition, the Town of Plymouth has identified a potential water supply on the site.

Environmental Impacts

Potential environmental impacts associated with redevelopment of the project site include the alteration of 112 acres of land, creation of an additional 53 acres of new impervious area for a total of 65 acres of impervious area and generation of an additional 8,950 average daily vehicle trips (adt) for a total of 9,916 adt. Water use and wastewater generation will decrease by approximately 144,000 gallons per day (gpd) and 162,420 gpd compared to the previously reviewed Waverly Oaks Golf Club.

Potential environmental impacts associated with the access road include alteration of 19.4 acres of conservation land and creation of 6.3 acres of impervious surfaces. Potential environmental impacts associated with the other traffic improvements proposed along the Clark Road/Route 3 corridor include alteration of 104.6 acres of land, including 30.8 acres of undeveloped land, and creation of 6.8 acres of new impervious surfaces.

Potential impacts associated with the utility corridor include 11.6 acres of land alteration, creation of 1 acre of new impervious surfaces and work within wetland resources and rare species habitat.

Measures to avoid, minimize and mitigate project impacts presented in the Expanded Environmental Notification Form (Expanded ENF) include: redevelopment of an existing site; certification at the Silver Level under the Core and Shell category for campus development by the US Green Building Council's Leadership in Energy and Environmental Design (LEED); installation of a 500 kw solar PV system; installation of solar hot water systems; water conservation measures; avoidance of wetland impacts; use of pervious pavement, green roofs and rainwater reuse (for irrigation and greywater); compliance with the Wetlands Protection Act Stormwater Management Standards; roadway and signal improvements; development of a Transportation Demand Management (TDM) program including operation of a fixed shuttle system and pedestrian, bicycle and traffic calming improvements; and measures to minimize construction period impacts. In addition, utility corridor alternatives minimize land alteration through location within existing roadways or previously disturbed areas. The utility corridor will

also include construction of a water reuse line from the Camelot Drive WWTP to facilitate reuse of wastewater by the Town for irrigation of Forges Field, the school complex and Crosswinds.

Permits and Jurisdiction

The project is undergoing MEPA review and is subject to preparation of a mandatory Environmental Impact Report (EIR) pursuant to 301 CMR 11.03(1)(a)(1), 11.03(1)(a)(2), 11.03(6)(a)(6) and 11.03(6)(a)(7) because it requires a state permit and consists of alteration of more than 50 acres of land, creation of ten or more acres of impervious area, generation of 3,000 or more new adt on roadways providing access to a single location and construction of 1,000 or more new parking spaces at a single location. The project requires a Construction and Access Permit from the Massachusetts Highway Department (MassHighway) and a Sewer Connection/Extension Permit from the Department of Environmental Protection (MassDEP). It may require a New Source Approval (for on-site water supply alternative), Water Management Act Permit (for on-site water supply alternative), Groundwater Discharge Permit (for ground source heat pump) and various air quality permits (for fuel burning equipment and and/or production of pyrotechnic special effects) from MassDEP. The project may require review by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP) and will require review by the Massachusetts Historical Commission. Also, the project requires an Order of Conditions from the Plymouth Conservation Commission (and a Superseding Order of Conditions in the event the local Order is appealed). The project may receive state funds through the Infrastructure, Investment and Incentive program (I-Cubed) for the transportation and utility infrastructure components of the project.[1] In addition, the project requires a National Pollutant Discharge Elimination System (NPDES) Construction General Permit for Stormwater.

Because the project may include financial assistance from the Commonwealth, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment as defined in the MEPA regulations. These include land alteration, greenhouse gases, traffic/transportation, air quality, water supply, wastewater, open space, wetlands/drainage, rare species and construction period impacts.

Phase 1 Waiver Request

The proponent has requested a Phase 1 Waiver that will allow the proponent to proceed with Phase 1 of the project prior to preparing an EIR for the entire project. Based on a review of the Expanded ENF and comment letters received, and after consultation with state agencies, I propose to grant the Phase I Waiver for this project. This decision is detailed in the DROD which will be published in the next issue of the Environmental Monitor on January 21, 2009 and will be subject to a fourteen-day comment period, after which I shall reconsider, modify or confirm the waiver.

[1] The proponent and the Town of Plymouth intend to jointly submit an Economic Development Proposal for these funds.

Single EIR Request

In accordance with Section 11.05(7) of the MEPA regulations, the proponent has submitted an Expanded ENF with a request that I allow the proponent to fulfill its EIR obligations under MEPA with a Single EIR, rather than the usual process of a Draft and Final EIR. The Expanded ENF received an extended comment period pursuant to Section 11.06(8) of the MEPA regulations. In addition, the proponent submitted a supplemental traffic analysis and extended the comment period by 16 days to provide additional time for its review. The MEPA regulations indicate that I may allow a Single EIR provided that I find that the Expanded ENF:

- describes and analyzes all aspects of the project and all feasible alternatives, regardless of any jurisdictional or other limitation that may apply to the Scope;

- provides a detailed baseline in relation to which potential environmental impacts and mitigation measures can be assessed; and

- demonstrates that the planning and design of the Project use all feasible means to avoid potential environmental impacts.

Review of the Expanded ENF

The Expanded ENF includes a detailed project description supported by project plans; a detailed description of the site and baseline environmental conditions; an alternatives analysis; identification and analysis of potential environmental impacts; and commitments to avoid, minimize and mitigate all potential impacts associated with the project.

Alternatives Analysis

The Expanded ENF includes an alternatives analysis that identifies a no-build alternative, redevelopment of the site as a 102-lot subdivision with continued operation of a golf course, the preferred alternative, five alternative site layout designs and two alternative access plans (which are developed into 10 alternatives in the traffic study) including use of Long Pond Road and direct access to the site from Route 3. In addition, it analyzes four alternatives for water supply and two alternatives for wastewater management.

The alternative site layout designs include: Preferred Alternative (location of studios at the lowest topographical point of the site with landscaping and earthern berms to minimize visual impacts from Long Pond Road, studio amenities located closer to Route 3 and research/educational facilities at the site entrance); Layout Alternative #1 (siting of the studio facilities along Route 3 to minimize visual impacts to residences on Long Pond Road with studio amenities and education/research located closer to Long Pond Road); Layout Alternative #2 (consolidated development footprint and maximization of open space with studios located in the center of the site and studio amenities and education/research facilities located closer to Long Pond Road); Layout Alternative #3 (consolidated development footprint and maximization of

open space with studios located in the center of the site, studio amenities located in the northern area of the site and education/research facilities located at the entrance); and Layout Alternative #4 (a variation on Alternative #3). Criteria used in selection of the alternatives included the ability to meet the programming objectives of the proponent, preservation of open space, protection of wetland resource areas and wellhead protection areas and provision of a buffer between project elements and the residences on Long Pond Road and the South School Educational Complex.

The Expanded ENF indicates that the preferred alternative was selected for its ability to meet the programming objectives of the proponent, to provide strong connections between the studios and the studio amenities, to provide a buffer between the studios and residences on Long Pond Road and to avoid alterations and provide adequate buffers to resource areas. The Expanded ENF indicates that the preferred alternative will create 53 acres of additional impervious area for a total of 65 acres, will alter 38.6 acres of natural forested areas and will restore approximately 34.9 acres of previously disturbed natural areas. Resource agency comments do not identify any concerns with the preferred alternative for the site layout or request additional analysis of alternatives. Comments from the Old Colony Planning Council (OCPC) identify the consistency of the proposed project with its regional plan. In addition, comments from others are supportive of the overall project and do not request additional review of site layout alternatives. Commentors do request that the proponent consider design changes and provide significant input on transportation, water supply and wastewater alternatives which will be addressed in subsequent sections of this Certificate.

Sustainable Design and Greenhouse Gas Emissions

The Expanded ENF indicates that a major objective of the project is to serve as an example of progressive design that integrates innovative, practical and proven architectural and engineering methods to both conserve energy and to reduce the emission of greenhouse gasses. The Expanded ENF identifies how the project has been designed to achieve LEED Certification at the Silver Level and to comply with the MEPA Greenhouse Gas Emissions Policy and Protocol. The analysis reflects the proponent's commitment; it is detailed, thorough and reflects consideration of a wide range of aggressive measures to reduce GHG emissions, from high-performing building envelopes to renewable energy elements.

As required, the Expanded ENF includes an analysis of the greenhouse gas (GHG) emissions associated with the project using the EQUEST model to estimate carbon dioxide (CO_2) emissions from direct and indirect stationary sources and a mesoscale analysis using U.S. EPA's MOBILE 6.2 program to estimate CO_2 emissions from transportation. It identifies measures to reduce GHG emissions and models CO_2 emissions associated with the Base Case (Case 1) and the Preferred Alternative (Case 2). The Preferred Alternative includes: installation of a 500 kilowatt (kw) solar photovoltaic (PV) array on studios 1 and 2; solar hot water for the commissary, hotel and spa, apartments and retail; enhanced building envelope design; high-efficiency HVAC equipment; reduced area lighting; and use of highly efficient equipment (e.g. 93% efficient boilers). It also includes emissions reductions associated with the roadway and signal improvements and the TDM program. As required, the analysis includes discussion of an alternative with greater GHG reductions than the Preferred Alternative (Case 3) including

additional on-site renewable energy resources (e.g. cogeneration and additional solar photovoltaic arrays) and extension of the Plymouth Area Link (PAL) bus service to the site. It includes an exhaustive list of measures that are being considered for inclusion in the project. Because the proponent is evaluating the feasibility and effectiveness of additional renewable energy measures with significant potential to reduce CO_2 emissions, the analysis does not model CO_2 emissions associated with Case 3.

The analysis indicates that the Preferred Alternative will reduce stationary source CO_2 emissions by approximately 20.4%[2] and transportation CO_2 emissions by 4%. Comments from MassDEP and the Division of Energy Resources (DOER) underscore the proponent's commendable commitment to a sustainable design, identify its consistency with the GHG Policy and Protocol and provide detailed comments on the analysis and measures the proponent should analyze in the Single EIR.

Traffic/Transportation

The Expanded ENF describes how access will be provided to the site, includes a traffic study and identifies mitigation measures. Primary access to the site is proposed via a new access road extending from Clark Road to the project site. The access road will include extensions to the South School Educational Complex and to Forges Field. In addition, a multi-use path will be constructed within the same corridor as the roadway. Secondary access is proposed from Long Pond Road via the existing Waverly Oaks Drive and will be used for access to the single family homes and limited access to the studios (up to 500 vehicles per day). Access to the movie studios will be controlled by fencing and staffed gates. The project will include construction of 3,948 new parking spaces for a total of 4,190 spaces. Approximately 1,530 spaces will be located within parking garages and 2,660 spaces will be located in surface lots.

Other roadway improvements include: construction of a modern roundabout at the Clark Road/Long Pond Road intersection; completion of the Route 3/Exit 3 interchange; signalization of the access road/Clark Road intersection; and widening of Clark Road between the Route 3 southbound ramps and Long Pond Road. The construction of the roundabout is a mitigation commitment associated with the River Run project (EEA #13580). Completion of the Route 3/Exit 3 interchange requires a transfer of land owned by The Pinehills (EEA #11519) which The Pinehills is required to provide consistent with its mitigation commitments.

The Expanded ENF indicates that the project will include on-site and off-site improvements to pedestrian and bicycle access including links to existing and proposed bicycle routes.

The traffic study generally conforms to EEA/Executive Office of Transportation and Public Works (EOTPW) Guidelines for EIR/EIS Traffic Impact Assessment. It clearly describes the methodologies used to develop the information and provides supporting documentation. The study identifies trip generation, analyzes impacts and provides a level-of-service (LOS) analysis. It indicates that the project will generate a total of 9,916 adt based on empirical trip generation

[2] This estimate does not include emissions associated with tenant equipment which is the single largest source of CO2 emissions associated with the project.

data obtained from Paramount Studios in California for the studio components of the project and Institute of Traffic Engineers (ITE) Land Use Codes for the remainder of the project components.

The study area includes Clark Road, Long Pond Road and Route 3 including seven major intersections and four ramp junctions. The traffic analysis evaluates ten alternatives based on the ability to minimize project-related impacts along Long Pond Road, maintain the rural character of the Clark Road/Long Pond Road corridors and ensure that the state highway system will continue to function in a safe and efficient manner with sufficient reserve capacity to accommodate future traffic growth. These alternatives include:

Alternative 1: Clark Road Access with a Full Interchange Improvement;
Alternative 1A: Clark Road Access with a Full Interchange Improvement and Long Pond Road Buffer;
Alternative 1B: Clark Road Access with Interchange Improvement and Northbound Slip-Ramp;
Alternative 1C: Clark Road Access with Route 3 Southbound Interchange Improvement;
Alternative 2: Clark Road Access with Partial Interchange Improvement;
Alternative 3: Clark Road Access with Route 3 Southbound Off-Ramp Connector;
Alternative 4: Clark Road/Long Pond Road Realignment;
Alternative 5: Route 3 Southbound Interchange;
Alternative 6: Route 3 Southbound Off-Ramp; and
Alternative 7: Clark Road Access with Full Interchange Improvement and Realignment of Long Pond Road.

Alternative 1A is identified as the preferred alternative from a traffic operations perspective. In addition, it will provide a buffer between the Long Pond Road neighborhood and the proposed roundabout. Under the 2018 Build with Mitigation scenario, it will provide overall operating conditions of LOS B or better during the peak periods along the Clark Road corridor. All movements at the access road intersection will operate at LOS C or better. The ramp junctions with Route 3 will operate at LOS D or better.

The majority of comment letters received on the project address traffic and access issues. Comments from MassHighway indicate that the traffic analysis should be revised to extend the horizon year to 2028 and to refine the trip generation methodology. In addition, MassHighway indicates that the Single EIR should include evaluation of an additional alternative consisting of slip ramps in the northeast and southwest quadrant. Many commentors are supportive of the Preferred Alternative including the Town of Plymouth, the Plymouth School Superintendent, the Old Colony Planning Council and many residents. In addition, the OCPC comment letter includes recommendations for implementation of the traffic monitoring plan. Comments from the Plymouth School Superintendent indicate that the School Department is committed to redesigning its traffic patterns to minimize access to Long Pond Road. Several residents suggest that additional review of alternatives that provide direct access to the site from Route 3 is warranted in order to assess the project's ability to provide visibility and direct access to the site, to provide access to Town facilities and the Myles Standish State Forest and to avoid alteration

of conservation land. Other comments identify additional issues that should be addressed in the Single EIR including provision of transit service and bicycle and pedestrian access.

Air Quality

In accordance with the State Implementation Plan (SIP) for ozone attainment, the proponent conducted a mesoscale air quality analysis for volatile organic compounds (VOCs) and oxides of nitrogen (NO_x). The results indicate that VOCs and NO_x emissions will increase by 2.8 and 4.0 tons per year (tpy) respectively under the 2018 Build scenario compared to the 2018 No Build Scenario. Because hydrocarbon emissions are greater than the No Build scenario, the proponent is required to provide appropriate mitigation including the development of a TDM program. The Expanded ENF describes associated mitigation including roadway and signal improvements and development of a TDM program that includes the following: identification of an on-site transportation coordinator, encouragement of flex-time and telecommuting, operation of a fixed route shuttle system linking the project to other attractions in Plymouth, provision of transit subsidies, provision of information regarding public transportation, designation of parking spaces for car/vanpools, electric vehicle charging stations, accommodation of car-sharing services and support for bicycle commuting. In addition, the project will include pedestrian, bicycle and traffic calming improvements. The mesoscale analysis shows a slight increase in VOC and NO_x emissions of 0.1 and 0.2 tpy respectively from the 2018 Build Scenario to the 2018 Build with Mitigation Scenario. The analysis indicates that, although the improvements will address congestion during the peak periods, the length of the ramps may be contributing to the increases. The project will include a traffic monitoring and reporting program that will identify actual trip generation and patterns associated with the project and support analysis of the effectiveness of mitigation measures.

Although the TDM program proposes measures that should be effective in reducing project related emissions, MassDEP comments indicate that additional measures should be considered to address the increase in emissions from the 2018 Build to 2018 Build with Mitigation scenario.

Water Supply

The Expanded ENF indicates that the existing potable and irrigation wells at Waverly Oaks will be abandoned. Water supply alternatives presented in the Expanded ENF include connecting to the Town's public water supply (PWS) within the Bradford Service Zone (Alternative 1), replacing the existing irrigation wells with a PWS well (Alternative 2), connecting to and upgrading the Town of Plymouth wells servicing the South School Educational Complex (Alternative 3), and developing a new well on the conservation land located to the south of the South School Educational Complex (Alternative 4). The alternatives analysis for water supply assesses each alternative for its ability to meet water demands, to provide a stable water supply with redundancies, to provide adequate pressure, to service additional properties through the PWS system including the schools complex, for consistency with permitting requirements and for permitting timelines.

Construction of an on-site well would require the proponent to register as a PWS. It would include construction of a new well, a building to house the pumping and monitoring

equipment, chemical storage and feed facilities and a 500,000 gallon water tower for pressure stabilization. This alternative requires a WMA permit and New Source Approval by Mass DEP. The proponent has filed applications with MassDEP for a WMA permit and for approval to site and conduct a pumping test. The WMA application requests a daily average water withdrawal of 0.171 million gallons per day (MGD), for an annual withdrawal of 62.45 million gallons per year (MGY), through 2019. In 2020, the requested withdrawal would increase to an average daily volume of 0.174 MGD, for an annual withdrawal of 63.5 MGY. The Expanded ENF summarizes results of the groundwater modeling previously conducted by the Unites States Geological Survey (USGS) groundwater flow model and includes plans identifying the associated Zone I and Zone II (estimated) wellhead protection areas. Water withdrawn from the well will be contributed from the aquifer underlying the Zone II area which is recharged through precipitation. The Expanded ENF asserts that drawdowns will be very slight because of the high hydraulic conductivity of aquifer materials and that wells outside of the 400-foot radius should experience little or no drawdown from pumping of the production well. In addition, it notes that previous testing indicated good water quality.

The Expanded ENF identifies the Town of Plymouth's Water Management Act (WMA) authorization as 6.36 million gallons per day (MGD). It indicates that the average day demand is 4.91 MGD and maximum day demand, between 1990 and 2004, was between 6.09 MGD and 10.55 MGD. Selection of a municipal supply alternative would require a Mass DEP permit (Distribution Modification for Systems that serve more than 3,300 people). Based on the analysis included in the Expanded ENF, Alternative 1 and Alternative 4 appear to be the most feasible municipal supply alternatives.

Proposed measures to reduce water use include use of ultra-low flow fixtures, waterless urinals, dual flush toilets and re-use of rainwater for irrigation and greywater (for flushing and cooling tower water make-up). MassDEP provided extensive comments regarding water supply including a request for additional analysis of impacts to the Town PWS and the identification of permitting requirements. Comments from the Eel River Watershed Association indicate concern with the proposed water withdrawal and impacts to the baseflow of the Eel River.

Wastewater

The project will generate approximately 166,000 gpd of wastewater. The Expanded ENF includes analysis of wastewater treatment alternatives including conveyance of wastewater from the site to the Camelot Drive wastewater treatment plant (WWTP) via a new sewer extension (Preferred Alternative), construction of an on-site wastewater treatment plant (Alternative 1) and upgrades to the South School Educational Complex WWTP. The proponent indicates that the Preferred Alternative was selected based on public benefit, construction costs and minimization of environmental impacts. The Expanded ENF indicates that the existing capacity of the Camelot Street WWTP is 2.5 million gpd and current flows are approximately 2 million gpd. The project will include construction of a grit screening facility at the WWTP. The extension will also serve the South School Educational Complex. In addition, the proponent proposes to install a water reuse line to facilitate reuse of wastewater as irrigation for Forges Field, for the schools and Crosswinds.

The Expanded ENF identifies three potential alignments for the sewer extension including: cross country route to Jordan Road and Russell Mills Road (Proposed Alignment), Long Pond Road/Jordan Road (Alternative 1) and Long Pond Road to Camelot Drive (Alternative 2). Analysis of these alternatives includes consideration of sewer capacity, environmental impacts, ability to provide additional connections for adjoining property owners and replace Title 5 systems, community impacts including construction impacts, construction costs and construction timelines. The Proposed Alignment was selected based on costs, environmental impacts and ease of construction.

MassDEP comments request additional analysis of the sewer alignment based on each alignment's potential to provide additional connections and reduce nitrogen contributions through removal of septic systems. In addition, MassDEP comments identify permitting requirements associated with the wastewater infrastructure. Comments from the Eel River Watershed Association note that all withdrawal and wastewater discharge will contribute to the Eel River watershed. These comments request that the proponent further consider an on-site wastewater treatment system.

Open Space/Recreation

The Preferred Alternative includes land alteration within the conservation land located between Clark Road and the South School Educational Complex and the creation of 6.3 acres of impervious surfaces. The conservation restriction includes allowances for construction of an access road to adjacent properties and its ownership will not change; therefore, the project is not considered a change in use. Some of the roadway improvement alternatives may result in additional alteration to conservation land located on the southwestern side of the Clark Road/Route 3 corridor. The Expanded ENF does not identify the amount of alteration or describe resources that could be affected by these changes.

The project is located in close proximity to the Myles Standish State Forest which is owned and operated by the Department of Conservation and Recreation (DCR). The Expanded ENF does not assess potential impacts to the park from the project and associated traffic. Comments from DCR and the Friends of Myles Standish State Forest identify analysis that should be included in the Single EIR and suggest potential mitigation alternatives.

Wetlands/Drainage

The Expanded ENF identifies wetland resource areas within the project site and associated with the off-site improvements. It identifies measures to avoid, minimize and mitigate impacts to wetland resources including avoidance of wetlands and direct alteration to wetlands and development of a stormwater management plan that incorporated LID techniques. The utility corridor is the only project element proposed within a wetland resource area. It involves a stream crossing within an area that includes Riverfront Area, Bordering Vegetated Wetlands (BVW) (310CMR10.55), Inland Bank (310CMR10.54), Land Under Water (LUW) (310CMR10.56) and Bordering Land Subject to Flooding (BLSF) (310CMR10.57). Comments from MassDEP identify permits required for the proposed work, including an Order of Conditions from the Plymouth Conservation Commission, and applicable standards. Comments

from the Plymouth Conservation Commission do not identify significant concerns with impacts to wetland resource areas nor do other commentors.

Rare Species

The Expanded ENF indicates that the project will have minimal impacts on rare species. The project site, access road and proposed roadway improvements are not located within rare species habitat as identified by NHESP. The proposed utility corridor does extend through Priority Habitat at a location within Forges Field and within within Russell Mill Road. To minimize impacts to rare species and other resources, the utility corridor is located within the roadway ROW at both locations. The Expanded ENF asserts that, because the project activities consist of construction within a paved roadway, it is exempt from review under the Massachusetts Endangered Species Act (MESA). Comments from NHESP confirm elements of the project are proposed within *Priority Habitat* and that the proposed work may be exempt from review. In addition, NHESP comments indicate that work associated with upgrades at the Bradford Well Treatment Plant may be subject to its review.

Historic/Cultural Resources

The Expanded ENF indicates that the project site, proposed access road and proposed utility corridor do not contain any historic or archaeological resources that are listed on the State and National Registers of Historic Places or the Inventory of the Historic and Archaeological Assets of the Commonwealth. Some pre-historic archaeological sites are located in the vicinity of, but not within, the proposed access road and other areas where transportation improvements are proposed. In addition, several pre-historic archaeological sites and historic archaeological sites are located in the immediate vicinity of the proposed utility corridor. A Project Notification Form (PNF) and, subsequently, existing and proposed project plans were submitted to the Massachusetts Historical Commission (MHC). MHC requested that the proponent conduct an intensive (locational) archaeological survey for a limited area consisting of the undisturbed portions of the cross-country utility corridor and access road right-of-way (ROW). Comments from MHC indicate that the Expanded ENF provides an accurate summary of consultation with MHC and requests that, if significant historic or archaeological resources are identified, the proponent consider alternative alignments to avoid impacts to identified resources.

Construction Period Impacts

The Expanded ENF identifies construction phasing (based on development zones and off-site work), construction period impacts and identifies measures to avoid, minimize and mitigate impacts. It indicates that construction of the access road is proposed as Phase 1 and traffic management plans will be developed to minimize the impacts associated with construction period traffic. Separate traffic management plans will be prepared for the utility corridor work. Initial site grading will include construction of the earthern berms around the studios site to minimize noise impacts by providing a buffer between the site and residences on Long Pond Road. If materials cannot be removed for reuse or needs to be broken up for removal, a hydraulic impact hammer will be used. Only if that is not effective will blasting be conducted. If blasting is required, the proponent will use blasting agents that do not contain percholorate. The Expanded ENF notes that blasting activities are regulated by the State Fire Marshal's Office

and will be conducted in accordance with regulatory standards and that blasting activities within 250 feet of a state highway must be coordinated with MassHighway. The proponent has committed to use low-sulfur diesel fuel to reduce diesel exhaust fumes and particulate emissions associated with construction equipment. Street sweeping and water will be used to minimize dust generated from earthwork and other construction activities.

Conclusion

Comments from state agencies do not identify any concerns associated with preparation of a Single EIR and many commentors express overall support for the project as well as efforts to facilitate it; however, some commentors express concern that issues identified in the Expanded ENF cannot be addressed adequately through a Single EIR. Based on a review of the Expanded ENF and after consultation with state agencies, I am satisfied that the Expanded ENF meets the regulatory requirements and I am hereby permitting the proponent to file a Single EIR in fulfillment of Section 11.03 of the MEPA regulations. The following Scope identifies the issues that should be addressed in the Single EIR.

Scope

Project Description

The Single EIR should include a thorough description of the entire project and all project elements and construction phases. The Single EIR should include an existing conditions plan illustrating resources and abutting land uses (including water supply zones) for the entire project area and a proposed conditions plan (or plans) illustrating proposed elevations, structures, access roads, stormwater management systems, and sewage connections. The Single EIR should also include a site circulation plan illustrating how motor vehicles, pedestrians and cyclists will be accommodated on the site and identify pedestrian and bicycle connections to adjacent sites and/or recreational trails. Plans must be provided for the entire site at a reasonable scale.

Alternatives Analysis/Land Alteration

As noted previously, based on a review of the comment letters there appears to be support for the site layout associated with the Preferred Alternative. In addition, this alternative will not alter resource areas and provides adequate buffers to resource areas. The Preferred Alternative will create an additional 53 acres of impervious surfaces and includes alteration of 38.6 acres of undisturbed natural areas. The proponent proposes to mitigate associated impacts through design of an effective stormwater management system, including use of Low Impact Development (LID) techniques such as use of pervious pavement and structured parking and restoration of 34.9 acres of previously disturbed natural areas. The proponent is not required to further analyze alternative site layouts in the Single EIR. The proponent should consider additional mitigation to minimize land alteration and creation of impervious surfaces and to minimize impacts associated with the preferred alternative. In particular, the proponent should consider refinements to its design that can further minimize alterations to undisturbed natural areas. The Single EIR should

identify total land alteration, including grading, associated with on-site and off-site project elements.

Greenhouse Gas Emissions

As noted previously, the proponent has proposed significant investments in renewable energy and other GHG emission reduction measures consistent with its emphasis on designing a sustainable site and green buildings. At the same time, energy demand associated with the studio is much higher than a traditional office building or housing development. To offset a significant portion of its GHG emissions the proponent will need to develop additional mitigation measures.

The Single EIR should include a revised GHG analysis including modeling of Case 3 that incorporates significant additional measures to increase energy efficiency and produce renewable energy. In particular, the proponent must evaluate how it can reduce energy associated with tenant equipment which is the largest single source of GHG emissions associated with the project. The Single EIR should identify measures the proponent will commit to for reducing tenant energy use which may range from requirements included in leases/contracts to encouragement of good practices. The analysis, estimated reductions and percentage reductions should include all GHG emission sources including energy associated with tenant equipment. In addition, Case 1 (code-compliant case) should be based on the revised energy code which adopts and integrates the IECC 2006 with 2007 supplement. As the analysis is revised, the proponent should consider recommendations included in the MassDEP/DOER comment letter. I strongly encourage the proponent to consult with the MassDEP, DOER and the MEPA Office regarding the revised analysis prior to filing the Single EIR.

Traffic/Transportation

The Single EIR should include a revised traffic analysis that responds to MassHighway comments. At a minimum, the Single EIR should include additional analysis of Alternative 1A, Alternative 1B and an alternative that includes slip ramps in the northeast and southwest quadrant of the Route 3/Exit 3 corridor. I strongly encourage the proponent to continue its consultations with MassHighway, OCPC, the Town of Plymouth and its residents to develop consensus around preferred roadway improvements prior to filing the Single EIR. In addition, the proponent should consult with the Town and residents regarding whether additional analysis of Alternatives 1C, 2, 4 or 7 is warranted and, if so, those alternatives should be carried forward into the Single EIR.

The Single EIR should identify relevant design standards for roadway improvements (local, state and federal) and identify all associated impacts including land alteration, creation of impervious surfaces and impacts to environmental resources. It should describe how stormwater will be managed. The Single EIR should address recommended and proposed improvements along Long Pond Road and at the Long Pond Road/Jordan Road intersection in more detail and provide design plans. In particular, it should address how such improvements could benefit the entrance to the Myles Standish State Forest and address any potential impacts to the park.

Comments from The Pinehills identify alternatives 1B and 1C as consistent with its planning goals and indicate that it will transfer the land required in the southeast quadrant for a full loop ramp and is prepared to transfer a portion of land in the northeast quadrant for construction of a slip ramp. The letter also expresses concern regarding the impact of a loop ramp in the northeast quadrant because of the extent of required land takings and impacts on planned development and express opposition to an interchange on Route 3 which would provide a direct connection to the project site because of its impact on the forested buffer located on the eastern side of Route 3.

The Single EIR should identify the parking ratios associated with each aspect of the project, explain how the number of parking spaces was determined and describe how shared parking has been incorporated into the project. The Single EIR should demonstrate that the parking supply is the minimum necessary to accommodate project demand.

Air Quality/Transportation Demand Management (TDM)

Comments from MassDEP request revisions to the mesoscale analysis and recommend the development of additional TDM measures to offset increases in NOx and VOCs associated with traffic increases and roadway improvements. Comments from MassHighway, MassDEP, OCPC and Walk Boston include numerous recommendations to encourage transit use, walking and bicycling. The proponent should consider these recommendations as it further develops the TDM program. The Single EIR should include a strengthened TDM Program, clearly identify and describe all on-site and off-site measures to promote non-vehicular access to the site, to promote bicycle and pedestrian safety and to create connections between the proposed multi-use trail and existing and/or planned trails in the vicinity of the project site. Many commentors, including the Town and The Pinehills, have requested that the roadway improvements along the Clark Road/Route 3 corridor incorporate safe pedestrian and bicycle access. This should be a priority.

The proponent should consult with the Greater Attleboro Taunton Regional Transit Authority (GATRA) to ensure the site design and roadways support safe and accessible transit service and to discuss provision of operating subsidies to provide transit access to the site.

In addition, MassDEP comments indicate that the project may require air quality permits associated with fuel burning equipment. Pyrotechnics and other special effects may require a Plan Approval under 310 CMR 7.02. The proponent should consult the relevant regulations identified in the MassDEP comment letter, identify any required air quality permits and describe how the project is consistent with regulatory standards and requirements.

Water Supply

The Single EIR should provide further analysis of Alternatives 1, 2 and 4 based on comments received on water supply. The Single EIR should identify how each alternative will be developed consistent with regulatory standards and requirements. For the on-site alternative, the Single EIR should include the results of the pumping test and analysis. It should identify how the proponent will meet requirements for 10% unaccounted-for water and an average day residential use of 65 gallons per capita per day and include a water conservation program and a seasonal demand management plan. MassDEP comments indicate that portions of both of the existing lined ponds would be located within the Zone I wellhead protection area of the on-site well. The Single EIR should indicate whether the well would be relocated or the ponds filled to eliminate the potential for groundwater to be contaminated by the surface water or identify how the project will be developed consistent with the Surface Water Treatment Rule. I note that connection to the Town PWS would eliminate this issue and allow the existing lined ponds to be used for stormwater collection and irrigation. Also, MassDEP comments recommend that the project provide interconnections with other PWS systems to avoid disruptions in water supply and protect public health and safety. The Single EIR should address how the proponent will address any potential disruption of its supply.

The Single EIR should include additional discussion regarding the impact of the Plymouth Rock Studios demand on the Plymouth system as a whole and on the Bradford Park Zone in particular. This discussion should take into account any planned projects and associated water withdrawal within the Town. The Single EIR should address discrepancies between the information in the Expanded ENF regarding the maximum day demand and projected demand and re-assess projections.

For all alternatives, the Single EIR should include an estimate of water demand associated with irrigation. In addition, the Single EIR should provide an estimate of reduced water demand based on proposed water conservation measures and may choose to include the GHG benefits associated with reduced water consumption within its revised GHG analysis.

Wastewater

MassDEP comments indicate that the Plymouth Harbor estuary is listed as an impaired waterbody due to excessive nutrients (likely nitrogen) and indicates that this project is likely to increase the nutrient load in this estuary by adding increased flow to the Plymouth WWTP. The preferred alternative avoids densely populated roadways many of which are located in the watershed that contributes to the estuary. However, MassDEP's comments suggest that, if the sewer main were located in these roadways and the adjacent homes connected, a net reduction of nutrients entering the estuary could occur due to the reduction in the number of onsite septic systems. Furthermore, these roadways could be reconfigured as necessary to improve safety and be designed to more efficiently address stormwater. The Single EIR should carry forward each sewer extension alignment alternative presented in the Expanded ENF for additional review and evaluate each for the potential to tie-in adjacent onsite septic systems. The Single EIR should also address potential secondary growth issues associated with each alternative and identify

growth management measures that could be instituted by zoning or other directly applicable requirements to mitigate growth impacts. I note that the connection of this project to the municipal system was not contemplated in the approved Plymouth Comprehensive Wastewater Management Plan (CWMP) (EEA #8228). The Town of Plymouth should file a Notice of Project Change (NPC) for the CWMP in conjunction with the Single EIR to facilitate coordinated review of the projects.

MassDEP comments indicate that wastewater generated during the production of movies is defined as industrial wastewater which may require pretreatment and/or flow equalization before it can be discharged for treatment at the Plymouth WWTP. The Single EIR should discuss the types and volumes of industrial wastewater that will be generated by the project. This analysis should identify how this wastewater will be captured, treated and stored.

Regulations that regulate and permit the reuse of treated wastewater (314 CMR 20.00) will be promulgated prior to the construction of this project. MassDEP comments indicate that the proposed wastewater reuse pipeline should be designed and constructed consistent with these regulations. MassDEP will consider the pipeline as a modification to the effluent structure of the wastewater treatment facility which will require the Town to submit a permit application. The proponent should consult with MassDEP and the Town regarding development of the permit application.

In addition, the Groundwater Discharge Permit regulations (314 CMR 5.00) are undergoing revision and will be promulgated in the near future. If a geothermal heat pump is included as a component of the project's GHG mitigation, the proponent should review the draft and/or final regulations prior to submitting the Single EIR and consult with MassDEP to determine whether it will require a Groundwater Discharge Permit. If a permit is required, the Single EIR should identify the project's consistency with the regulations.

Open Space/Recreation

The Single EIR should identify all impacts to open space, including those associated with the access roadway and other transportation improvements. All conservation land and open space resources within the vicinity of the project site should be described and identified on a project plan, including the Myles Standish State Forest. The proponent should consult with DCR prior to the filing of the Single EIR regarding concerns identified in its comment letter and regarding the revised traffic analysis which should also assess traffic impacts to Myles Standish and provide an assessment of traffic traveling from the west to the project site which may use parkways as a cut-through.

The Single EIR should identify mitigation for open space impacts including consideration of participation in land acquisition efforts within the vicinity of the project site and measures to minimize impacts to the Myles Standish State Forest.

Wetlands/Drainage

The local conservation commission will review the project for consistency with the Wetlands Protection Act and associated Stormwater Management Standards. The utility corridor may require a 401 Water Quality Certificate and/or a Chapter 91 License. The proponent should consult with MassDEP to identify permitting requirements and address these in the Single EIR.

The Single EIR should include plans for the utility corridor that illustrate most recently approved delineation of all applicable resource area boundaries including riverfront areas, buffer zones, 100-year flood elevations, priority and/or estimated habitat, wetland replication areas, and waterways associated with the utility corridor.

MassDEP comments note that new statewide stormwater regulations are being promulgated (314 CMR 21.00) which will require new projects with larger impervious areas to meet specific statewide stormwater management requirements. These new rules are anticipated to take effect in the first half of 2009 and, pursuant to proposed Transition rules, will apply to all projects that have not commenced 6 months after the proposed general permit is issued. MassDEP recommends that all projects such as this one that will result in 5 acres or more of impervious area (including roofs) and that are scheduled to commence on or after October 1, 2009 be designed consistent with the revised stormwater regulations and associated performance standards. The Single EIR should include a stormwater management plan that demonstrates compliance with these standards.

Rare Species

As noted previously, the project may be exempt from MESA review. The proponent should consult with NHESP prior to filing the Single EIR to confirm whether proposed activities will be exempt. If MESA review is required, the Single EIR should identify which project elements will require review, identify how the project will be conducted consistent with regulatory standards and requirements including the identification of additional mitigation.

Construction Period Impacts

The project has potentially significant construction impacts, including extensive earth moving and potential blasting. The Expanded ENF identifies measures to minimize construction period impacts. The Single EIR should address comments related to construction period impacts (on- and off-site) and mitigation for construction period impacts should be incorporated into the Project's draft Section 61 Findings. Additional information should be provided on blasting, including the extent of blasting and potential locations for blasting.

The proponent should consider expansion of its air quality mitigation to include installation of after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs) to reduce air emissions and consider use of ultra low sulfur diesel (ULSD) fuel rather that low sulfur diesel fuel.

Mitigation

The Single EIR should include a separate chapter on mitigation measures. It should include a Draft Section 61 Finding for all required state permits that includes a clear commitment to mitigation, an estimate of the individual costs of the proposed mitigation, and the identification of the parties responsible for implementing the mitigation. A schedule for the implementation of mitigation, based on the construction phases of the project, should also be included.

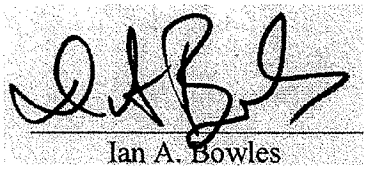
Response to Comments

The Single EIR should contain a copy of this Certificate and a copy of each comment received. The Single EIR should respond to the comments received to the extent that the comments are within MEPA jurisdiction. This directive is not intended to and shall not be construed to enlarge the scope of the Single EIR beyond what has been expressly identified in this certificate. I recommend that the proponent use either an indexed response to comments format, or else direct narrative response. The Single EIR should present any additional narrative or analysis necessary to respond to the comments received.

Circulation

The Single EIR should be circulated in compliance with Section 11.16 of the MEPA regulations and copies should be sent to any state agencies from which the proponent will seek permits or approvals, to the list of "comments received" below, and to Plymouth officials. A copy of the Single EIR should be made available for review at the Plymouth public library.

January 16, 2009
Date



Ian A. Bowles

Comments Received:

1/9/09	Department of Conservation and Recreation (DCR)
12/23/08	Division of Fisheries and Wildlife/Natural Heritage and Endangered Species Program (NHESP)
1/9/09	Executive Office of Transportation and Public Works (EOTPW)
12/3/08	Massachusetts Historical Commission
12/1/08	Therese Murray, Senate President

12/9/08	Thomas J. Calter, State Representative
12/2/08	Vinny deMacedo, State Representative
1/8/09	Plymouth Public Schools/Superintendent of Schools
12/29/08	Town of Plymouth/Conservation Commission
1/6/09	Town of Plymouth/Board of Selectmen
12/17/08	Town of Plymouth/Planning Board
12/18/08	Destination Plymouth
1/9/09	Eel River Watershed Association, Ltd.
1/8/09	Friends of Myles Standish State Forest
12/15/08	Greater Attleboro Taunton Regional Transit Authority (GATRA)
1/2/09	Old Colony Planning Council
12/19/08	Plymouth 1000
1/7/09	The Pinehills
1/3/09	Walk Boston
1/8/09	Wildlands Trust of Southeastern MA
1/7/09	William S. Abbott, P.C.
1/9/09	John Adelmann
1/8/09	Patricia N. Adelmann
1/5/09	Aileen Sanger Chase
12/30/08	James Concannon
1/8/09	James Concannon (second letter)
12/26/08	Fr. Richard G. Curran, Ed. D.
1/6/09	Joseph J. DeSilva
1/5/09	Oliver H. Durrell III
1/7/09	Betsy Hall
1/3/09	Steven Lydon
1/8/09	Malcolm A. MacGregor
1/7/09	Paul McAlduff
1/6/09	Roger W. Monks
1/5/09	Lois and Douglas Post
1/7/09	Craig Richards
1/8/09	Larry Rosenblum
12/12/08	Richard Silva
12/12/08	Loring Tripp III

IAB/CDB/cdb

MEMORANDUM

TO: Deirdre Buckley, Environmental Reviewer, MEPA Unit

THROUGH: Jonathan Hobill, Acting Deputy Regional Director,
Bureau of Resource Protection
David Johnston, Acting Regional Director
Millie Garcia-Serrano, Deputy Regional Director, BWSC
Laurel Carlson, Acting Deputy Regional Director, BWP
Brenda Chabot, Deputy Regional Director, ADMIN

CC: Elizabeth Kouloheras, Chief, Wetlands
Margo Clerkin, Wetlands Program
Jeffrey Gould, Chief, Water Pollution Control
Richard Rondeau, Chief, Water Supply
Leslie O'Shea, Water Management Act
Richard Keith, Chief, Municipal Services
Pamela Truesdale, Municipal Services
David Burns, Team Leader, South Coastal Watershed
Jan Drake, Team Coordinator, South Coastal Watershed
John Winkler, Chief, Air Quality/Permitting
Gerard Martin, Chief, Site Management
Jennifer Viveiros, Green House Gas Emissions
Susan Lyon, BWP-DPE-APPP
Phil Weinberg, Program Manager, OPS DC
John Bellam, Energy Engineer, DOER

FROM: Sharon Stone, SERO MEPA Coordinator

DATE: January 13, 2009

RE: EENF EOEEA #14345 – PLYMOUTH – Plymouth Rock Studios
444 Long Pond Road

****

"For Use in Intra-Agency Policy Deliberations"

The Southeast Regional Office of the Department of Environmental Protection (MassDEP) has reviewed the Expanded Environmental Notification Form (EENF) for the proposed Plymouth Rock Studios project to be located at 444 Long Pond Road, Plymouth, Massachusetts (EOEEA #14345). The project proponent provides the following information for the project:

"The project consists of the construction of a movie studio complex on the 242-acre site of the Waverly Oaks Golf Club in Plymouth. It will include a Studio Production Campus (including production stages, a back lot, office buildings and a visitor center), a Studio Amenities Campus (including shops, restaurants, a hotel and

housing) and a Research/Education Campus (including research and education buildings). Primary access to the site will be provided by a new access road and recreation path that will connect Clark Road with the project site. Secondary access will be provided via the existing access to Waverly Oaks along Long Pond Road. Wastewater will be conveyed from the site to the Camelot Drive Wastewater Treatment Plant via a new sewer extension. Two alternatives for providing potable water to the site are under consideration. These include connection to the municipal supply or construction of an on-site well.

The site is located between Long Pond Road and Route 3 near Interchange 3. The site abuts Crosswinds Golf Course to the northwest, Forges Field Recreational Complex to the north, Plymouth South High School and Middle School to the south and Route 3 to the east. Residential neighborhoods on Long Pond Road abut the site to the west. Myles Standish State Forest is located just southwest of the site off Long Pond Road. The site consists of a 27-hole golf course, a club house, ancillary support structures, parking lots, access roads, an irrigation system, drinking water wells, lined ponds associated with the irrigation and stormwater management systems, a single family home and 9 housing lots. The site contains three isolated wetland areas.

The project is undergoing MEPA review and is subject to preparation of a mandatory Environmental Impact Report (EIR) pursuant to 301 CMR 11.03 (1)(a)(1), 11.03 (1)(a)(2) and 11.03 (6)(a)(6) because it requires a state permit and consists of alteration of more than 50 acres of land, creation of ten or more acres of impervious area, and generation of 3,000 or more new average daily vehicle trips (adt) on roadways providing access to a single location and construction of 1,000 or more new parking spaces at a single location.

The project requires an Access Permit from the Massachusetts Highway Department (MassHighway) and a Sewer Extension Permit from the Department of Environmental Protection (MassDEP). It may require a New Source Approval, Water Management Act Permit and a Groundwater Discharge Permit from MassDEP. Also, the project requires an Order of Conditions from the Plymouth Conservation Commission (and a Superseding Order of Conditions in the event the local Order is appealed)."

The South Coastal Watershed Team has reviewed the document and indicates the following comments.

Wetlands and Waterways

The Department of Environmental Protection's Southeast Regional Office's Division of Wetlands and Waterways has reviewed the Expanded Environmental Notification Form (EENF) for the Plymouth Rock Studios in Plymouth.

The project requires a filing of a Request for Determination of Applicability or a Notice of Intent with the Plymouth Conservation Commission and the Department. The filing

should provide plans and narratives of sufficient detail to identify all jurisdictional resource areas and their buffer zones and to determine if all impacts that cannot be avoided have been minimized and mitigated.
It appears that only Wetland A is jurisdictional under the Massachusetts Wetland Protection Act (MWPA) and the submitted plans show no proposed activity in that area. If the project proceeds as proposed a Request for Determination may be sufficient.

All of the proposed options for a utility corridor within existing roadways occur outside the property area. The proponent's preferred alternative and alternative number 1 involve a stream crossing at the same location. This area includes Riverfront Area (310CMR10.58), Bordering Vegetated Wetlands (BVW) (310CMR10.55), Inland Bank (310CMR10.54), Land Under Water (LUW) (310CMR10.56) and Bordering Land Subject to Flooding (BLSF) (310CMR10.57). The proponent should consult the U.S. Army Corps of Engineers Programmatic General Permit effective 1/20/05 and the *Massachusetts River and Stream Crossing Standards: Technical Guidelines, 8/6/04.* This project is subject to the new Wetlands Protection Act stormwater regulations, 310 CMR 10.05(6)(b) and (k-q), effective January 2, 2008. Please see Redevelopment Checklist http://mass.gov/dep/water/laws/v2c3.doc found in the new *Stormwater Handbook, 2008.* This portion of the project requires the filing of a Notice of Intent. An Order of Conditions must be received and recorded prior to commencement of the project.

Dependent upon the extent of wetland fill, if any, and /or dredging the project may require a 401Water Quality Certificate from the MassDEP. At the point of stream crossing, if the stream is tidally influenced, the project will also require a Chapter 91 License.

If you have any questions regarding the Wetlands and Waterways comments noted above, please contact Margo Clerkin of the SERO Wetlands Program at (508) 946-2735.

Water Supply
The Water Supply alternatives identified in the EENF are connection to the Town of Plymouth Public Water Supply (PWS) and developing an on-site potable well with Plymouth Rock Studios registering as its own PWS.

Connection to the Town of Plymouth Public Water Supply (PWS) Alternative
The EENF correctly identifies the Town of Plymouth's Water Management Act (WMA) authorization as 6.36 million gallons per day (MGD). The Town's 2007 average day demand was 4.97 MGD and maximum day demand was 8.88 MGD. Plymouth's South Coastal Basin WMA Permit is due to expire on August 31, 2010 (Plymouth also has a WMA Permit in the Buzzards Bay Basin which is due to expire May 31, 2011). Prior to permit renewal, the Department of Conservation and Recreation will be developing new water needs forecasts for all PWSs in the South Coastal Basin, including the Town of Plymouth.

The EIR should contain further discussion regarding the impact of the Plymouth Rock Studios demand on the Plymouth system as a whole and on the Bradford Park Zone in particular, unless, at the time of EIR submittal, it has been decided that the Studios will

develop its own PWS. This discussion should take into account any additional projects proposed in the Town of Plymouth that are currently in planning. The EIR should expand upon the discussion of maximum day demand vs. system capacity. The EENF states that for the period of 1990 through 2004, Plymouth's maximum day demand ranged from 6.09 MDG to 10.55 MGD, and that system capacity is 11.02 MGD. The Town's Water System Master Plan predicts a 2025 maximum day demand of 12.96 MGD, based on a maximum day demand to average day demand ratio of 1.9. The EIR discussion should take into consideration that Plymouth's maximum day demand for 2005 through 2007 has ranged from 8.88 MGD to 9.48 MGD, considerably lower than the high of 10.55 MGD for the 1990 through 2004 time period. In addition, the renewed WMA Permit will contain a schedule for Plymouth to meet the standards of 10% unaccounted-for water and an average day residential use of 65 gallons per capita per day. These factors will affect both average day and maximum day pumping rates. Further, the renewed Permit will require Plymouth to implement a seasonal demand management plan. This factor should reduce the maximum day demand to average day demand ratio. Finally, the Town of Plymouth has indicated to the Department that it is considering developing another potable well in the area should Plymouth Rock Studios decide to connect to the Plymouth system.

Should Plymouth Rock Studios decide to connect to the Town of Plymouth PWS, a BRP WS32 permit application, *Distribution Modifications for Systems that serve more than 3,300 people*, is required in accordance with Department DWP/Policy 08-01 for the addition of the proposed 500,000 gallon storage tank. Policy 08-01 can be accessed at: http://www.mass.gov/dep/water/laws/dwpp0801.doc.

Under this alternative, the EIR should clarify whether Plymouth Rock Studios would become a consecutive system to the Town of Plymouth PWS or would be a customer of the Town's PWS.

On-site Water Supply Alternative

Simultaneously with the EENF submittal, and in anticipation of the permitting requirements for developing its own water supply, Plymouth Rock Studios has submitted a BRP WS 17 application for approval to site and conduct a pumping test for a source of >70 gallons per minute and a BRP WM03 application for a Water Management Act Permit. Notice of public comment period for the WMA Permit application was also published in the November 24, 2008 *Environmental Monitor*.

Drinking Water Permitting

As identified in the EENF, Plymouth Rock Studios must meet the requirements of the Department's New Source Approval (NSA) process in order to site a new potable well and become a registered PWS. As noted above, Plymouth Rock Studios has submitted a BRP WS 17 application, and will be required to file under the NSA process a BRP WS 19 application for approval of pumping test report for source of 70 gallons per minute or greater and a BRP WS 20 application for approval to construct a source of 70 gallons per minute or greater. Should these applications be approved and following construction, the Department would conduct an inspection of the system before issuing final approval.

In addition to meeting the NSA requirements, Plymouth Rock Studios is referred to the Department's *Guidelines for Public Water Systems* for additional requirements for a registered PWS. The guidelines can be found at: http://www.mass.gov/dep/water/laws/policies.htm#dwguid

Among other things, Plymouth Rock Studios would need to: demonstrate financial capacity by submitting a business plan to the Department for review and approval; meet certified operator requirements; establish a cross connection program; develop an emergency response plan; meet best effort requirements for wellhead protection; meet reporting and testing requirements, etc. As a private water company, Plymouth Rock Studios would be subject to oversight by the Massachusetts Department of Utilities (DPU) with regard to setting water rates for sale of water to potential customers (i.e. Plymouth South Schools, etc.), other than as landlord supplying his tenant. Information on DPU's Water Division can be found at: http://www.mass.gov/?pageID=eoeeasubtopic&L=3&L0=Home&L1=Energy%2c+Utilities+%26+Clean+Technologies&L2=Water+Distribution+%26%2345%3b+Investor-Owned+Utilities&sid=Eoeea.

At the December 18, 2008 site exam conducted in support of the BRP WS 17 application it was noted that the proposed location of the potable well is located adjacent to one of the two existing lined ponds used for irrigation by Waverly Oaks. In addition, portions of both ponds would be within the Zone I wellhead protection area of this well. To address concerns regarding compliance with the requirements of the Surface Water Treatment Rule, Plymouth Rock Studios should either fill in the ponds during construction of the facility or move the proposed location of the potable well 150' feet from any edge of the ponds so as to avoid the potential for groundwater under the influence of surface water. If either of the options is not selected by the proponent, Plymouth Rock Studios will be subject to the requirements of the Surface Water Treatment Rule. The proponent is referred to section 4.18 of the **2008 Guidelines for Public Water Systems** for further information regarding the Surface Water Treatment Rule; this section can be accessed at: http://www.mass.gov/dep/water/laws/gl08ch04.doc. The EIR should state how Plymouth Rock Studios will address the concerns regarding the Surface Water Treatment Rule.

Even if the location of the proposed well is moved 150' away from the ponds, portions of both ponds still would be within the Zone I wellhead protection area. If the ponds are not to be filled in, the EIR should detail how the proponent intends to use these ponds (i.e., aesthetics only, stormwater retention, irrigation, etc.). If the ponds are to be used for any purpose other than aesthetics, then MassDEP may impose certain restrictions and/or requirements for use if and when a permit is issued. At a minimum, if the ponds were to be used for irrigation, then a backflow prevention device would be required for the connection between the irrigation system and the water distribution system. If the lined ponds are to remain on the site and within the Zone I of the proposed well, the EIR should also include the specifications for the liners, the current condition of the liners and the anticipated lifetime of the liners.

In order to provide redundancy, to assure a continuous supply of water to customers and to protect public health and safety, the Department recommends interconnections with other Public Water Supply Systems to avoid disruptions in water supply. The EIR should discuss how Plymouth Rock Studios will address any potential disruption of its supply.

Section 7.3.1.4 notes that existing potable and irrigation wells at Waverly Oaks are to be abandoned. The proponent is referred to section 4.21 of the **2008 Guidelines for Public Water Systems** for further information regarding well abandonment and decommissioning for PWS wells. The irrigation wells should also be decommissioned in accordance with the Guidelines to avoid potential hazards, contamination, etc.

Plymouth Rock Studios is proposing a bike path/pedestrian way adjacent to the proposed access road. Under the preliminary design, a portion of this bike path/pedestrian way would be in the Zone I area of a proposed drinking water well for the Town of Plymouth. The Department would allow this type of passive recreation within the Zone I area provided that no comfort station or picnic facilities associated with the bike path/pedestrian way would be located within the Zone I. The Department would recommend that the portion of the bike path/pedestrian way within the Zone I be unpaved or paved with porous material. MassDEP should be consulted before the final determination of the pathway material is chosen. In addition, to the extent possible, drainage from the bike path/pedestrian way, as well as the access road should be directed away from the Zone I. The proponent should work with the Town of Plymouth to ensure protection of the Zone I of the proposed well. If this portion of the project is to be included in the Phase I waiver request, then the request for waiver should address this issue.

Water Management Act Permitting

The WMA application requests to withdraw a daily average volume of 0.171 million gallons per day (MGD), for a total annual withdrawal of 62.45 million gallons per year (MGY), through 2019. In 2020, the requested withdrawal would increase to an average daily volume of 0.174 MGD, for a total annual withdrawal of 63.5 MGY. Withdrawal would be made from one groundwater well to be located in the Eel River Subwatershed of the South Coastal Basin. WMA Permits in the South Coastal Basin are scheduled to expire on August 31, 2010. If a WMA Permit was to be issued to Plymouth Rock Studios, and if that permit was issued before August 31, 2010, that Permit would expire on August 31, 2010 and Plymouth Rock Studio would be required to file for a permit renewal.

The WMA Permit application does not include a pumping test report and impact analysis for the proposed new source. A pumping test of the groundwater source is proposed to be conducted in January 2009. The results of this pumping test and analysis should be made available in the EIR. The Department will review all comments on the pumping test, as well as other comments made during the MEPA review process, prior to taking action on the permit application. (Note, in accordance with MEPA regulations [301 CMR 11.12(4)(a)], a Certificate of the Secretary of Environmental Affairs is required for the project before the Department will take any action on the WMA Permit application.)

Additional opportunity for public comment will be available if and when the Department issues a draft WMA Permit for Plymouth Rock Studios.

If a WMA Permit is issued to Plymouth Rock Studios, it would contain the requirement for 10% unaccounted-for water, an average day residential use of 65 gallons per capita per day (for that small residential portion of the proposed project), implementation of a water conservation program and implementation of a seasonal demand management plan.

Water Conservation and Sustainable Design
The EENF cites measures to be implemented to conserve water, including use of rainwater for the preferred source of irrigation water. The EENF does not provide the estimated volume of irrigation water required. Whether Plymouth Rock Studios connects to the Plymouth PWS or develops its own potable supply, it will be subject to the WMA requirements for seasonal demand management and water conservation. The proponent should review the 2006 *Massachusetts Water Conservation Standards* and the EIR should detail how the project will meet the relevant standards; the Water Conservation Standards can be accessed at:
http://www.mass.gov/envir/mwrc/pdf/Conservation_Standards.pdf.

If you have any questions pertaining to the Water Supply Program/Water Management Act comments noted above, please call Leslie O'Shea at (508) 946-2837.

Construction Activities - EPA
The project construction activities may disturb one or more acres of land and therefore, may require a NPDES Stormwater Permit for Construction Activities as the EENF indicates. The proponent can access information regarding the NPDES Stormwater requirements and an application for the Construction General Permit at the EPA website:
http://cfpub.epa.gov/npdes/stormwater/cgp.cfm

Wastewater Management
Industrial Waste Water
Wastewater generated during the production of movies (SIC 7812) is defined as industrial wastewater. This water may need pretreatment and/or flow equalization before it can be accepted into the Plymouth WWTP. The EIR should discuss the types and volumes of Industrial Wastewater that are foreseeable to be generated by the project. This analysis should include proposed techniques for capture, treatment and storage of this wastewater. The proponent should coordinate with the Town of Plymouth to obtain an Industrial Wastewater permit.

If the proponent is intending to use SIC 7818 or generates Hazardous Industrial Wastewater, permitting may be necessary for the Industrial Wastewater discharge if the flow is greater than 50,000 gallons per day.

Industrial Wastewater that is to be disposed of onsite would likely require a Groundwater Discharge Permit. MassDEP is available for consultation to determine the proper permit category.

Sewer Connection/Extension

The Plymouth Harbor estuary (Segment MA94) is listed as an impaired waterbody due to excessive nutrients (likely nitrogen). Stormwater runoff, onsite septic systems, and the discharge from the Plymouth WWTP are some of the sources that contribute nutrients to the estuary. It is likely that a reduction of nutrients from these sources will be required to aid in the recovery of this impaired water. It would appear that his project will increase the nutrient load in this estuary by adding increased flow to the Plymouth WWTP. The proponent has chosen a preferred alternative that avoids densely populated roadways many of which are located in the watershed that contributes to the estuary. If the sewer main were located in theses roadways and the adjacent homes connected, a net reduction if nutrients into the estuary could occur due to the reduction in the number of onsite septic systems. Furthermore these roadways could be reconfigured as necessary to improve safety and be designed to more efficiently address stormwater. The EIR should evaluate each of the configurations for a sewer extension and estimate the potential for onsite septic systems that could be abandoned.

It was noted in the EENF that the preferred alternative was chosen due to the belief that the sewer extension would promote growth in the area. MassDEP believes that effective growth management should be instituted by zoning or other directly applicable requirements, not through the development of a wastewater collection system. It should also be noted that a local bylaw could delay the need for homeowners to be serviced by the public sewer by either events, such as a failed system, or by a certain date.

The proposed discharge for the Plymouth Rock Studio is greater than 50,000 gallons per day, therefore if not permitted through the industrial wastewater program; a Sanitary Sewer Connection permit will be required.

The proposed Sewer Extension will be greater than 1,000 feet and therefore will require a Sewer Extension Permit issued by the Department. The permit application category is BRP WP71.

Headworks Modification to Wastewater Treatment Facility

As part of the construction project to extend the sewer from the proposed studio complex to the town wastewater treatment facility, it is also proposed to modify the headworks of the treatment facility to provide preliminary treatment of grit and screenings removal. If possible, concurrent with the extension permit application, should be an application to DEP for a "Treatment Works Plan Approval without Permit Modification". It is a category BRPWP68. The proponent may wish to work closely with the Town in preparing this application for submittal.

Comprehensive Wastewater Management Plan (CWMP)

The connection of this project was not contemplated in the approved Plymouth (CWMP) (EEA #8228). The Town of Plymouth will need to file a Notice of Project Change (NPC) in order to include the project in the CWMP. The NPC submittal should be coordinated to coincide with the submission of this project's MEPA documents.

Construction of Water Reuse Pipeline

The Proponent is proposing construction of a water reuse pipeline in the same excavation as the Sewer Extension pipeline. The Department is currently in the process of promulgating regulations that will regulate and permit the reuse of treated wastewater (314 CMR 20.00). It is likely that these regulations will be in place prior to the beginning of construction of this project. These regulations contemplate that the entire reuse project will be constructed at the time the reuse water is available and as such all the components are permitted together. In order to avoid partial permitting under 314 CMR 20.00, the Department is requesting that a permit application to construct the water reuse pipeline must be submitted by the Town of Plymouth, as it is a proposed modification to the effluent structure of the wastewater treatment facility. That permit category is BRPWP68. The proponent may wish to work closely with the Town in preparing this application for submittal. The reuse pipeline shall meet requirements of 314 CMR 20.00 and use of the pipeline shall not occur until a final Water Reuse permit is issued. The proponent should also show the design details of the reuse pipeline on the plan as part of their Sewer Extension permit application (BRPWP71) for this project.

Geothermal Wells

Shortly, the Groundwater Discharge Permit regulations, 314 CMR 5.00 will be revised and promulgated. The final language of those regulations should be closely examined to see if any proposed geothermal well requires DEP permitting.

Stormwater Management

MassDEP is in the process of adopting new statewide stormwater regulations (314 CMR 21.00). When adopted; these regulations will require existing properties, redevelopments, and new projects with larger impervious areas to meet specific statewide stormwater management requirements and, in certain TMDL areas, to reduce pollutants that impair surface waters by specific percentages.

These new rules are anticipated to take effect in the first half of 2009 and pursuant to proposed Transition rules, will apply to all projects that have not commenced 6 months after the proposed general permit is issued.

Therefore MassDEP recommends that all projects that will result in 5 acres or more of impervious area (including roofs) statewide or in 2 acres or more of impervious area (including roofs) in the Charles River or other listed TMDL watersheds and that are scheduled to commence on or after October 1, 2009 meet all requirements of 314 CMR 21.00 as proposed. Some projects may be required to retrofit their facilities to meet all the required Performance Standards. It is recommended that projects in the design phase attempt to meet these performance standards to minimize the possibility of future cost and disruption. The infiltration contemplated by these regulations is considered to be mitigation for the Project's water usage. The MassDEP website contains information regarding the proposed regulations.

Resource Conservation and Recovery Act (RCRA)
If any occupant of the project will generate hazardous waste and/or waste oil, that entity must register with the MassDEP or EPA to obtain a permanent identification number for legally generating and managing regulated waste.

Air Quality
Some Commercial activities have air emissions associated with them and require air quality permitting from MassDEP before construction and/or operation. Facility heating may also require MassDEP air quality permitting.

The installation and operation of certain fuel burning equipment (boilers, emergency generators, etc) may be exempt from Plan Approval requirements contained in 310 CMR 7.02(4) or (5). To determine if permitting is required for fuel burning equipment please refer to:

- 310 CMR 7.26(30) Boilers – Applicability
- 310 CMR 7.26(40) Engines and Combustion Turbines – Applicability

Construction and operation activities shall not cause or contribute to a condition of air pollution due to dust, odor or noise. To determine the appropriate requirements please refer to:

- 310 CMR 7.09 Dust, Odor, Construction, and Demolition
- 310 CMR 7.10 Noise

Pyrotechnics and other special effects may meet the thresholds to require a Plan Approval under 310 CMR 7.02. MassDEP recommends meeting with the Air Quality permitting Section to determine if a permit is necessary and, if so, for assistance in the preparation of the permit application. It should be noted that these activities may also be regulated and permitted by the Executive Office of Public Safety and Security, Department of Fire Services.

Bureau of Waste Site Cleanup
Based on the information provided in the EENF, the Bureau of Waste Site Cleanup (BWSC) searched its database for disposal sites and release notifications. The subject project was not listed as a current site. In addition, no other disposal sites were listed in the immediate vicinity of the proposed project.

The Project Proponent is advised that, if oil and/or hazardous material is identified during the implementation of this project, notification pursuant to the Massachusetts Contingency Plan (310 CMR 40.0000) must be made to MassDEP, if necessary. A Licensed Site Professional (LSP) may be retained to determine if notification is required and, if need be, to render appropriate opinions. The LSP may evaluate whether risk reduction measures are necessary or prudent if contamination is present. The BWSC may be contacted for guidance if questions regarding cleanup arise.

Greenhouse Gas Emissions

This project requires an environmental impact report and a Massachusetts Highway Department (MHD) access permit; therefore, the project is subject to the MEPA Greenhouse Gas Emissions Policy and Protocol ("the Policy"): http://www.mass.gov/envir/mepa/pdffiles/misc/GHG Policy FINAL.pdf . The policy requires project proponents to quantify their greenhouse gas emissions and identify measures to avoid, minimize, and mitigate these emissions.

It is evident from the measures included in the GHG portion of the EENF that the goal of the proponents of the Plymouth Rock Studio (PRS) project is to create a project which will serve as an example of progressive design, integrating innovative, practical and proven architectural and engineering methods to both conserve energy and to reduce the emission of greenhouse gasses.

These comments are not intended to question this effort, but instead to provide observations which will be helpful to the proponents in achieving this goals as well as in meeting the requirements and objectives of MEPA's Greenhouse Gas (GHG) Emissions Policy and Protocol.

As the project moves forward, it is recommended that the project proponent contact the New Construction division of its electric and gas utility provider, NStar, to take advantage of any potential rebates available for the installation of highly energy efficient equipment.

Code Issues:

As explained in the MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol, the proponent's energy model must be optimized for the MA State Building Code, which is the baseline alternative for energy use in calculating GHG emissions.

The Energy Code selected for the base code compliant case in the EENF is Mass. Building Code Chapter 780 CMR 13.00 6th ed. (Energy Conservation). This edition was superseded by 780 CMR 13 7th ed. in Sept. 2008. The 7th ed. includes higher performance standards in some significant instances than the 6th ed. The Sept. 2008 7th ed. was in turn superseded by an amended version which took effect on Oct. 18, 2008. The amended version changed the energy conservation portion of the commercial building code such that it now adopts and integrates either the current version of the International Energy Conservation Code (IECC) or ASHRAE 90.1. At present the current versions of each are:

- The IECC 2006 with 2007 supplement
- The ASHRAE 90.1 2006 with 2007 supplement.

Ideally, the base (code compliant) case (Case 1) would have been the Sept.2008 780 CMR 13.00 7th ed., with the as Proposed (with mitigation) case (Case 2) meeting or exceeding 780 CMR13.00 7th ed. amended, which would ensure that the proposed project would be have been designed to and have incurred the benefits from improvements to the

Code specifically targeted raising the standards of energy efficiency and the reduction of greenhouse gas emissions.
In recognition that the Greenhouse Gas Analysis and the related project design decisions were being developed during the period when these changes to the code were occurring, the code related review criteria and comments are based upon:

- Verification that Case 1 meets what is required by 780 CMR 310 6th ed.
- Verification that Case 2 exceeds in important instances what is required by Case 1
- Comparison of Cases 2 & 3 against the requirements of the current code, 780 CMR 310 7th ed. (amended).

In addition to code related comments, the comments are organized as follows:

- Estimated GHG emission reductions: Review of the methods and results.
- Additional Stationary Source Mitigation Levels as Proposed
- Additional Stationary Source Levels Undergoing Further Study
- Non-specific and LEED related comments intended to highlight areas that have been designated as either commonly overlooked and/or having proved to be cost effective GHG control measures.

Code Related Comments.

Building Envelope (per EENF page 12-13, Table 12.4-3)
The EENF states that the DOE EQUEST software was used to model the performance of the building and system elements. EQUEST is specifically cited in the MEPA Greenhouse Gas Emissions Policy and Protocol, however in this review the values included in the Table were compared with those as contained in the actual Codes as follows.

Glazing U Value (All Systems)
Case 2: The U-value as proposed is 0.3
Case 1(base): Exceeds the requirement by a factor of 1.67.
780 CMR 13.00 7th (current): Exceeds the requirement by a factor of 1.2

Comment (C1): The proposed U-value exceeds both base and current code. However, given the significance of glazing performance in determining design building heating and cooling loads, a 20% improvement over what is now required by code may not reflect the best performing off-the-shelf glazing systems which can be shown to be cost effective over the expected lifetime. We suggest that the project investigate this possibility for incorporation during the detailed design.

Roofing R-values, up to 10% Glazing (Except Sound Stages)
Case 2: R-24 proposed.
Case 1(base): Exceeds the requirement for all wood joist and truss by a factor of 1.26.

- Note: Does not comply with R-25 required for non-wood construction.

780 CMR 13.00 7th (current): For the applicable building types, the performance requirements in the current IECC (Table 502.1.2; 2007 supplement), expressed as U-values and irrespective of area glazed, are:

- Attic and other is U-0.034 (equivalent to R-21). The proposed R-24 exceeds this by a factor of 1.14.
- Insulation entirely above deck is U-0.048 (equivalent to R-30). The proposed R-24 is non-compliant.

Roofing R-values >30% Glazing (Except Sound Stages)
Case 2: R-30 proposed.
Case 1(base): Meets the requirement.
780 CMR 13.00 7th (current): Same as above.

Comment (C2): In the spirit of including significant elements that exceed the code requirements, the enhanced performance and cost effectiveness of a greater R-value roof should be evaluated. Resulting reduced building design HVAC loads could result in smaller less expensive mechanical units as well as a reduced annual energy usage.

HVAC and Lighting Systems (per EENF page 12-13, Table 12.4-3

Water Cooled Chiller: All Zone 1; Zone 2: Hotel and Spa Fan Coil Supplies
Case 2: As proposed EIR is 0.128.

> **Note**: EIR commonly refers to the Energy Input Ratio, which is the ratio of the air supply fan power to the chiller drive power and is not a direct expression of the chiller efficiency.

Case 1(base): The base code minimum efficiency is expressed in terms of the Coefficient of Performance (COP) (not EIR). For water cooled chillers > 300 Tons capacity the minimum required value for COP is 6.10. There is no basis of comparison with the EIR information as given in the Table.
780 CMR 13.00 7th (current): Same as for Case 1 above.

Comment (C3): As stated above, all of the reference codes require that the efficiency of the water cooled chillers be stated as a COP, and that COPs be indexed by type (reciprocating, screw, centrifugal, etc.) and capacity (tonnage).

Comment (C4): With respect to the as proposed EIR, applying R = 0.128 to the loads served by the proposed central plant chillers (as shown in the Energy Modeling results Table) and using a COP of 6.10, our calculations indicate that the maximum allowable supply air fan power would be approximately 22 HP. This seems low for the combined air supply needed for 818,000 ft2 of conditioned space.

Case 2: As proposed EIR (energy efficiency rating) is 0.128 (See Comment C3 above)
780 CMR 13.00 7th (current): Same as for Case 1 above.

Lighting Power Density (LPD) All Systems)
Case 2: This level was compared with code values listed for "Offices (open plan)" in the base code. The requirement for this usage is 1.5 W/ft2. The U-value as proposed is "20% better than code" which equates to an LPD of 1.25 W/ft2.
Case 1 (base): Exceeds the requirement by a factor of 1.25
780 CMR 13.00 7th (current): Non-compliant. The max allowable LPD per IECC is 1.0. The proposed LPD is 25% above allowable.

Comment (C5): The proposed LPD seems to be well above the maximum allowable by the IECC. We suggest that in conformance with the statement page on 12-12 of the EENF that the proposed design will be fully compliant with the IECC code, the proposed LPD should be revisited.
Incorporation of energy efficient lights and fixtures may assist in achieving these LPD levels. For interior spaces, enhanced or "Super T8" lighting, T5 or metal halide lighting should be installed, and for exit signs, LED lighting.

Additional Stationary Source Mitigation Measures as Proposed

Solar Photovoltaic (PV) System
Comment (C6): Although the current incentive is limited to 500 kW per entity per year, we suggest that all of the project roofs and building electrical systems be designed, (including orientation) to support the future installation of PV systems without the need for substantial modifications. Also, space and clear sun requirements for future PV systems should be addressed in the layout of roof level equipment, vents and other structures.

Solar Hot Water Systems
Comment (C7): We suggest the buildings for which solar hot water systems were not selected be evaluated and prioritized by their potential for future installations. The higher ranking buildings should be designed to support the installation of future solar hot water systems without the need for substantial modifications.

High Performance Glazing:
Comment (C8): The levels as proposed (see comment C1 above) may not support designation as "high performance."

Additional Stationary Source Mitigation Measures Undergoing Study

Combined Heat and Power (CHP)) (Cogeneration):
Comment (C9): It would appear that the proposed central heating and cooling plant would be a candidate for a cost effective CHP installation. If securing a sufficient year round thermal load is a barrier, an option would be to substitute steam or high temperature hot water driven absorption chillers for one or more the as proposed electrical drive chiller units. This would potentially reduce GHG emissions in two ways:

- Reduce the summer grid peak load, which would in turn reduce operations of "peaker" generating plants that generate power at lower than average heat rates (higher than average CO2 emission rates).
- Reduce the annual fuel consumption (and related CO2 emissions) when compared with what would be required by supplying natural gas and grid supplied power as would be required to operate the central plant with grid power as proposed.

We suggest that the continued study of a CHP option include an economic analysis for this concept, which should include the value of any applicable alternative energy credits for which the system would qualify under the proposed Mass. Alternate Energy Portfolio Standards (APS). Details for APS program can be found at

http://www.mass.gov/Eoeea/docs/doer/rps/aps-225-cmr-16.pdf

In addition, a CHP plant would likely present an opportunity to enroll and benefit from one of the Demand Response Programs as offered by ISO New England. As applicable, these benefits should be included in any economic analysis.

Direct and Indirect Energy Use and CO2 Emissions (page 12-14 Table 12.4-4 and Appendix 12-2)
EQUEST Model Input Summary (Appendix Table 1)
Comment (C10): The values for the efficiencies for significant energy using equipment (e.g. chillers, boilers, heaters, etc.) are not shown. These should be shown in subsequent filings.

Energy Use and CO2 Emissions (Appendix Tables 2, 3, & 4):
Although almost all of these results show positive savings, the basis of comparison is with 780 CMR 13.00 6th ed. We suggest that in order to test the performance of the proposed design against the goal of achieving exemplary performance, additional EQUEST model runs be included in subsequent filings using the most current code as the basis of comparison.

Non-Specific and LEED Related Comments:
Building Orientation - The subsequent filing needs to note clearly how the buildings will be oriented, why, and the expected impacts on energy usage including solar gain, day-lighting and effect on proposed and future solar energy collection systems.

Duct Insulation – Duct insulation is the baseline required by code. To enhance efficiency, the subsequent filing should note, and construction should reflect, that all ducts will be sealed with mastic, tested and then insulated, since duct leakage can be a major factor in energy losses.

High-Albedo Roofing Materials – The subsequent filing should fully consider these roofing materials, which are highly reflective and reduce cooling requirements for buildings. For roofing, USGBC provides LEED credit for low-slope roofs with a minimum SRI of 78 and for steep-slope roofs with a minimum SRI of 29.

To qualify for an Energy Star label:
– Low Slope roofs must have an initial solar reflectance of >= 0.65. After 3 years, the solar reflectance must be >= 0.50.
– Steep Slope roofs must have an initial solar reflectance of >= 0.25. After 3 years, the solar reflectance must be >= 0.15.
In addition, the performance of solar PV systems is improved when mounted on high albedo roofs.

Third Party Building Commissioning – The subsequent filing should fully consider building commissioning, and for it to be conducted by a third party to ensure the commissioning process is thorough and energy performance of the building is maximized. In accordance with the Green Communities Act, building code revisions will be issued that will make building commissioning required for all non-residential buildings greater than 10,000 square feet.

Lighting Motion Sensors, Climate Control and Building Energy Management Systems - To ensure that the energy systems function as designed long term, a strategy should be developed for monitoring energy performance of all buildings where the energy systems are centrally controlled, possible through a building management system. A building energy management system can incorporate basic energy saving measures such as lighting and climate control. Climate and lighting control should definitely be included for the building. Lighting control can provide savings for spaces that are occupied infrequently, such as storage areas. A system or strategy for monitoring energy performance would be expected to pay for itself through eliminating potential inefficient building energy operations, such as heating and cooling operating simultaneously in January.

Transportation Related Comments
MassDEP thanks the project proponent for its efforts to assess and address the impact the project will have on air quality in 2018. However, MassDEP requests that the project proponent address several issues relating to the mesoscale analysis and the transportation demand management (TDM) measures.

Mesoscale Analysis

The project proponent conducted a mesoscale analysis for volatile organic compounds (VOCs) and oxides of nitrogen (NOx). According to the EENF, the project will draw 8,950 new daily vehicle trips to the project in 2018. As noted in the EENF, the mesoscale air quality analysis of the Build condition compared with the No-Build condition indicates that the projected vehicle trips will result in a 28% increase in VOC emissions and a 23% increase in NOx emissions. These emission increases reflect the impact of the travel to and from the site. However, the current mesoscale analysis does not include the vehicle travel trips that are expected to take place *within* the 242-acre site as employees and patrons visit the various buildings on the three campuses. MassDEP requests that the project proponent also conduct an analysis of the impact of the vehicle emissions that are expected to occur

within the site in 2018 and show the results in the Single Environmental Impact Report (Single EIR).

Furthermore, Section 6.4.3.1 on page 6-57 of the EENF describes Alternative 1, the project preferred site access route choice pursuant to the Massachusetts Highway Department (MHD) and Plymouth alternatives analysis requirement. The Single EIR should confirm that the preferred alternative traffic volumes are the basis of the mesocale analysis.

Greenhouse Gas Analysis

Table 12.4-5 on page 12-17 of the EENF describes the Build condition as providing a 4% reduction in carbon dioxide (CO2) emissions over the No-Build condition (6,664 vs. 6,916 tpy). This is attributed to a 10% project trip reduction associated with the use of transit modes within the commercial, educational, and residential components; however, this transit credit is not applied to the movie and production components. The explanation that the transit "trips are reflected in the methodology used to develop the traffic characteristics for Development Zone 1" is unclear; the Single EIR needs to provide a more comprehensive explanation as to why the transit trips are not included in the movie and production components.

Transportation Demand Management (TDM) Measures

Additional TDMs

MassDEP acknowledges the incentives the proponent has committed to put in place, such as subsidizing MBTA *Charlie Cards*, designating an on-site transportation coordinator, and assigning special parking spaces for carpoolers and vanpoolers. MassDEP also notes that the project proponent may consider implementing the measures listed on p. 6-102 of the EENF, such as participating in carpool/vanpool matching programs in a Transportation Management Association (TMA) and working with MassRIDES to lease commuter vans.

However, the mitigation measures the project proponent plans to implement do not appear to decrease the VOCs and NOx emissions associated with the Build condition in 2018. In fact, the EENF shows that the addition of new entrance ramps to Route 3 to promote travel to the project will increase, rather than decrease, trips in the Build with Mitigation scenario. Therefore MassDEP requests that the project proponent demonstrate additional good faith efforts to develop and implement mitigation measures to offset these increases. The Single EIR should discuss in detail the additional measures that will be implemented and maintained at the project.

MassDEP recommends that the following TDM measures, at a minimum, should be implemented at the project:

- **Guaranteed Ride Home Program.** MassDEP requests that the proponent establish an emergency ride home program for all project employees who travel by carpools/vanpools. In a GRH program, the employer provides emergency

rides home in the form of taxis or work vehicles to employees that carpool or vanpool to work.

- **Neighborhood Electric Vehicles (NEVs).** MassDEP requests that the project proponent implement and maintain a fleet of NEVs for vehicle trips occurring within the project site to further mitigate emissions from conventionally fueled vehicles. In addition, MassDEP recommends the use of electric emission touring vehicles should the studio offers tours to visitors.

- **Bicycle Incentives.** To promote additional bicycling to the site, MassDEP recommends that the proponent install employee locker and shower facilities at the site and provide other enhancements (e.g., bicycle helmets, coupons to bike stores and bike locks).

- **Other incentives**: MassDEP recommends that the project proponent explore other ways to encourage visitors to use transit or carpool to the proposed project, including offering discounts to customers who come to the studio complex in a carpool, by transit or another method.

Other Policies and Measures

MassDEP also recommends that the project proponent institute the following policies and measures to help reduce vehicle trips and encourage other modes of travel:

- **Walking Incentives.** To increase pedestrian access to and within the site, MassDEP recommends that the proponent install benches and other amenities. All sidewalks within or adjacent to a project should also be a minimum of 5' wide with vertical curbing.

- **Delivery Restrictions.** MassDEP recommends that the proponent restrict truck deliveries to off-peak hours to minimize traffic impacts and diesel emissions in the project area.

- **Traffic Calming.** Traffic calming measures in excess of jurisdiction requirements provide motor vehicle speed reduction and encourage bicycle and pedestrian trips. All intersections within or adjacent to a project should feature one or more of the following traffic calming design techniques: marked crosswalks, curb extensions, speed tables, raised crosswalks, raised intersections and median islands. Streets internal to the project should feature pedestrian, safety/traffic calming measures such as planter strips, street trees and variations in road width to discourage high-speed travel.

Clarification of Statements Regarding TDMs

MassDEP requests that the following statements or issues be clarified in the Single EIR:

- A word or statement appears to be omitted from following statement in Section 6.5.2.3 on page 6-102 of the EENF: "In addition, roadway and

> intersection improvements to be designed and constructed as part of the Project will include provisions for bicycle travel, including both [?] and off-road bicycle paths as appropriate."

MHD already requires bike and pedestrian accommodation for new roads and intersections. Please identify the actual project-specific improvements.

The Boston to Cape Cod, Claire Saltonstall Bike Route traverses the project study area along Long Pond Road. The heavily travelled roadway has a posted speed of 35 mph and a shoulder width of less than one foot. This Route segment would greatly benefit from installation of a minimum four-foot striped bicycle lane. MassDEP recommends that the project proponent provide funding for and work with MHD and Plymouth officials to implement this measure

Construction Period Air Quality Mitigation Measures
MassDEP acknowledges the project proponent's effort to encourage subcontracts to use low sulfur fuel in their construction vehicles. Due to the expected air emissions of the project, however, MassDEP believes it is necessary for the project proponent to mitigate further the construction-period impacts of the project. Construction engines emit over one-quarter of the diesel emissions in Massachusetts. These diesel emissions contain fine particulate matter 2.5 microns or less in diameter (PM2.5), which has been found to exacerbate asthma and respiratory ailments. Diesel PM2.5 has also been identified as a likely carcinogen.

MassDEP recommends that the project proponent install after-engine emission controls such as diesel oxidation catalysts (DOCs) or diesel particulate filters (DPFs) to reduce diesel PM2.5. For more information see MassDEP's guidance document, Diesel Engine Retrofits in the Construction Industry –A How to Guide, (available on MassDEP's website at http://www.mass.gov/dep/air/diesel/conretro.pdf) or contact MassDEP's Gary Rennie at 617-292-5869.

In addition, MassDEP recommends that the project proponent use ultra low sulfur diesel (ULSD) fuel. ULSD fuel has a sulfur content of approximately 15 parts per million (ppm) in contrast to the 500 ppm sulfur level of current off-road diesel fuel recently required by the U.S. Environmental Protection Agency (EPA). The use of ULSD fuel, in conjunction with after-engine emission controls, can reduce additional amounts of $PM2._5$.

Regulations
MassDEP would like to remind the project proponent of two Massachusetts regulations that pertain to curtailing air emissions:

- **Massachusetts Rideshare Regulation:** The Rideshare Regulation (310 CMR 7.16) is a clean air program that applies to employers with 250 or more daily employees. Employers subject to the Rideshare Program must implement a series of incentives that are designed to reduce the number of trips made by employees who drive alone to work. To date, employers with 1,000 or more employees and

employers with 250 or more employees that are also subject to the Air Operating Permit Program (as detailed in MassDEP's regulation, 310 CMR 7.00, Appendix C) must comply with the Rideshare regulation. The Rideshare Program requires employers to submit annual reports, determine how their employees commute to work, and provide transit passes and a carpool-matching program to employees, among other incentives. Should the proposed project employ 250 or more employees, the project proponent should contact MassDEP at 617-292-5663 for assistance in complying with this air quality program.

- **Massachusetts Idling Regulation** The Massachusetts Idling regulation (310 CMR 7.11) prohibits motor vehicles from idling their engines more than five minutes unless the idling is necessary to service the vehicle or to operate engine-assisted power equipment (such as refrigeration units) or other associated power. The proponent should consider posting idling restriction signs on the premises to remind all drivers, patrons, and delivery personnel of the state's idling regulation. Questions regarding this regulation should be directed to Julie Ross of MassDEP at 617-292-5958.

Should you have any questions about the comments in this section, please contact Susan Lyon at 617-556-1101.

Water Related Energy Use

Although the main sources of GHG associated with this proposed project include building heating and cooling, lighting, and vehicle travel to and from the proposed development, the energy required to provide potable water and treat wastewater also will be a source of GHG. To gain an understating of the correlation between water/wastewater volumes and energy use requirements, MassDEP has considered major utilities in the state and reviewed relevant research. For example, the Massachusetts Water Resources Authority (MWRA) estimates the average energy cost wastewater treatment at their Deer Island facility is 1.2 - 1.4 kWh/kgal. Similarly, a study of wastewater treatment plants in Wisconsin found that 1.5 kWh/kgal was required to treat wastewater in that state's wastewater treatment plants. This proposed development will generate approximately 166,000 gallons of wastewater per day or approximately 60,590,000 gallons per year. Using an average energy cost of 1.3 kWh/kgal the project will require approximately 78,767 kWh over the course of a year. The project proponent should consider this additional energy use when proposing measures to mitigate the additional GHG emissions that will result from treating wastewater from this proposed project.

In addition, the MWRA estimates that treating and transporting drinking water at their John Carroll Water Treatment Plant requires 0.14 to 0.23 kWh/kgal. This is slightly less than the estimated 0.3 kWh/kgal required to treat and transport drinking water at the Worcester Water Filtration facility. As noted in the EENF, the proposed project will require 166,000 gallons of potable water per day, or 60,590,000 gallons per year. Using energy costs of about 0.2 kWh/kgal, approximately 12,118 kWh will be required to supply the proposed project with potable water annually. As with wastewater, the project proponent should consider this additional energy use when proposing measures to mitigate the additional

GHG emissions that will result from providing potable water for this proposed project. Mitigation measures for water and wastewater may include improvements to the distribution systems for the public water supply to eliminate un-accounted for water losses and infiltration and inflow (I/I) removal from sewer mains, in addition to water conservation measures.

Materials Management

In order to address GHG emissions related to materials management in the EIR, MassDEP requests that the applicant quantify the GHG impacts of materials management for the project development and projected future operation. By quantifying these impacts, the applicant's GHG mitigation efforts related to materials management can be more clearly identified and targeted appropriately. MassDEP seeks quantification to help guide changes in the project, which provide a comprehensive approach to materials management throughout the design, construction, and operational phases of the project. There are a number of resources available to help quantify GHG impacts associated with efficient materials management, including the USEPA Warm Model, available at the following website: http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html, and the Building Reuse Calculator at: http://www.wastematch.org/calculator/calculator.htm.

During the **design phase**, MassDEP requests the applicant address waste reduction, environmentally preferable materials use, and the need to design for the storage and collection of recyclables. In order to plan for waste reduction, the applicant should consider implementing a waste prevention purchasing policy, which may include management options for reducing shipping and packaging materials, and if necessary, managing excess materials through unused product return or donation.

MassDEP also requests that the EIR provide the following information:

- a list of the environmentally preferred products to be used,
- recycling containers in public areas,
- the GHG impacts of using these materials, and
- an explanation for why an expanded commitment to use additional EPP materials (including on-site use of demolition materials, regionally produced materials, recycled content materials) is not applicable or cannot be confirmed.

The EENF does not address provisions for the storage and collection of recyclables, and MassDEP requests that specific information be provided on the square footage of the proposed storage area and the types of materials expected to be stored and recycled. The EIR should, at a minimum, demonstrate that the storage area would be sufficient to manage waste materials currently prohibited from disposal in Massachusetts. A list of these materials can be found on the MassDEP website: http://www.mass.gov/dep/recycle/solid/regs0201.htm. In addition, MassDEP requests that the applicant identify how hazardous materials generated during facilities' operations, e.g., spent fluorescent bulbs, lubricants, waste oil, and other hazardous materials, would be managed and stored.

During the **construction phase**, MassDEP recommends that the applicant's material management efforts focus on material reuse and recycling. MassDEP requests the applicant commit to developing a construction waste management plan that fully complies with the Massachusetts Waste Bans and establishes a minimum reuse/recycling goal of 50 percent. The Department has demonstrated through pilot construction projects that this planning results in significant reductions in waste and cost savings for developers. Information and resources to assist in the development and implementation of a construction management plan can be found at http://www.mass.gov/dep/recycle/reduce/managing.htm#project.

In the **operations phase,** the applicant should develop and implement a waste management plan to ensure compliance with the MassDEP Waste Bans. The Department offers resources to assist in this area including planning tools, contracting language, and lists of service providers (http://www.mass.gov/dep/recycle/reduce/assistan.htm#reduce). The waste management plan should establish a target-recycling goal of more than 50 percent. This level of recycling has been achieved consistently in similar projects with demonstrated operational cost savings and capital asset appreciation benefits.

MassDEP estimates that food waste accounts for at least 10 percent of all municipal solid waste generated in the state, or nearly 900,000 tons per year. Major sources include leftover food and soiled paper from homes, restaurants, cafeterias and institutional dining halls. The applicant should consider instituting an organics recycling program where applicable, including tenant operated facilities. Organics recycling can reduce sewer and electricity costs associated with drain disposal, help conserve scarce landfill space and reduce water treatment discharge. More information and a list of service providers can be found on the MassDEP website: http://www.mass.gov/dep/recycle/reduce/composti.htm#commercial

If you have any questions regarding the GHG comments listed above please contact Jennifer Viveiros at MassDEP/SERO at (508) 946-2739.

The MassDEP Southeast Regional Office appreciates the opportunity to comment on this proposed project. If you have any questions regarding these comments, please contact Sharon Stone at (508) 946-2846.