



The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Kathleen A. Theoharides
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
<http://www.mass.gov/envir>

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

PROJECT NAME : Northeastern University Coastal Sustainability Institute
PROJECT MUNICIPALITY : Nahant
PROJECT WATERSHED : North Coastal
EEA NUMBER : 16046
PROJECT PROPONENT : Northeastern University
DATE NOTICED IN MONITOR : June 10, 2019

Pursuant to the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62I) and Section 11.03 of the MEPA Regulations (301 CMR 11.00), I hereby determine that this project **requires** the preparation of a mandatory Draft Environmental Impact Report (DEIR). The Proponent should submit a DEIR in accordance with the Scope included in this Certificate.

Project Description

As described in the Environmental Notification Form (ENF) and supplemental information submitted to the MEPA office on July 9, 2019, the project consists of the development of a Coastal Sustainability Institute (CSI) that will include academic, research, meeting, office space and support facilities at Northeastern University's Marine Science Center (MSC). The CSI would support an additional 114 faculty, staff and students for a total campus population of 228.

The CSI will consist of an approximately 55,000 square foot (sf) structure located on top of the Murphy Bunker, which is part of the MSC. A geothermal heating and cooling system will

be located in the area to the east of the CSI. The project includes a reconfigured entrance from Nahant Road, reconstruction and minor realignment of driveways, and new parking areas that will provide 122 spaces. The project includes grading; upgrades to water, sewer, gas, electric and telecommunication systems and stormwater management; and removal of invasive plants and restoration of native species in the vicinity of the new building.

In addition, the project includes replacement of a seawater intake system and associated pump house that supports research in the Murphy Bunker and Edwards Laboratory. The seawater system will be replaced with two 14-inch high-density polyethylene (HDPE) pipes that will each have a design flow capacity of 1,200 gallons per minute (gpm). The pumps will be used on a rotating basis and operated at a maximum flow of 600 gpm. The replacement is proposed to improve the reliability of the seawater system and meet existing and future research needs of the MSC and the CSI. The discharge will consist of two alternating 16-inch diameter HDPE pipes extending approximately 275 feet into Bathing Beach Cove. Both the intake and discharge lines will be directionally drilled below the Bathing Beach seawall and emerge seaward of mean low water (MLW). The lines will be secured to the ocean floor using concrete ballast blocks. The intake structures and discharge diffusers will be mounted on a concrete pad. The dive locker and indoor aquatics lab and southwest end of the Edwards Lab will be demolished and replaced with a 3,270-sf pump house with below grade level that will have a 1,400 sf footprint.

Project Site

The 20.4-acre project site is located on East Point in Nahant. The project site is bounded by Shallow Cave Road and a residential area to the west, Canoe Beach and Nahant Bay to the north, Bathing Beach and Broad Sound to the south and Lodge Park to the east. The site is in an area designated as a Natural Resource District by the Town of Lynn.

Sole access to the site and to Lodge Park is provided via Nahant Road and an extension road that bisects the MSC campus. The site includes a public access easement to Lodge Park. The site was acquired by Northeastern in 1966 from the U.S. Government. It was formerly part of the U.S. National Coastal Defense System in World War II. Remnant military structures, including the Murphy Bunker, were converted into a 31,083-sf research facility. The MSC includes 15,081 sf of lab/research space (Edwards Laboratory), a 1,517-sf greenhouse, a 500-sf ice house and 2,854 sf of temporary trailer space. The seawater intake system consists of two 6-inch diameter HDPE intake pipes that extend approximately 350 ft from the seawall into Bathing Beach Cove. Seawater is pumped to a 1,283-sf pump house that contains two 20,000-gallon storage tanks. It is gravity fed to the Edwards Lab and Murphy Bunker. After flowing through research tanks, the seawater is discharged onto Bathing Beach through a 15-inch pipe at the Bathing Beach seawall. The pipe has been identified as a source of beach erosion. The design flow capacity of the intake system is 1,100 gpm; flows have averaged 291 gpm over the past year due to biofouling.

The project site is primarily vegetated and contains uplands and wetlands including Bordering Vegetated Wetlands (BVW), Land Subject to Coastal Storm Flowage (LSCSF), Land Under Ocean (LUO) Coastal Beach, and Coastal Bank. Previously disturbed areas associated with the bunkers, including the area above bunkers have revegetated and are primarily wooded.

Portions of the project site are located within Zone VE with base flood elevation (BFE) of 18 ft NAVD88 along the northern portion of the property; Zone AO with a ponding depth of 3 ft through the center of the property; and Zone AE with BFE of 13 ft NAVD88 and Zone VE with BFE of 17 ft NAVD88 along the southern shoreline.¹

According to the 14th edition of the Massachusetts Natural Heritage Atlas, the project is not located within mapped *Estimated or Priority Habitat of Rare Species*. East Point is identified as an Important Bird Area by MassAudubon. Nahant Bay supports recreationally and commercially significant marine fisheries resources and habitats. The project site is habitat for the spawning, larval settlement and juvenile development of winter flounder (*Pseudopleuronectes americanus*). Lobster (*Homarus americanus*) are common and are commercially and recreationally fished in this area. The site provides habitat for the larval settlement and juvenile development of lobster. Several diadromous species can also be found within the project area and include alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), American shad (*Alosa sapidissima*), rainbow smelt (*Osmerus mordax*), American eel (*Anguilla rostrata*), white perch (*Morone americana*), and Atlantic tomcod (*Microgadus tomcod*). Finally, eelgrass (*Zostera marina*) is present along the coves to the west of the site.

Prior MEPA Review

Northeastern submitted an ENF in January 2018 (EEA# 15973) which included only the seawater intake system. The ENF was withdrawn by Northeastern to address a number of issues raised by resource agencies and Nahant residents, including concerns that the CSI development was not included in the ENF. Changes to the project since the filing of the prior ENF include a reduction in the proposed operating capacity of the seawater system (from 2,400 gpm to 600 gpm); elimination of seawater use for building heating and cooling; offshore diffuser system at Bathing Beach to eliminate erosion; elimination of impacts to BVW associated with seawater system; and addition of an onsite lobster hatchery to mitigate potential lobster larvae mortality associated with the seawater intake system.

Environmental Impacts and Mitigation

Potential environmental impacts of the project are associated with alteration of 3.7 acres of land, including creation of 1.3 acres of new impervious area; alteration of historic resources and potential alteration of archaeological resources; alteration of wetland resource areas including 2,038 sf of Land Under Ocean (LUO), 820 sf of Coastal Bank; 2,038 sf of Land Containing Shellfish and 28,571 sf of Land Subject to Coastal Storm Flowage (LSCSF)²; generation of an additional 175 new average daily trips (adt) (350 total); increase in water demand by 1,094 gpd; and increase in wastewater generation by 995 gpd. The project will generate GHG emissions associated with energy use and transportation.

¹ Based on Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) Letter of Map Revision (LOMR) 18-01-0243P effective December 29, 2019 and LOMR 16-01-2425P effective July 7, 2017.

² The ENF identified 810 sf of impacts to Coastal Bank and 31,506 sf of impacts to LSCSF. Revisions were submitted to the MEPA office in an e-mail dated 7/31/2019.

Measures proposed to avoid, minimize, and mitigate project impacts include improvements to the stormwater management system, replacement of the seawater system, habitat restoration (including removal of invasive species), development of a lobster hatchery, and development of a mitigation package to address impacts to municipal infrastructure. The project will include measures to reduce GHG emissions and energy use.

Jurisdiction and Permitting

This project is subject to MEPA review and preparation of an ENF pursuant to 301 CMR 11.03(3)(b)(1)(a); (3)(b)(1)(e); (3)(b)(6); and (10)(b)(1) because it requires an Agency Action and involves the alteration of coastal bank; new fill or structure or expansion of fill or structure in a velocity zone or regulatory floodway; construction, reconstruction or expansion of an existing solid fill structure of 1,000 or more sf base area or a pile supported or bottom-anchored structure of 2,000 or more sf base area provided that the structure occupies flowed tidelands or other waterways; and demolition of all or any exterior part of any historic structure listed in or located in the any historic district listed in the State Register of Historic Places or Inventory of Historic and Archaeological Assets of the Commonwealth.³ The project requires a Chapter 91 (c. 91) License from the Massachusetts Department of Environmental Protection (MassDEP). The project may require a National Pollutant Discharge Elimination System (NPDES) surface water discharge Permit. The project has received a grant from the Office of Coastal Zone Management (CZM) and it requires Federal Consistency Review by CZM. The project is subject to the MEPA GHG Policy and Protocol (GHG Policy).

The project requires review by the Massachusetts Historical Commission (MHC). The project will require review and approvals from the Town of Nahant, including an Order of Conditions from the Nahant Conservation Commission, or in the case of an appeal, a Superseding Order of Conditions from MassDEP. The project requires a NPDES Construction General Permit (CGP) from the U.S. Environmental Protection Agency (EPA). The project may require Pre-Construction Notification under Section 10 and Section 404 of the Army Corps of Engineers in accordance with the General Permits for Massachusetts.

Because the project includes Financial Assistance, MEPA jurisdiction is broad and extends to all aspects of the project that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations.

Review of the ENF

The ENF provided a description of existing and proposed conditions, conceptual project plans, an alternatives analysis and identified measures to avoid, minimize and mitigate environmental impacts.⁴ The CSI building will include 29,150 sf for educational/research programming; 16,850 sf for support areas including restrooms, walls and circulation; and 9,000 sf for mechanical systems within the building envelope.

³ The project exceeds additional wetlands and historical thresholds that were identified during MEPA review.

⁴ A Supplemental Memo to the ENF was submitted by the Proponent on July 9, 2019.

More than 500 comments were received on the project, including comments from Congressman Seth Moulton, Senator Brendan Crighton and Representative Peter Capano, the Massachusetts Lobstermen Association (MLA), the Conservation Law Foundation (CLF), MassAudubon, the Nahant Preservation Trust, the Nahant Board of Selectmen, the Nahant Conservation Commission, the Nahant Historic Commission and from Nahant residents. The majority of commenters express significant concern with siting the facility on East Point, including impacts to open space, wildlife and municipal infrastructure. Comments request additional analysis of alternatives; identify inconsistencies in the ENF; and indicate that efforts to improve resiliency of Canoe Beach should be reviewed as part of the project.

Alternatives Analysis

The ENF included an alternatives analysis for multiple components of the project including the CSI, seawater intake system, parking, and building cooling. Alternatives for the CSI included a Site Location Alternative, a No-Build Alternative, and three building massing alternatives including the Preferred Alternative. The ENF indicates that an alternative site was not considered because Northeastern purchased the property to create an oceanography and teaching center and the East Point location offers a unique learning environment. Specifically, it noted the two shelving beaches on the campus and the moderate to heavy surf during storm events that provides an opportunity to study high-energy littoral phenomena. A No-Build Alternative was dismissed because existing facilities could not support identified needs of the CSI program and would not include project benefits, such as an improved stormwater management system.

Alternative building massing for the CSI include Scheme A, Scheme B (Preferred Alternative) and Scheme C. Scheme A consists of a 60,000-sf building on the east side of the Murphy Bunker. A single floor would be constructed along the north-south ridge above the bunker. Approximately 33,000 sf would be located above the bunker. The ENF indicates that the siting would minimize its visibility to the residential neighborhood to the west and landscaping would limit visibility from Lodge Park; this Alternative would be closer to the coastal buffer zone than the Preferred Alternative. Scheme C consists of a 44,000-sf building located on the east and west side of the Murphy Bunker in a similar configuration as the Preferred Alternative. Approximately 28,650 sf of the building would be above the Murphy Bunker and a second 13,000-sf building would be constructed behind the Edwards Building. This alternative would reduce the footprint of the building on top of the bunker; however, the ENF indicates that the second building would impact the residential neighborhood along Shallow Cove Rd.

The Preferred Alternative (Scheme B) would entail approximately 37,000 sf of floor area in two buildings above and to the east of the Murphy Bunker. As described in the ENF, the Preferred Alternative does not extend into the coastal buffer zone and minimizes impacts to the east meadow.

The alternatives analysis considered a parking area to the east of the Murphy Bunker outside of the wetland and coastal buffer zone. The ENF indicates that this option was dismissed because it would likely be opposed by the community.

Stormwater management alternatives to the proposed underground storage (Preferred Alternative) include the incorporation of low impact development (LID) such as rain gardens and bioswales. These options were dismissed by the Proponent based on additional encroachment of the buffer zones and space constraints. The Proponent also considered an onsite combination chiller plant and cooling tower as an alternative to the geothermal wells; however, it was determined that this alternative would have additional noise and visual impacts.

Alternatives to the Seawater System included a No-Action Alternative, a Larger Seawater Intake System (EEA#15973), a Subsea Floor Intake System Alternative and a Directional Drilling Alternative. A No-Action Alternative was dismissed because biofouling of the intake system reduces the flow and requires that pumps be rebuilt or replaced frequently. Northeastern indicates that failure of the system would cause irreparable damage to research at the MSC. The larger system proposed in the prior ENF would operate at a flow of 2,400 gpm. This alternative was dismissed based on a reevaluation of seawater needs and concerns identified by the community. A Subsea Floor Intake System, commonly used for desalinization plants, was also considered. The system would consist of a well screen buried in subtidal gravel and sand. The buried intake would reduce intake velocities preventing larval entrapment. This alternative was dismissed based on the conditions at Bathing Beach, which are not conducive to burial, and because it would filter out planktonic organisms which are important to research.

The Preferred Alternative includes a subsea outfall and diffuser system to address concerns with erosion and temperature. The diffuser will gradually mix discharged seawater with receiving water to minimize potential temperature differentials.

Land Alteration

The ENF identifies 3.7 acres of land alteration and creation of an additional 1.3 acres of impervious area associated with building footprints, parking areas and grading.⁵ The ENF indicates that the bunker was selected as the site for the CSI building because it was previously disturbed. Project plans identify a footprint for the geothermal wellfield system. It is unclear the extent of which this area will be altered or if this alteration is included in impact calculations. The ENF did not identify the amount and location of cut and fill proposed for the site.

Waterways

The seawater system replacement requires a c. 91 License because it will be partially located within flowed tidelands. Comments from MassDEP's Waterways Program do not identify any substantive concerns and indicate that the project appears to be a water-dependent use pursuant to 310 CMR 9.12(2)(b)(13).

Wetlands

The project includes impacts to LUO, Coastal Bank, Land Containing Shellfish, and LSCSF. The Nahant Conservation Commission will review the project for its consistency with

⁵ The ENF also identifies an increase of 1.85 acres of impervious surface (page 5).

the Wetlands Protection Act, the Wetlands Regulations (310 CMR 10.00), and associated performance standards including the Stormwater Management Standards (SMS).

As indicated in the ENF and in comments from MassDEP, the Proponent has consulted with EPA and MassDEP to determine whether the seawater system requires a NPDES permit. To support a determination, the Proponent conducted mixing zone modeling and temperature and water quality sampling. The intake structures will consist of two slotted fiberglass cylinders with ½ inch plastic mesh designed to reduce slot entrance velocity and minimize entrapment of small organisms. Intake velocity modeling demonstrated that a 600 gpm flow rate would result in a capture velocity at the intake mesh of 0.011 feet/second (ft/sec). The ENF indicates that entrainment could result in the loss of 5 mature lobsters. Northeastern has proposed an on-site lobster hatchery to offset this impact by producing approximately 90,000 Stage IV lobster larvae per year which would equate to approximately 45 market sized lobsters.

A CORMIX model for the diffuser system used a theoretical discharge rate of 1,050 gpm and a temperature differential of +5.7 degrees Fahrenheit (F) relative to ambient waters. The model indicated that the seawater discharge would not have an adverse effect. As described in the ENF, the average calculated temperature differential for discharge over a 10-month study period was 0.367 °F, indicating that the effect would be less than that identified by modeling and that the diffuser will mitigate thermal effects. Comments from CZM and MassDEP note that the replacement system will be an improvement compared to existing conditions.

The Supplemental Memorandum included influent and effluent water quality data (collected in April 2019 on two different days at low tide, mid tide, and high tide) and analyzed the samples for parameters associated with effluent from facilities that hold aquatic animals (e.g., fish hatcheries), including biochemical oxygen demand (BOD, 5-day), Kjeldhal nitrogen, ammonia nitrogen, nitrate-N/nitrite-N, total nitrogen, oil and grease, total suspended solids, total phosphorus, dissolved oxygen, and pH.

The waters surrounding the project site are classified as Class SA by the Massachusetts State Water Quality Standards (SWQS) (314 CMR 4.00). Discharges to SA waters cannot exceed 85°F nor a maximum daily mean of 80°F and a rise in temperature due to a discharge cannot exceed 1.5°F (314 CMR 4.05(4)(a)(2)). The SWQS for SA waters (314 CMR 4.05(4)(a)) include numeric standards for dissolved oxygen, and pH, and indicate that SA water should be free from oil and grease and petrochemicals. BOD, Kjeldhal nitrogen, ammonia, and oil and grease were not detected in either the seawater intake or discharge. For parameters that were detected, values in the discharge are comparable to influent values. In many cases (e.g., nitrogen species, total phosphorus), the value of the discharge was lower or equal to the value of the intake. Dissolved oxygen and pH values at both locations consistently met water quality standards. The only increased parameter in the effluent was total suspended solids; however, concentrations were not considered significant.

The Supplemental Memorandum included a *Best Practices for Seawater Use* document developed by Northeastern's Seawater Advisory Committee (SAC). The document prohibits the addition of chemicals (including antibiotics, cleaning agents, and other chemicals) and invasive/non-native and potential injurious species into the return seawater. In addition, the plan

provides information and instructions regarding managing return seawater; returning animals to the wild; maintaining non-native species in closed tanks and requiring consultation with the Massachusetts Invasive Species Program (MISP); managing disposal of organisms in closed tanks landside to wastewater treatment plant or solid waste disposal; and filing a mandatory Emergency Spill Response Plan with the SAC.

Based on a review of the ENF, supplemental information and available sampling data, a preliminary assessment by MassDEP and EPA indicates that the proposed intake and discharge would not be a significant contributor of pollutants. This assessment is conditioned on maintaining the levels of biomass held at the facility under the threshold for a Concentrated Aquatic Animal Production (CAAP) Facility defined in the SWQS regulations at 314 CMR 3.16 Appendix A, 40 C.F.R. § 122.24, and 40 C.F.R. Part 122, Appendix C.⁶ The MassDEP comment letter indicates that Northeastern maintains that no more than 500 pounds of organisms are held at any one time at the MSC. The assessment assumes that the facility and system will be constructed and continue to be operated as described in the ENF.

Drainage

Under existing conditions, the site includes minimal drainage infrastructure. Stormwater runoff from some roof areas is collected and piped to a small closed drainage system that discharges through a 15-inch pipe to Bathing Beach. The project includes installation of a new stormwater management system to address changes in runoff and increased impervious surfaces. Deep sump catch basins are proposed to provide pretreatment to runoff from the northern parking lot and site driveway. Runoff will be collected, treated and infiltrated using Stormtech Infiltration Chambers. A bioretention basin is proposed at the southern parking lot to collect and treat stormwater.

Rare Species

Many comments identify concerns with impacts to wildlife habitat and birds within the project area. Comments from NHESP confirm that the subject property is *not* delineated as Priority Habitat for State-listed Species, according to the Massachusetts Natural Heritage Atlas (14th Edition). Proposed projects and activities are only subject to review under the MA Endangered Species Act Regulations (321 CMR 10.00) if a project site is delineated as Priority Habitat, except as provided in 321 CMR 10.13.

The Division may delineate a new Priority Habitat, and require review pursuant to MESA, if the Division receives new information on a State-listed Endangered or Threatened Species occurrence (note: not Special Concern) that “meets the criteria for delineation of a Priority Habitat” (321 CMR 10.12). NHESP indicates that no information submitted to date meets the criteria for the delineation of Priority Habitat on the property. For projects not delineated as Priority Habitat but otherwise subject to review by the MEPA Office, the Division

⁶ A facility is considered a CAAP if it produces at least 20,000 pounds of cold water aquatic animals per year and feeds more than 5,000 pounds of feed during the calendar month of maximum feeding, or if it produces at least 100,000 pound of warm water fish per year, or if the permitting authority designates a facility on a case-by-case basis upon determining that it is a “significant contributor of pollutants.”

may request surveys for an Endangered or Threatened State-listed Species during the MEPA review process. NHESP indicates that, based on its review of information submitted to date, including the vegetative community types located on the property, it will not request surveys through MEPA review pursuant to 321 CMR 10.13(1)(b).

Conclusion

The purpose of MEPA is to provide meaningful opportunities for public review of the potential environmental impacts of projects for which Agency Action is required, and to assist each Agency in using (in addition to applying any other applicable statutory and regulatory standards and requirements) 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. I note that many comments request that the project be denied. MEPA is not a permitting process and I do not have the authority to approve or deny a project.

Based on a review of the ENF, consultation with State Agencies, and a review of comment letters, I have determined that an EIR is necessary to provide meaningful public review of the proposed project and its environmental impacts. The DEIR should be prepared in accordance with the Scope included below. The Scope includes, but is not limited to, additional alternatives analysis; revised delineation of wetland resources, impacts and mitigation; and identification and analysis of historic resources, impacts and mitigation.

SCOPE

General

The DEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope. It 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 evaluate the vulnerabilities of the site to the effects of climate change and address measures to improve the resiliency of the site and the project to these effects, including analysis of shore protection measures for Canoe Beach. The DEIR should identify, describe, and assess the environmental impacts of any changes in the project that have occurred between the preparation of the ENF and DEIR. The DEIR should include updated site plans for existing and post-development conditions at a legible scale.

The DEIR should provide a brief description and analysis of applicable statutory and regulatory standards and requirements, and describe how the project will meet those standards. It should include a list of required State Permits, Financial Assistance, or other State approvals and provide an update on the status of each of these pending actions. The DEIR should include an update on local, regional or federal permitting as applicable. The DEIR should describe the project's consistency with state and local planning.

Alternatives Analysis

As noted above, the objective of the MEPA review process is to support analysis of the environmental impacts of a project and measures to avoid, minimize and/or mitigate Damage to the Environment to the maximum extent practicable within the context of the project purpose and goals. Alternatives analyses are required to consider what effect changing the parameters and/or siting of a project, or components thereof, will have on the environment.

The DEIR should identify the project purpose and criteria by which the Proponent evaluates alternatives. In addition to the alternatives identified in the ENF, the DEIR must include an analysis of a Reduced Build Alternative (i.e. reduced land alteration, impervious area, etc.) and an alternative that avoids, minimizes and mitigates impacts to historic resources, including the Murphy Bunker, and other archaeologically sensitive areas. For each alternative, including those identified in the ENF, the DEIR should identify and compare impacts on land alteration, creation of impervious area, wetland resource areas, traffic generation, parking, water use, and wastewater for each alternative. This comparison should be provided in the narrative and in a tabular format.

The DEIR should address how the design modification or the addition of features to the Preferred Alternative could further minimize and mitigate potential impacts. Additional recommendations provided in this Certificate may result in a modified design that enhances the ability to avoid, minimize, and/or mitigate Damage to the Environment. The DEIR should discuss steps the Proponent will take to further reduce the impacts of the project since the filing of the ENF, or, if certain measures are infeasible, the DEIR should discuss why these measures will not be adopted.

I note the significant concerns expressed by many commenters regarding clearing of a portion of the project site by the Proponent to provide access for site investigations. Exploratory field work and associated permitting necessary to evaluate a project for purposes of MEPA or other environmental statutes and regulations (e.g. soil testing, test pits, conducting a pump test on a well) can proceed prior to the completion of MEPA review, as can maintenance of existing facilities and infrastructure. However, significant activity and clearing must be avoided to the extent practicable to avoid eliminating alternatives that could avoid or minimize project impacts.

Because the alternatives analysis and measures to avoid impacts, including land alteration, are essential to the spirit and intent of MEPA review, the Proponent should consult with the MEPA Office and local and state permitting agencies prior to any additional site work or clearing that is proposed. The consultation should include identification of the purpose and need of the work and a demonstration that the work will be minimized to the extent practical. Alternatives analysis and identification of measures to avoid and minimize impacts should be assessed as though these impacts have not occurred. I will not accept an assessment that an alternative has less impact because it is proposed within the area that was altered for site investigations.

Land Alteration

The DEIR should quantify the total amount of alteration associated with the proposed project including areas to be altered for buildings, roadways, wastewater, water and stormwater infrastructure, landscaping, and other project components. The DEIR should clarify the location, type and amount of alteration in previously undisturbed areas. The DEIR should include site plans that clearly identify and delineate areas proposed for development and those that will not be altered or disturbed. Impacts associated with the geothermal wellfield should be identified in the narrative and on project plans. The DEIR should clearly identify ownership and land uses of adjacent parcels and identify any land protected by Article 97 of the Amendments to the Constitution of the Commonwealth of Massachusetts (Article 97). The DEIR should address comments from the Nahant Preservation Trust which assert that the project site includes land protected by Article 97. The DEIR should identify the public access easement located on the project site. Temporary and permanent impacts to open space should be identified, including impacts associated with the construction period.

The DEIR should provide a comprehensive evaluation of all measures to reduce the amount of land alteration and creation of impervious areas. Measures to reduce land alteration and creation of impervious area include: reductions in building program, increased density to minimize project footprint, reduced roadway widths and parking areas; use of pervious pavement for roadways and/or sidewalks; land banking of parking until warranted by demand; and supplemental landscaping or tree planting to mitigate impacts associated with clearing.

The DEIR should identify open space that will remain undisturbed and/or restored upon completion of construction. The DEIR should consider placing a conservation restriction on a portion(s) of the site designated as open space, including areas containing wetlands, to ensure their permanent protection. The DEIR should identify any impacts of the project design or construction on the access easement to Lodge Park.

The DEIR should provide plans that clearly identify proposed areas of cut and fill and areas that may require blasting. The DEIR should provide estimates of cut and fill volumes to achieve proposed site grades. If blasting is required, it should clarify whether blast materials will be processed on-site, and if so; should provide plans that identify the locations where this will occur.

The DEIR should provide details on the location of invasive species management, propose methods and techniques, and describe how habitat restoration work will be implemented, including replanting plans.

Wetlands and Waterways

The DEIR should include plans at a reasonable scale that depict the extent of all regulated resources on the site, and the extent and location of all proposed impacts to each. Resource areas should be clearly identified on project plans. The limit of the FEMA AE zone (elevation 13 NAVD88) should be located at the elevation 13 contour on the plan. The DEIR should include

updated plans at a legible scale and ensure that the narrative, plans and attachments are consistent or that any discrepancies are identified and explained.

The DEIR should demonstrate that the project design minimizes impervious surfaces and incorporates low impact development strategies to the maximum extent feasible to improve the function of the floodplain.

As requested by MassDEP, more information on the design and operation of the proposed drum filters should be included in the DEIR, including the constituents in the discharge of filter backwash. Depending on the constituents, the discharge of filter backwash may be considered an addition of a pollutant to the receiving water. MassDEP requests that Northeastern provide more information on sources of temperature increases and that the CORMIX model be rerun using the maximum delta T. The DEIR should include a commitment to conduct additional temperature sampling and CORMIX model runs once the replacement seawater system is operational.

The DEIR should provide details demonstrating that the facility will remain below the CAAP thresholds even with the proposed lobster hatchery. EPA recommends a standard intake velocity no greater than 0.5 fps to ensure that the majority of aquatic organisms can avoid becoming trapped against intake screens. Northeastern has indicated that the average calculated velocity at the screen mesh of the proposed intake is below the 0.5 fps standard. The DEIR should include commitments to verify these velocities upon operation of the seawater system.

The Proponent should consult with the Massachusetts Division of Marine Fisheries regarding the lobster hatchery design and information that should be included in the DEIR to support its review.

The DEIR should include an updated *Best Practices for Seawater Use* document and describe any changes to the document since the ENF was submitted. It should identify any additional consultation with the MISP.

Drainage

The DEIR should evaluate use of LID techniques for stormwater management, including but not limited to: use of pervious pavement, raingardens/bioretenion areas, bioswales, tree box filters, and green roofs, and reuse of roof runoff for irrigation. The DEIR should identify LID measures that will be incorporated into project design and explain, in reasonable detail why certain measures, which could promote infiltration while reducing impervious surface and land disturbance, were not included.

Historic and Cultural Resources

The project will include impacts to historic resources and may include impacts to archaeological resources. Comments submitted by MHC indicate that the project will have an "adverse effect" on the Fort Ruckman North (NAH.935) and South Batteries (aka Murphy Bunker) (NAH.910) which are listed on MHC's Inventory and are eligible for listing in the National Register of Historic Places. MHC comments indicate that the CSI structure will include

partial demolition of the Murphy Bunker and burial of portions of the Murphy Bunker and North Battery.

Portions of the project impact area including the proposed wellfield are archaeologically sensitive and may contain significant archaeological resources associated with the World War II military base, earlier historic occupations and ancient Native American occupation of Nahant. MHC has requested that the Proponent conduct an intensive locational archaeological survey within the project impact area to identify potential for archaeological resources.

To support review by MHC, the DEIR should include a detailed narrative and plans of existing and proposed conditions (no larger than 11'x17') for the project, identify and describe historic resources, project alternatives and identify measures to avoid, minimize and mitigate impacts to these resources. The Proponent should consult with MHC regarding information that can be presented in the DEIR regarding archaeological resources.

Climate Change

Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth (EO 569) was issued on September 16, 2016. EO 569 recognizes the serious threat presented by climate change and directs state agencies to develop and implement an integrated strategy that leverages state resources to combat climate change and prepare for its impacts. The Order seeks to ensure that Massachusetts will meet GHG emissions reduction limits established under the Global Warming Solution Act of 2008 (GWSA) and will work to prepare state government and cities and towns for the impacts of climate change. As noted in the Scope, the DEIR should address the potential effects of climate change on the project site.

The GHG Policy and requirements to analyze the effects of climate change through EIR review is an important part of this statewide strategy. These analyses advance proponents' understanding of a project's contribution and vulnerability to climate change. The Proponent should consider cross-cutting measures such as incorporation of renewables and inclusion of LID measures in site design, which can improve the project's resiliency, reduce GHG emissions and conserve and sustainably employ the natural resources of the Commonwealth.

Greenhouse Gas Emissions

The project is subject to review under the May 5, 2010 MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol (Policy). The DEIR should include an analysis of GHG emissions and mitigation measures in accordance with the standard requirements of the Policy, which requires projects to quantify carbon dioxide (CO₂) emissions and identify measures to avoid, minimize or mitigate these emissions. The analysis should quantify the CO₂ emissions associated with building energy use (direct and indirect stationary sources). The DEIR should identify and commit to measures to reduce GHG emissions. The Proponent should refer to the Policy for additional guidance on the GHG analysis.

The MEPA staff and the Department of Energy Resources (DOER) staff are available to assist with these efforts. The Proponent should consult with them regarding the analysis prior to submission of the DEIR.

Stationary Sources

The DEIR should include a GHG analysis that calculates and compares GHG emissions associated with 1) a Base Case corresponding to the 9th Edition of the Massachusetts Building Code; and 2) a Preferred Alternative that achieves greater reductions in energy use and GHG emissions than required by the Building Code. The 9th edition of the Building Code references the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) 90.1-2013 and the International Energy Conservation Code (IECC) 2015. The GHG analysis should model energy use, GHG emissions, and mitigation measures associated with the project in accordance with the GHG Policy and comments from the Department of Energy Resources (DOER). The Proponent should consult with DOER and the MEPA Office regarding the modeling approach prior to submitting the DEIR.

The GHG analysis should clearly demonstrate consistency with the objectives of MEPA review, one of which is to document the means by which Damage to the Environment can be avoided, minimized, and mitigated to the maximum extent feasible. The Proponent should identify the model used to analyze GHG emissions, clearly state modeling assumptions for each project element, explicitly note the GHG reduction measures have been modeled, and identify whether certain building design or operational GHG reduction measures will be mandated by the Proponent to future occupants or merely encouraged for adoption and implementation. The DEIR should include the modeling printout for each alternative and emission tables that compare base case emissions in tons per year (tpy) with the Preferred Alternative showing the anticipated reduction in tpy and percentage by emissions source (direct, indirect and transportation). This information should be provided in a format consistent with the example table provided in the DOER comment letter. Other tables and graphs may be included to convey the GHG emissions and potential reductions associated with various mitigation measures as necessary.

The DEIR should explain, in reasonable detail, why certain measures that could provide significant GHG reductions were not selected – either because they would not be applicable to the project or are deemed technically or financially infeasible. The following measures should be prioritized for evaluation:

- Electrification of space and water heating with heat pump/VRF systems in all buildings.
- Maintaining envelope integrity with framed, insulated walls with continuous insulation in all buildings.
- Avoidance of glass curtain wall assemblies and excessive windows in all buildings.
- Incorporation of energy recovery in all buildings.
- Use of LED lighting in all buildings.

- Planning to preserve space for rooftop solar PV and incorporation of solar PV on rooftops.

The geothermal system has the potential to significantly reduce GHG emissions. The DEIR should provide a detailed description and analysis of the geothermal heating and cooling system and potential benefits, including reductions in GHG emissions and improved resiliency.

Adaptation and Resiliency

The DEIR should provide an analysis and discussion of vulnerabilities of the site to the potential effects associated with climate change. To assist in this evaluation, the Proponent should review the 2018 Massachusetts State Hazard Mitigation and Climate Adaptation Plan at <http://www.resilientma.org> and review data available through the Climate Change Clearinghouse for the Commonwealth. (<https://www.mass.gov/files/documents/2018/10/26/SHMCAP-September2018-Full-Plan-web.pdf>)

The DEIR should assess the vulnerability of the site to sea level rise, and more frequent and intense storms and increased temperatures. It should assess alternatives to improve the resiliency of the site and project elements, including vehicular access and infrastructure, to these effects. The DEIR should evaluate whether the access drive can be relocated outside of the velocity zone and associated benefits, such as improved public safety or reduced maintenance costs.

The DEIR should evaluate incorporation of LID into the stormwater management plan, including flood storage, and further reductions in land alteration and impervious area. In addition, the DEIR should evaluate measures to minimize flood intrusion; ground floor use limitations; elevation of infrastructure, electrical and communication equipment; use of water-resistant materials for structural elements below BFE; emergency power sources, and essential personal safety measures. The analysis provided in the DEIR should demonstrate that the project would not exacerbate flooding of adjacent uses and properties.

Construction Period Impacts

The DEIR should identify the anticipated build-out period of the project as a whole and describe potential project sequencing and staging. It should identify construction schedule and work hours. It should address how access to Lodge Park will be maintained during the construction period. The DEIR should include a draft Construction Management Plan (CMP) that identifies BMPs for erosion and sedimentation controls, construction staging areas, traffic management, and air/noise pollution.

Based on potential for extensive earth movement on-site to achieve final grades for the various development pads, the DEIR should identify measures to stabilize cleared areas and slopes throughout the site if construction in these individual building locations is not imminent subsequent to earth movement activities. The draft CMP should include appropriate erosion and sedimentation control BMPs. If blasting is required, the Proponent should commit to using

blasting materials that do not contain perchlorate to avoid impacts to water quality and wetlands. The DEIR should address potential noise and vibration impacts associated with blasting and identify appropriate mitigation measures. The DEIR should discuss specific BMPs to ensure that all drilling and/or blasting will be completed in accordance with local and State regulations.

The DEIR should identify and describe proposed construction truck traffic routes to and from the site and provide an estimate of the number of vehicle trips that will be generated during earthwork activities and the construction period. The DEIR should provide information on the emission controls that will be used for all on-site construction vehicles in an effort to minimize construction vehicle emissions. The DEIR should provide a discussion on using construction equipment with engines manufactured to Tier 4 federal emission standards or best available control technology (BACT). I remind the Proponent that Ultra Low Sulfur Diesel (ULSD) fuel be used in all off-road construction equipment. The DEIR should confirm that the project will require its construction contractors to use ULSD fuel in off-road equipment and indicate whether it will incorporate additional measures to minimize construction-period emissions. The DEIR should also address how the project will ensure compliance with the Massachusetts Idling regulation at 310 CMR 7.11.

The DEIR should provide more information regarding the project's generation, handling, recycling, and disposal of construction and demolition (C&D) debris. The DEIR should discuss the solid waste and air quality regulatory requirements identified in the MassDEP comment letter and identify specific and aggressive construction recycling and source reduction goals to increase the sustainability of the project. The project must comply with MassDEP's Solid Waste and Air Pollution Control regulations, pursuant to M.G.L. c.40, §54.

Mitigation and Draft Section 61 Findings

The DEIR should include a section that summarizes proposed mitigation measures and provides draft Section 61 Findings for each Agency Action. It should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation.

To ensure that all GHG emissions reduction measures adopted by the Proponent as the Preferred Alternative are actually constructed or performed by the Proponent, the Secretary requires proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings included in the DEIR.

Responses to Comments

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 direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended, and shall not be construed, to enlarge the scope of the DEIR beyond what has been expressly identified in this Certificate.

Circulation

The Proponent should circulate the DEIR to those parties who commented on the ENF, to any State and municipal agencies from which the Proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations. The Proponent may circulate copies of the DEIR to commenters other than State Agencies in a digital format (e.g., CD-ROM, USB drive) or post to an online website. However, the Proponent should make available a reasonable number of hard copies to accommodate those without convenient access to a computer to be distributed upon request on a first come, first served basis. The Proponent should send a letter accompanying the digital copy or identifying the web address of the online version of the DEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. The DEIR submitted to the MEPA office should include a digital copy of the complete document. A copy of the DEIR should be made available for review in the Nahant public library.

August 2, 2019

Date

Kathleen A. Theoharides

Comments received:

6/12/2019 Christian Bauta
6/12/2019 Erin DiLisio (1)
6/13/2019 Annie Wachtel
6/13/2019 Elizabeth Stubbs (1)
6/13/2019 Jennifer McCarthy
6/13/2019 Owen Russel
6/13/2019 Rachel McCarthy
6/14/2019 Bay Bauta
6/17/2019 Barry Sidwell
6/17/2019 Diane Montieth (1)
6/18/2019 Board of Underwater Archaeological Resources (BUAR)
6/18/2019 Linda Mason
6/18/2019 Nikki Clinton
6/18/2019 Patrick O'Reilly
6/18/2019 Paul & Elin Babin
6/18/2019 Susanne Macarelli
6/19/2019 Anonymous
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7/4/2019 Elizabeth Berman (8)
7/7/2019 David Carter
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7/10/2019 James Conlin
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Regulations Program (WRP)
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7/23/2019 Anne Whiston Spirn
7/23/2019 Bob Durand
7/23/2019 Carolyn Whipple Fraser
7/23/2019 Daniel M. Berman
7/23/2019 Division of Marine Fisheries (DMF)
7/23/2019 Elizabeth Berman (10)
7/23/2019 Gary Prochorchik
7/23/2019 Jeffrey L. Musman
7/23/2019 Lynne Spencer
7/23/2019 Massachusetts Department of Environmental Protection (MassDEP) Northeast
Regional Office (NERO)
7/23/2019 MassAudubon
7/23/2019 Nahant Board of Selectmen
7/23/2019 Nahant Conservation Commission
7/23/2019 Lurie Friedman, LLP on behalf of Nahant Preservation Trust (NPT)
7/23/2019 Paula Devereaux
7/23/2019 Nicole Rosa
7/23/2019 Coastal Zone Management (CZM)
7/23/2019 Paul Spirn (1)
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7/26/2019 Nick Bokron
7/29/2019 Jean Walsh
7/29/2019 Lydia Antrim
7/29/2019 Sue Jolian
7/29/2019 Lauren Prescott
7/29/2019 Deirdre Pocak
7/29/2019 Lurie Friedman, LLP on behalf of NPT (2)
7/31/2019 Lurie Friedman, LLP on behalf of NPT (3)
7/29/2019 26 Illegible signatures
7/31/2019 Natural Heritage and Endangered Species Program (NHESP)
8/2/2019 Joanna Post

KAT/EFF/eff