

RELEASE ABATEMENT MEASURE STATUS REPORT NO. 21

**129 COMMERCIAL STREET
MALDEN, MASSACHUSETTS**

RELEASE TRACKING NUMBER 3-0362
October 2008

Prepared For:

nationalgrid

National Grid
25 Research Drive
Westborough, MA 01582

Prepared By:



Innovative Engineering Solutions, Inc.
25 Spring Street
Walpole, Massachusetts 02081
(508) 668-0033

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Project Reviewer

Release Abatement Measure Status Report No. 21

**129 Commercial Street
Malden, Massachusetts 02148
DEP Release Tracking Number: 3-0362**

This Release Abatement Measure (RAM) Status Report has been prepared by Innovative Engineering Solutions, Inc. (IESI) on behalf of Massachusetts Electric Company d/b/a/ National Grid in accordance with the requirements of the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000). This RAM is being conducted at the 129 Commercial Street portion (Parcel B) of the former Malden manufactured gas plant (MGP) site (the "Site") in Malden, Massachusetts. The 129 Commercial Street property is currently occupied by a commercial bakery and is bounded to the north by Charles Street, to the east by Commercial Street, to the south by Adams Street, and to the west by the MBTA Orange Line commuter railway. The Massachusetts Department of Environmental Protection (DEP) assigned Release Tracking Number (RTN) 3-0362 to the Malden MGP Site. Figure 1 depicts the site locus and Figure 2 depicts the location of the property in relation to the disposal site boundary of the former MGP.

This RAM was initiated to address the potential migration of volatile organic compounds (VOCs) to indoor air at 129 Commercial Street. Although VOCs were historically detected in indoor air in the building at 129 Commercial Street, the detected concentrations did not constitute an imminent hazard for workers in the building, and were less than applicable occupational standards set by the US Occupational Safety and Health Administration (OSHA). However, remedial actions were implemented to reduce potential migration of VOCs to indoor air.

As indicated in the RAM Plan that was submitted to the DEP on July 2, 1998, the objective of the RAM was to reduce VOC concentrations in indoor air; this was initially attempted by sealing portions of the floor slab. The sealing of the floor was not completely successful in reducing indoor air concentrations, and the RAM was modified in April 1999 to include the installation of a sub-slab venting system (SSVS). The SSVS was installed in October 1999 and consists of five 2-inch diameter soil vapor extraction points installed horizontally through the foundation wall beneath the floor slab. The vapor extraction points extend approximately 5 feet beneath the building. These points are connected to a regenerative blower that removes vapors from beneath the floor slab and directs them through two granular activated carbon (GAC) drums (capacity of approximately 200 pounds each) for treatment. The blower and carbon drums are stored in a temporary building located east of the building along Commercial Street. Treated vapors are emitted through a 4-inch diameter vent pipe to the atmosphere. Figure 3 presents the locations of the extraction points and the system enclosure.

The content of this report has been structured to address the specific information requirements set forth in 310 CMR 40.0445 (2)(a) through (e). This report was submitted electronically to the DEP via the eDEP website; a copy of the RAM Transmittal Form (BWSC-106) is included in Appendix A. In addition, in accordance with DEP requirements, the Remedial Monitoring Report (RMR; forms BWSC-106 A/B) was submitted electronically via the eDEP website; a copy of the RMR is included in Appendix A. This RAM Status Report details on-going operation and maintenance of the sub-slab venting system, and summarizes monitoring data collected from April 1, 2008 through September 30, 2008.

310 CMR 40.0445 (2)(a) The status of response operations:

The SSVS is monitored monthly as part of an ongoing operation and maintenance (O&M) schedule. Total VOC levels in influent and effluent vapor from the off-gas control device (sub-slab venting treatment unit) are measured during these visits with a photoionization detector (PID) calibrated to a 100 parts per million (ppm) isobutylene standard to respond as benzene. The results are summarized in Table 1 and discussed below.

On April 10, 2008, the existing 3 horsepower regenerative blower and GAC drum were replaced with a 2 horsepower regenerative blower and two vapor phase GAC drums, each containing approximately 200 pounds of GAC.

On April 16, 2008, indoor air samples were collected from five locations (identified as Site 4 through Site 8) inside the 129 Commercial Street building, one location (identified as Site 2) outside the 129 Commercial Street building and from the influent (identified as Sys-Inf) to the SSVS. The sample collected at Site 2 represents background conditions (i.e. outside air). A duplicate sample was collected at Site 7. A sample was not collected from Site 11 because one of the canisters shipped from the laboratory was not under vacuum and was unable to be used. The sample locations are shown on Figure 3.

The samples were collected in laboratory provided 6 liter summa canisters. Each canister was outfitted with a laboratory calibrated flow control valve to allow an 8-hour sample collection rate. The canisters were placed in the sample locations, the valve opened, and the sample was collected for approximately 6 to 8 hours. Upon completion of the collection period, the canisters were retrieved and submitted under chain of custody to Columbia Analytical Services of Simi Valley, California for analysis of Air Phase Hydrocarbons (APH) via the DEP Method and styrene via EPA Method TO-15. The results are summarized in Table 2 and further discussed below.

310 CMR 40.0445 (2)(b) Any significant new site information or data:

SSVS data

O&M visits have been conducted regularly throughout the reporting period. The monitoring data collected during this period are summarized on Table 1 and discussed below.

Vacuum conditions are monitored with fixed vacuum gauges on the influent piping prior to the blower and on the knockout drum. A portable vacuum gauge is used to periodically measure vacuum at the individual extraction points (EP-1 through EP-5). During this reporting period, vacuum at extraction points EP-1 through EP-5 ranged from 0.1 inch to 2.0 inches of water; vacuum at the blower ranged from 8.7 inches to 10 inches of water; vacuum at the knockout drum ranged from 4.1 inches and 6.5 inches of water; and discharge pressure ranged from 15 inches and 17 inches of water during this period. These measurements are generally consistent with other recent vacuum data for this system (and other similar systems), except for the discharge pressure, which was elevated. After reducing the size of the blower and replacing the GAC drums, the backpressure was greatly reduced and the airflow through the system was increased.

VOC levels are screened with a PID at 3 locations along the vapor stream: Influent (pre-GAC), Effluent-1 (post-GAC vessel 1) and Effluent-2 (post-GAC vessel 2). PID readings at the influent were consistent with background levels (0.0 ppm) as measured throughout the reporting period. PID readings at Effluent-1 and Effluent-2 were also consistent with background levels (0.0 ppm) throughout the reporting period.

Air flow in and out of the system is measured with an air velocity meter. During this reporting period, the influent air flow rate ranged from 89 cubic feet per minute (cfm, not adjusted for temperature and pressure) to 113 cfm; the effluent flow rate ranged from 88.5 cfm to 98 cfm. Note that the air flow rate has nearly doubled since the blower and GAC were replaced.

Indoor Air Sampling Data

Table 2 presents a summary of the results of laboratory analysis conducted on the air samples collected on April 16, 2008, as well as the results from previous sampling events. The complete laboratory data report for the air samples is included as Appendix B. For this sampling round, the air samples were analyzed for APH by the DEP Method and styrene (by EPA Method TO-15); for prior sampling rounds, the air samples were analyzed for VOCs by EPA Method TO-15. Note that APH analysis includes 8 VOCs (benzene, ethylbenzene, toluene, naphthalene, xylenes,

3-butadiene, methyl tert-butyl ether, and 2-methylnaphthalene), and three APH fractions (C₅ to C₈ aliphatics, C₉ to C₁₂ aliphatics, and C₉ to C₁₀ aromatics). The VOCs 3-butadiene, methyl tert-butyl ether, and 2-methylnaphthalene and the APH fractions are not included in the EPA Method TO-15 compound list; and this sampling event is the first time these compounds have been analyzed for. In addition, the APH analysis does not include styrene, which has been detected in the previous sampling events; therefore, we included analysis for this compound by EPA Method TO-15.

The results of the analysis indicate that the concentrations of the VOCs were comparable to previous events. Of the additional APH analytes, only the fractions C₅ to C₈ aliphatics, C₉ to C₁₂ aliphatics were detected. Similar to previous sampling events, the sample collected from Site 8 had elevated detection limits which have been attributed to ethanol interference from the fermentation process at the bakery. The elevated detection limits were not observed at Sites 6 and 7 as they have been in the past.

The total concentration of APH compounds in the Sys-Inf sample (which was collected prior to treatment of the vapors by GAC) was 797.4 ug/m³ or roughly 0.7 ppm.

Risk Characterization Update

The Risk Characterization included in the Phase III Remedial Action Plan (Haley & Aldrich, 2003) reports a condition of No Significant Risk for workers inside the building at 129 Commercial Street. The only current exposure pathway for these workers is the inhalation of indoor air. The data used for the Risk Characterization included indoor air data collected while the SSVS was operational and it was assumed in the Class C Response Action Outcome (Haley & Aldrich, 2005) that the SSVS remain operational to maintain a condition of No Significant Risk.

IESI updated the human health risk characterization for these workers using the data collected since 2004 (including the most recent sampling event). In order to streamline this effort, IESI used the formulas and data assumptions from the DEP "Short Forms for Human Health Risk Assessment under the MCP" updated as of February 2007. Table 3 presents the data and risk assumptions used.

The exposure point concentrations (EPCs) for each of the compounds (identified as "[OHM]_{air}" on Table 3) were calculated using an average of all the detected concentrations for samples collected inside the building from February 2004 through April 2008. Sample results that were below the detection limits were not included in the EPC. For ease of reference, various statistics for the sample dataset (i.e., the number of detections, the number of samples, the maximum detected concentration, minimum detected concentration and median detected concentration) are also included on Table 3.

We considered 2 separate exposure scenarios for inhalation of the indoor air. The first scenario was based on the exposure assumptions for a residential occupant, and the DEP standard "short form" exposure parameters used in the updated risk characterization were not adjusted. The second scenario was based on the exposure assumptions for a worker/commercial occupant, and the Exposure Frequency (EF) and the Exposure Duration (ED) values were modified accordingly. The EF value, which is typically 1 and represents an exposure frequency of 24 hours per day, was adjusted to 0.33 to represent a daily 8 hour shift for the employees (i.e., 8 hours per shift divided by 24 hours per day). The ED value, which is typically 1 and represents 7 days per week of exposure, was adjusted to 0.71 to represent 5 days of exposure per week (i.e., 5 divided by 7).

The Estimated Lifetime Cancer Risk (ELCR) for the residential exposure scenario was calculated to be 8E-06; the ELCR for the worker scenario was calculated to be 2E-06. These calculated ELCRs are both below the MCP limit of 1E-05. The Hazard Index (HI) for the residential exposure scenario was calculated to be 0.8; the HI for the worker scenario was calculated to be 0.2. Both calculated HI values are both below the MCP limit of 1.

IESI also compared the 90th Upper Percentile Value (UPV) of Typical Indoor Air Concentrations presented in the Draft DEP Policy Entitled "Typical Indoor Air Concentrations - Technical Update Policy #08-XXX" to the EPCs and to the maximum detected concentrations. According to the Draft DEP Policy,

“This document updates MassDEP’s list of values representing chemical concentrations that may typically be present in indoor air from sources such as building materials, household products, and ambient air. These “Typical Indoor Air Concentrations,” developed using recent studies of indoor air chemical concentrations measured in residences, may be used as one line of evidence in evaluating potential vapor intrusion pathways from a disposal site.”

The EPC for only one compound, styrene, exceeds the Draft 90th UPV values typical of *residential* indoor air. Also, the maximum detected concentrations for only 2 compounds, styrene and toluene, exceeds the Draft 90th UPV values typical of *residential* indoor air. Note that styrene has only been detected twice in 70 samples, and has not been detected since 2005, and that the concentration of toluene has exceeded the Draft 90th UPV value on only two occasions, both in 2004. The purpose of this comparison to residential values is to provide further evidence of the very low concentrations of VOCs in indoor air.

310 CMR 40.0445 (2)(c) Details of and/or plans for the management of Remediation Waste, Remedial Wastewater, and/or Remedial Additives:

One drum (approximately 200 pounds) of GAC was removed from the site under a Uniform Hazardous Waste Manifest on April 10, 2008. No other remediation waste was generated or disposed of during this reporting period. Approximately 7,955 pounds of spent carbon have been removed from the site since start-up of the sub-slab ventilation system in 1999.

310 CMR 40.0445 (2)(d) Any other information that the Department during its review and evaluation of a Status Report determines to be necessary to complete said Status Report, in view of site specific circumstances and conditions; and:

The DEP has not required any additional information

310 CMR 40.0445 (2)(e) An LSP Opinion as to whether the Release Abatement Measure is being conducted in conformance with the RAM Plan and any conditions of approval established by the Department.

Having reviewed the requirements of the RAM Plan and the response actions completed to date, we are of the opinion that the RAM is being conducted in accordance with the RAM Plan and the DEP Conditional Approval letters dated June 19, 1999 and July 27, 1999. DEP approval was necessary because at that time there was an ongoing Immediate Response Action (IRA) at the 100 Commercial Street property which is separate from the 129 Commercial Street property but part of larger Site RTN 3-0362. There are currently no ongoing IRAs at this location.

If you require additional information or have any questions regarding this status report, please contact Michael S. Lotti, LSP of IESI at (508) 668-0033 (x 231).

FIGURES



Innovative Engineering Solutions, Inc.
25 SPRING STREET
WALPOLE, MASSACHUSETTS 02081
(508) 668-0033

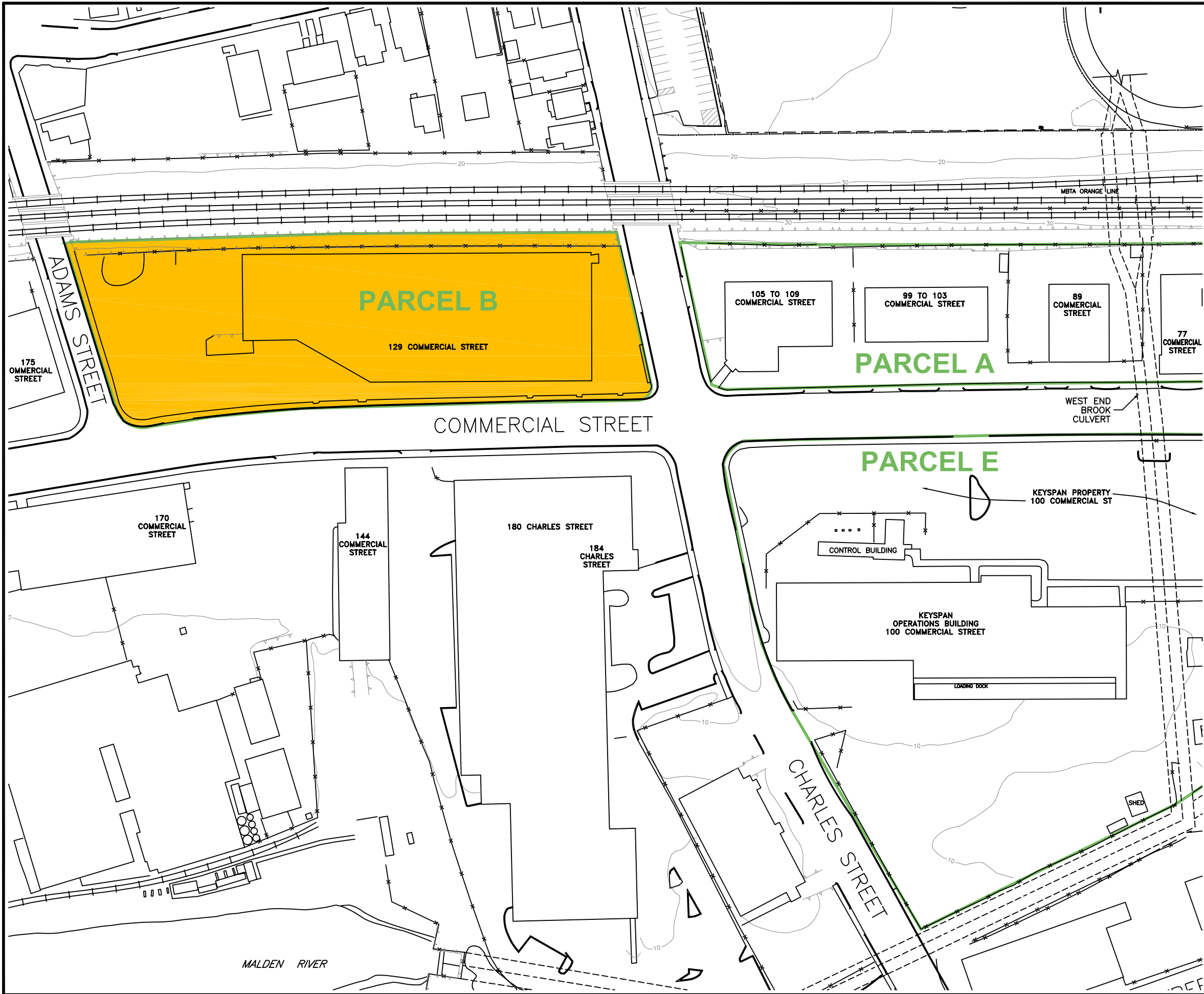
0 2000

SCALE IN FEET
1:24000

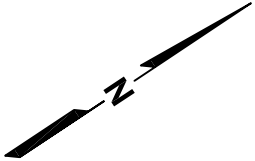
SITE LAT/LONG: 42°25'30"N 71°04'30"W
UTM: 329,298E 4,699,051N ZONE 19
USGS Topographic Map:
Boston North, Massachusetts 1991

FIGURE 1
SITE LOCATION MAP

Former Malden MGP Site
Malden, Massachusetts



 RAM AREA



0 50' 100' 200'
SCALE IN FEET

THIS PLAN BASED ON THE SITE PLAN DATED DECEMBER 2001
BY HALEY & ALDRICH, INC.

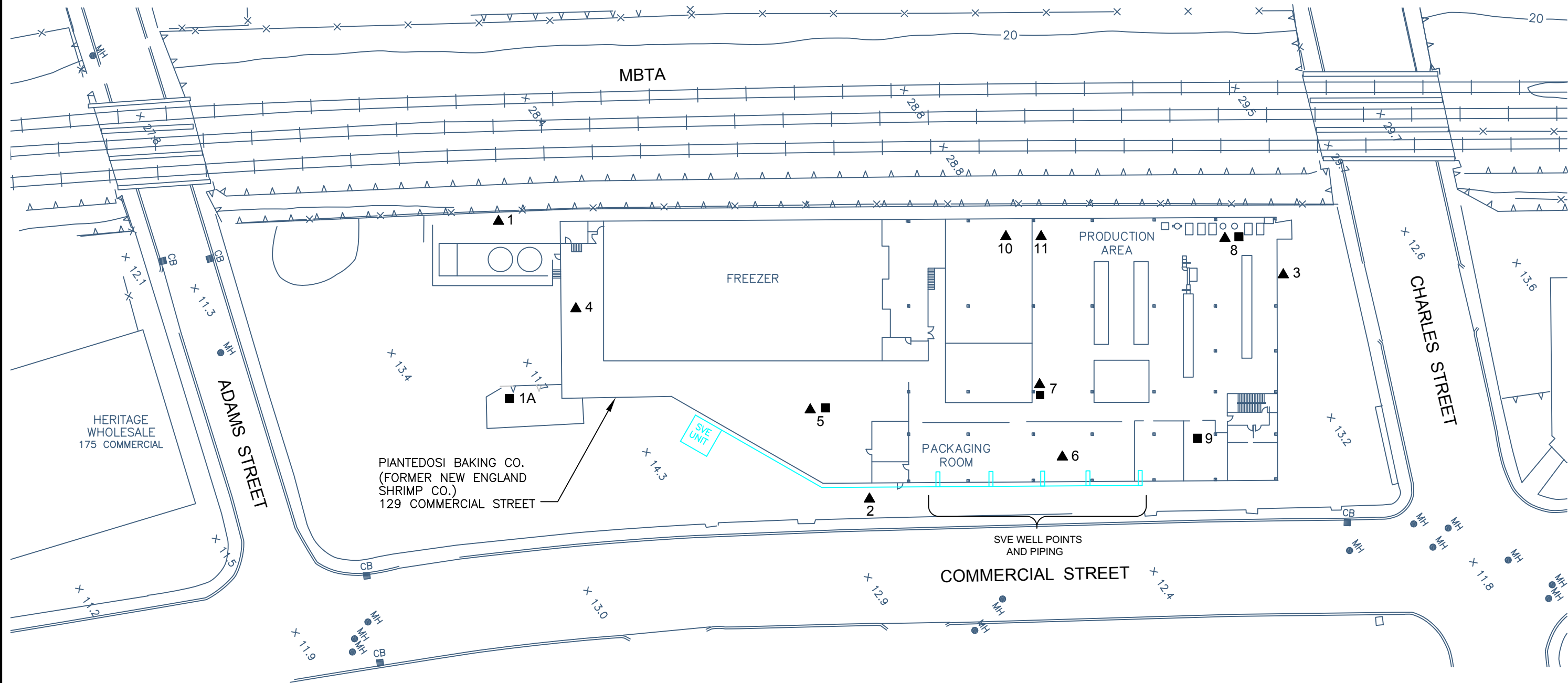
HALEY & ALDRICH, INC. NOTES:

1. BASE PLAN ADAPTED FROM "TOPOGRAPHIC WORKSHEET OF THE MANUFACTURED GAS PLANT, MALDEN, MA" FOR MASSACHUSETTS ELECTRIC COMPANY, WESTBOROUGH, MA, BY EASTERN TOPOGRAPHICS, WOLFEBORO, NH, SHEETS 1 AND 2, AT A SCALE OF 1 IN. EQUALS 40 FT., JUNE 1995, AND CITY OF MALDEN ASSESSOR'S PLAN SHEET NO. 53, BY FAY, SPOFFORD & THORNDIKE, INC., BOSTON, MA, AT A SCALE OF 1 IN. EQUALS 40 FT., UPDATED JUNE 1976 AND REVISED 30 JULY 1979.
2. LOCATION OF TEST BORINGS AND TEST PITS WERE DETERMINED BY HALEY & ALDRICH, INC.



Innovative Engineering Solutions, Inc.
25 SPRING STREET
WALPOLE, MASSACHUSETTS 02081
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TITLE				
RAM AREA				
SITE				
FORMER MALDEN MGP SITE				
CLIENT				
NATIONAL GRID				
DRAWN	CHECKED	FILENAME	DATE	FIGURE
DMR	ML	NG MALDEN RAM AREAS	3/28/08	2

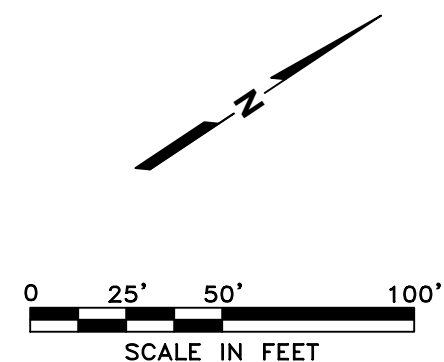


LEGEND

- 7 ▲ DESIGNATION AND APPROXIMATE LOCATION OF INDOOR AND OUTDOOR AIR SAMPLES OBTAINED BY ENVIRONMENTAL HEALTH & ENGINEERING, INC. AND HALEY & ALDRICH, INC. FROM NOVEMBER 1997 THROUGH FEBRUARY 2007
- 7 ■ DESIGNATION AND APPROXIMATE LOCATION OF INDOOR AIR SAMPLES OBTAINED BY OCCUHEALTH, INC., JUNE 1994
- DESIGNATION AND APPROXIMATE LOCATION OF "I" BEAM COLUMN LOCATION

NOTES

1. BASE PLAN ADAPTED FROM "TOPOGRAPHIC WORKSHEET OF THE MANUFACTURED GAS PLANT, MALDEN, MA" FOR MASSACHUSETTS ELECTRIC COMPANY, WESTBOROUGH, MA, BY EASTERN TOPOGRAPHICS, WOLFEBORO, NH, SHEETS 1 AND 2, AT A SCALE OF 1 IN. EQUALS 40 FT., JUNE 1995, AND CITY OF MALDEN ASSESSOR'S PLAN SHEET NO. 53, BY FAY, SPOFFORD & THORNDIKE, INC., BOSTON, MA AT A SCALE OF 1 IN. EQUALS 40 FT., UPDATED JUNE 1976 AND REVISED 30 JULY 1979.
2. INTERIOR FACILITY LAYOUT ADAPTED FROM UNDATED PLAN PROVIDED BY PIANTEDOSI BAKING COMPANY, FEBRUARY 1998.
3. APPROXIMATE LOCATIONS OF INDOOR AIR SAMPLING LOCATIONS WERE DETERMINED BY HALEY & ALDRICH, INC.



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TITLE

SITE PLAN

FORMER MALDEN MGP SITE

CLIENT

NATIONAL GRID

DRAWN
DMR

CHECKED
ML

FILENAME
NG MALDEN RAM AREAS

DATE
3/28/08

FIGURE
3

TABLES

Table 1
Sub-Slab Venting System Monitoring Data
129 Commercial Street
Malden, Massachusetts

Monitoring Date	Total VOC Concentrations			Outdoor Ambient Air Temp. (°F)	Outlet Vapor Temp. (°F)	Flow Velocity (cubic ft./min)		System Vacuum (in. water)			Vacuum at Extraction Points (in. water)				
	Influent (ppm)	Effluent - 1 (ppm)	Effluent - 2 (ppm)			Influent	Effluent	Blower	Knockout Drum	Discharge	EP-1	EP-2	EP-3	EP-4	EP-5
9-Oct-07	-	-	-	60	-	-	-	-	-	-			Restart system		
21-Oct-07	-	-	-	-	-	-	-	-	-	-			System off		
22-Oct-07	-	-	-	65	-	-	-	-	-	-			Restart system		
23-Oct-07	-	-	-	65	130	33	110	10	5	50	-	-	-	-	-
30-Oct-07	0.0	0.0	0.0	60	130	29	110	10	5	50	-	-	-	-	-
18-Nov-07	-	-	-	-	-	-	-	-	-	-			System off		
19-Nov-07	-	-	-	35	70	-	-	4	2	55			Restart system		
24-Nov-07	-	-	-	-	-	-	-	-	-	-			System off		
27-Nov-07	-	-	-	40	-	-	-	-	-	-			Restart system		
28-Nov-07	0.0	0.0	0.0	50	110	31	114	10	5	52	-	-	-	-	-
3-Dec-07											System operational, remove one GAC vessel				
17-Jan-08	0.0	-	0.0	34	84	65	157	10.5	2.8	40	1.7	2.1	0.0	0.0	2.5
18-Feb-08	0.0	-	0.0	64	90	60	140	9	2.7	41	2.1	2.3	0.0	0.0	2.4
28-Mar-08	0.0	-	0.0	37	96	59	145	8.2	1.6	47	0.0	1.5	0.0	0.0	1.6
10-Apr-08	0.0	0.0	0.0	65	88	113	98	8	4.1	18	1.9	1.6	1.6	0.4	1.6
10-May-08	0.0	0.0	0.0	60	80	97	95	9	5.8	17	1.6	1.8	2.0	0.1	1.5
10-Jun-08	0.0	0.0	0.0	95	104	89	93	8.7	5	16.3	1.8	1.8	1.6	0.3	1.8
16-Jun-08	(Reactivate System after power outage)														
7-Jul-08	0.0	0.0	0.0	88	100	89	88.5	8.7	5	16.2	1.5	1.5	1.5	0.1	1.4
12-Aug-08	0.0	0.0	0.0	85	94	94	91	9.6	5.8	16.2	1.8	1.9	1.4	0.3	1.3
8-Sep-08	0.0	0.0	0.0	80	100	90	86	10	6.5	15	1.2	1.8	1.2	1.2	1.6

Notes & Abbreviations:

IESI began operation of the SSVS system in December 2007

cubic ft./min = Cubic feet per Minute (actual in field measurement, not adjusted for temperature and pressure)

in. water = Inches of water pressure/vacuum

ppm = Parts per million as measured with a PID

ug/l = Micrograms per liter (roughly equal to 1 part per billion)

°F = Degrees Fahrenheit

- = Not Available/Not Measured

ND = Non Detect; method detection limit < 1ug/L



Table 2
Indoor Air Sample Results
129 Commercial Street
Malden, MA

Sample Results (Results listed in ug/m³)

Date	ANALYTE	Site 2		Site 4		Site 5		Site 6		Site 7		Site 7		Site 8		Site 10		Site 11		Sys-Inf	
		Result	DL	Result	DL	Result	DL	Result	DL	Result	DL	Duplicate		Result	DL	Result	DL	Result	DL	Result	DL
12-Feb-04	Benzene	20.8		ND	1.7	ND	1.7	ND	8.6	ND	12.8			ND	18.5	ND	20.1				
06-May-04	Benzene	ND	1.5	ND	1.9	1.7		ND	1.9	ND	1.8			ND	2.1	ND	1.9				
06-Aug-04	Benzene	ND	1.8	ND	3.5	ND	3.4	ND	33	ND	34			ND	3.5	ND	35				
26-Oct-04	Benzene	2.2		ND	1.7	ND	1.5	ND	1.8	1.7				ND	1.5			1.9			
13-Jan-05	Benzene	3.8		2.6		2.8		2.8		2.8				3.5				3.4			
27-Apr-05	Benzene	ND	1.5	ND	1.5	ND	2	ND	14	ND	13			ND	31			ND	42		
03-Aug-05	Benzene	ND	1.8	ND	1.4	ND	3.6	ND	10	ND	13							ND	11		
20-Oct-05	Benzene	ND	1.6	ND	1.5	ND	1.6	ND	5.4	ND	5.9			ND	5.9			ND	6		
19-Jan-06	Benzene	ND	1.6	ND	2	ND	1.4	ND	1.5	ND	2.5			ND	1.8			ND	1.7		
19-Apr-06	Benzene	ND	1.5	ND	1	ND	1.2	ND	24	ND	20			ND	1.7						
28-Feb-07	Benzene	2.7		1.9		2.6		ND	9.1	ND	28			ND	53			ND	53		
16-Apr-08	Benzene	1.4	0.87	1.4	0.61	1.1	0.82	ND	1.7	1.2	0.87	1.3	0.75	ND	15					2.4	0.96
12-Feb-04	Ethylbenzene	16.9		ND	1.6	ND	1.7	ND	8.7	ND	13			ND	18.7	ND	20				
06-May-04	Ethylbenzene	ND	1.5	ND	1.9	1.7		ND	1.9	2				ND	2.1	ND	1.9				
06-Aug-04	Ethylbenzene	ND	1.8	ND	3.5	ND	3.4	ND	33	ND	34			ND	3.5	ND	35				
26-Oct-04	Ethylbenzene	ND	1.4	ND	1.7	ND	1.5	ND	1.8	ND	1.6			ND	1.5			ND	1.6		
13-Jan-05	Ethylbenzene	2.8		2.7		3.5		1.5		2.3				2.4				2.6			
27-Apr-05	Ethylbenzene	ND	1.5	ND	1.5	ND	2	ND	14	ND	13			ND	31			ND	42		
03-Aug-05	Ethylbenzene	ND	1.8	1.7		ND	3.6	ND	10	ND	13							ND	11		
20-Oct-05	Ethylbenzene	ND	1.6	ND	1.5	ND	1.6	ND	5.4	ND	5.9			ND	5.9			ND	6		
19-Jan-06	Ethylbenzene	ND	1.6	ND	2	ND	1.4	ND	1.5	ND	2.5			ND	1.8			ND	1.7		
19-Apr-06	Ethylbenzene	ND	1.5	1.3		1.5		ND	24	ND	20			ND	1.7						
28-Feb-07	Ethylbenzene	ND	1.7	1.8		1.6		ND	9.1	ND	28			ND	53			ND	53		
16-Apr-08	Ethylbenzene	ND	0.87	0.82	0.61	ND	0.82	ND	1.7	1.1	0.87	1.2	0.75	ND	15					12	0.96
12-Feb-04	m-&p-xylenes	52.1		2		3		ND	8.7	ND	13			ND	18.7	ND	20				
06-May-04	m-&p-xylenes	2.9		3.5		4.2		4		7.6				5.4		6.4					
06-Aug-04	m-&p-xylenes	2.9		3.5		ND	3.4	ND	33	ND	34			ND	3.5	ND	35				
26-Oct-04	m-&p-xylenes	3.6		3.2		4.4		3.1		4				2.9				3.5			
13-Jan-05	m-&p-xylenes	8.2		8		11		3.6		6				6.4				6.9			
27-Apr-05	m-&p-xylenes	ND	1.5	1.7		ND	2	ND	14	ND	13			ND	31			ND	42		
03-Aug-05	m-&p-xylenes	2.8		5		5.8		ND	10	ND	13							ND	11		
20-Oct-05	m-&p-xylenes	1.6		1.8		1.9		ND	5.4	ND	5.9			ND	5.9			ND	6		
19-Jan-06	m-&p-xylenes	ND	1.6	2.6		2.2		2.8		3.4				2.1				2.7			
19-Apr-06	m-&p-xylenes	ND	3	3.8		4.1		ND	48	ND	41			ND	3.4						
28-Feb-07	m-&p-xylenes	3.5		6.7		4.6		ND	9.1	ND	28			ND	53			ND	53		
16-Apr-08	m-&p-xylenes	2.0	1.7	2.3	1.2	1.9	1.6	ND	3.3	2.2	1.7	2.4	1.5	ND	29					35	1.9

Table 2
Indoor Air Sample Results
129 Commercial Street
Malden, MA

Sample Results (Results listed in ug/m ³)																				
Date	ANALYTE	Site 2		Site 4		Site 5		Site 6		Site 7		Site 7	Site 8		Site 10		Site 11		Sys-Inf	
		Outside										Duplicate								
		Result	DL	Result	DL	Result	DL	Result	DL	Result	DL		Result	DL	Result	DL	Result	DL	Result	DL
12-Feb-04	Naphthalene	2		ND	1.7	ND	1.7	ND	8.9	ND	13.1		ND	18.3	ND	19.9				
06-May-04	Naphthalene	ND	1.5	ND	1.9	ND	1.6	ND	1.9	ND	1.8		ND	2.1	ND	1.9				
06-Aug-04	Naphthalene	ND	1.8	ND	3.5	ND	3.4	ND	33	ND	34		ND	3.5	ND	35				
26-Oct-04	Naphthalene	ND	1.4	ND	1.7	ND	1.5	ND	1.8	ND	1.6		ND	1.5			ND	1.6		
13-Jan-05	Naphthalene	ND	1.4	ND	1.3	ND	1.5	ND	1.2	ND	1.2		ND	1.4			ND	1.8		
27-Apr-05	Naphthalene	ND	1.5	ND	1.5	ND	2	ND	14	ND	13		ND	31			ND	42		
03-Aug-05	Naphthalene	ND	1.8	ND	1.4	ND	3.6	ND	10	ND	13						ND	11		
20-Oct-05	Naphthalene	ND	1.6	ND	1.5	ND	1.6	ND	5.4	ND	5.9		ND	5.9			ND	6		
19-Jan-06	Naphthalene	ND	1.6	ND	2	ND	1.4	ND	1.5	ND	2.5		ND	1.8			ND	1.7		
19-Apr-06	Naphthalene	ND	1.5	ND	1	ND	1.2	ND	24	ND	20		ND	1.7						
28-Feb-07	Naphthalene	ND	1.7	ND	1.4	ND	1.2	ND	9.1	ND	28		ND	53			ND	53		
16-Apr-08	Naphthalene	ND	0.87	ND	0.61	ND	0.82	ND	1.7	ND	0.87	ND	0.75	ND	15				1.4	0.96
12-Feb-04	o-xylenes	18.7		ND	1.6	ND	1.7	ND	8.7	ND	13		ND	18.7	ND	20				
06-May-04	o-xylenes	ND	1.5	ND	1.9	1.6		ND	1.9	3			2.2		2.6					
06-Aug-04	o-xylenes	ND	1.8	ND	3.5	ND	3.4	ND	33	ND	34		ND	3.5	ND	35				
26-Oct-04	o-xylenes	ND	1.4	ND	1.7	ND	1.5	ND	1.8	ND	1.6		ND	1.5			ND	1.6		
13-Jan-05	o-xylenes	2.8		2.2		2.6		1.3		1.7			2.1				2.1			
27-Apr-05	o-xylenes	ND	1.5	ND	1.5	ND	2	ND	14	ND	13		ND	31			ND	42		
03-Aug-05	o-xylenes	ND	1.8	ND	1.4	ND	3.6	ND	10	ND	13						ND	11		
20-Oct-05	o-xylenes	ND	1.6	ND	1.5	ND	1.6	ND	5.4	ND	5.9		ND	5.9			ND	6		
19-Jan-06	o-xylenes	ND	1.6	ND	2	ND	1.4	ND	1.5	ND	2.5		ND	1.8			ND	1.7		
19-Apr-06	o-xylenes	ND	1.5	ND	1	ND	1.2	ND	24	ND	20		ND	1.7						
28-Feb-07	o-xylenes	ND	1.7	1.5		1.5		ND	9.1	ND	28		ND	53			ND	53		
16-Apr-08	o-xylenes	ND	0.87	0.87	0.61	ND	0.82	ND	1.7	ND	0.87	0.98	0.75	ND	15				8.6	0.96
12-Feb-04	Styrene	2.1		ND	1.7	ND	1.7	ND	8.5	ND	12.8		ND	18.7	ND	20				
06-May-04	Styrene	ND	1.5	ND	1.9	ND	1.6	ND	1.9	ND	1.8		ND	2.1	2.8					
06-Aug-04	Styrene	ND	1.8	ND	3.5	ND	3.4	ND	33	ND	34		ND	3.5	ND	35				
26-Oct-04	Styrene	ND	1.4	ND	1.7	ND	1.5	ND	1.8	ND	1.6		ND	1.5			ND	1.6		
13-Jan-05	Styrene	ND	1.4	ND	1.3	ND	1.5	ND	1.2	ND	1.2		1.5				ND	1.8		
27-Apr-05	Styrene	ND	1.5	ND	1.5	ND	2	ND	14	ND	13		ND	31			ND	42		
03-Aug-05	Styrene	ND	1.8	ND	1.4	ND	3.6	ND	10	ND	13						ND	11		
20-Oct-05	Styrene	ND	1.6	ND	1.5	ND	1.6	ND	5.4	ND	5.9		ND	5.9			ND	6		
19-Jan-06	Styrene	ND	1.6	ND	2	ND	1.4	ND	1.5	ND	2.5		ND	1.8			ND	1.7		
19-Apr-06	Styrene	ND	1.5	ND	1	ND	1.2	ND	24	ND	20		ND	1.7						
28-Feb-07	Styrene	ND	1.7	ND	1.4	ND	1.2	ND	9.1	ND	28		ND	53			ND	53		
16-Apr-08	Styrene	ND	1.7	ND	1.2	ND	1.6	ND	3.3	ND	1.7	ND	1.5	ND	29				13	1.9

Table 2
Indoor Air Sample Results
129 Commercial Street
Malden, MA

Sample Results (Results listed in ug/m ³)																							
Date		ANALYTE		Site 2		Site 4		Site 5		Site 6		Site 7		Site 7		Site 8		Site 10		Site 11		Sys-Inf	
				Outside										Duplicate									
				Result	DL	Result	DL	Result	DL	Result	DL	Result	DL			Result	DL	Result	DL	Result	DL	Result	DL
12-Feb-04	Toluene	71.6		4.5		5.3		56.5		ND	12.8					ND	18.5	ND	20				
06-May-04	Toluene	85		33		72		18		13						8.7		11					
06-Aug-04	Toluene	5.1		9		7.5		ND	33	ND	34					3.6		ND	35				
26-Oct-04	Toluene	6.8		6.7		9		13		6.9						5.1				6.6			
13-Jan-05	Toluene	18		16		16		15		10						12				13			
27-Apr-05	Toluene	2.9		4.7		7.6		ND	14	ND	13					ND	31			ND	42		
03-Aug-05	Toluene	4.4		7.8		7.6		11		ND	13									ND	11		
20-Oct-05	Toluene	3.9		3.2		3.6		9		ND	5.9					ND	5.9			ND	6		
19-Jan-06	Toluene	2.4		6.4		4.2		13		5						3.7				4			
19-Apr-06	Toluene	3.8		5.2		4.2		ND	24	ND	20					2.5							
28-Feb-07	Toluene	5.4		4.2		5.7		ND	9.1	ND	28					ND	53			ND	53		
16-Apr-08	Toluene	4.8	0.87	5.8	0.61	4.3	0.82	5.6	1.7	4.3	0.87	14	0.75			ND	15					31	0.96
16-Apr-08	1,3-Butadiene	ND	0.87	ND	0.61	ND	0.82	ND	1.7	ND	0.87	ND	0.75			ND	15					ND	0.96
16-Apr-08	Methyl tert-Butyl Ether	ND	0.87	ND	0.61	ND	0.82	ND	1.7	ND	0.87	ND	0.75			ND	15					ND	0.96
16-Apr-08	2-Methylnaphthalene	ND	0.87	ND	0.61	ND	0.82	ND	1.7	ND	0.87	ND	0.75			ND	15					ND	0.96
16-Apr-08	C5 - C8 Aliphatic Hydrocarbons	ND	69	70	48	ND	66	ND	130	91	69	110	60	ND	1200							520	77
16-Apr-08	C9 - C12 Aliphatic Hydrocarbons	24	17	18	12	27	16	71	33	33	17	48	15	ND	290							140	19
16-Apr-08	C9 - C10 Aromatic Hydrocarbons	ND	17	ND	12	ND	16	ND	33	ND	17	ND	15	ND	290							34	19

NOTES AND ABBREVIATIONS:

All results n micrograms per cubic meter (ug/m³)

ND: compound not detected above detection limit noted

DL: Detection limit for analyte

Table 3
Summary of Indoor Air Data
and Inhalation Risk Estimates
129 Commercial Street
Malden, MA

Analytical Data (ug/m ³)													
	Benzene	Ethylbenzene	m-&p-xylenes	Naphthalene	o-xylenes	Styrene	Toluene	1,3-Butadiene	Methyl tert-Butyl Ether	2-Methyl-naphthalene	C5 - C8 Aliphatic Hydrocarbons	C9 - C12 Aliphatic Hydrocarbons	C9 - C10 Aromatic Hydrocarbons
[OHM] _{air} ¹	2.2	1.9	4.1	NA	1.9	2.2	10.8	NA	NA	NA	90.3	39.4	NA
Detects	15	16	40	0	14	2	48	0	0	0	3	5	0
Samples	70	70	70	70	70	70	70	6	6	6	6	6	6
Max	3.5	3.5	11.0	0.0	3.0	2.8	72.0	0.0	0.0	0.0	110.0	71.0	0.0
Min	1.1	0.8	11.0	0.0	0.9	1.5	2.5	0.0	0.0	0.0	70.0	18.0	0.0
Median	1.9	1.7	3.5	NA	1.9	2.2	7.2	NA	NA	NA	91.0	33.0	NA
DEP 90th UPV	11.0	7.4	28.0	2.7	28.0	1.4	54.0				330.0	220.0	44.0

Risk Calculation Equations and Standard Parameter Values

Cancer Risk from Inhalation
 $ELCR_{air} = LADE_{(1-31)} \cdot URF$ where: $LADE = \frac{[OHM]_{air} \cdot EF \cdot ED \cdot EP_{(1-31)}}{AP_{(lifetime)}}$

Noncancer Risk from Inhalation
 $HQ_{air} = \frac{ADE \cdot C}{RIC}$ where: $ADE = \frac{[OHM]_{air} \cdot EF \cdot ED \cdot EP_{(1-31)}}{AP_{(noncancer)}}$

	Benzene	Ethylbenzene	Xylenes	Naphthalene	Xylenes	Styrene	Toluene	1,3-Butadiene	Methyl tert butyl ether	Methylnaphthalene, 2-	Aliphatics C5 to C8	Aliphatics C9 to C12	Aromatics C9 to C10
URF (ug/m3)-1	7.80E-06					5.7E-07		NA					
RIC mg/m3	3.00E-02	1.00E+00	1.0E-01	3.00E-03	1.0E-01	1.0E+00	5.0E+00	NA	3.0E+00	5.00E-02	2.0E-01	2.0E-01	5.0E-02

Parameter	Value	Units
ELCR - Excess Lifetime Cancer Risk	--	dimensionless
URF - Unit Risk Factor	--	(ug/m ³) ⁻¹
LADE - Lifetime Average Daily Exposure	--	ug/m ³
HQ - Hazard Quotient	--	dimensionless
RIC - Reference Concentration	--	mg/m ³
ADE - Average Daily Exposure	--	ug/m ³
EPC - Exposure Point Concentration	--	ug/L

Parameter	Value	Units
EF - Exposure Frequency	See Below	event/day
ED - Exposure Duration	See Below	day/event
EP ₍₁₋₈₎ - Exposure Period for age group 1-8	7	years
EP ₍₁₋₃₁₎ - Exposure Period for age group 1-31	30	years
AP _(noncancer) - Averaging Period for noncancer	7	years
AP _(lifetime) - Averaging Period for lifetime	70	years
C = Conversion Factor (mg to ug)	0.001	mg/ug

Residential Exposure Scenario

EF - Exposure Frequency		1.00	event/day	ED - Exposure Duration		1.00	day/event							Total	Limits
ELCR	7.29E-06				5.25E-07									8.E-06	1.E-05
	93%				7%										
HI	7.27E-02	1.86E-03	4.07E-02	NA	1.88E-02	2.15E-03	2.16E-03	NA	NA	NA	4.52E-01	1.97E-01	NA	8.E-01	1.E+00
	9%	0%	5%	NA	2%	0%	0%	NA	NA	NA	57%	25%	NA		

Commercial Exposure Scenario

EF - Exposure Frequency		0.33	event/day	ED - Exposure Duration		0.71	day/event							Total	Limits
ELCR	1.71E-06				1.23E-07									2.E-06	1.E-05
	93%				7%										
HI	1.70E-02	4.35E-04	9.52E-03	NA	4.39E-03	5.04E-04	5.06E-04	NA	NA	NA	1.06E-01	4.62E-02	NA	2.E-01	1.E+00
	9%	0%	5%	NA	2%	0%	0%	NA	NA	NA	57%	25%	NA		

Notes

¹
ug/m3 Average of detected concentrations only (detection limits not included) from February 2004 through April 2008. Does not include outdoor (site 2) or "sys-inf" samples.

Risk calculation equations and standard parameter values from DEP "Short Forms for Human Health Risk Assessment under the MCP" Updated February 2007
For Commercial Exposure EF changed to 8 hours per 24 hours (0.33) to represent work shift and ED changed to 5 days per 7 day week (0.71) to represent work week
DEP 90th UPV = Data from Draft DEP Policy Entitled "Typical Indoor Air Concentrations - Technical Update Policy #08-XXX"

APPENDIX A

COPY OF RELEASE ABATEMENT MEASURE (RAM) TRANSMITTAL FORM (BWSC-106) AND REMEDIAL MONITORING REPORT

APPENDIX B

LABORATORY DATA REPORT - AIR SAMPLES

LABORATORY REPORT

May 6, 2008

Michael Lotti
Innovative Engineering Solutions, Incorporated
25 Spring Street
Walpole, MA 02081

RE: 129 Commercial

Dear Michael:

Enclosed are the results of the samples submitted to our laboratory on April 18, 2008. For your reference, these analyses have been assigned our service request number P0801103.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 19 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

Columbia Analytical Services, Inc.



Kate Aguilera
Project Manager

Client: Innovative Engineering Solutions, Incorporated
Project: 129 Commercial

CAS Project No: P0801103

CASE NARRATIVE

The samples were received intact under chain of custody on April 18, 2008 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Air-Phase Petroleum Hydrocarbons (APH) Analysis

The samples were also analyzed for selected and total aliphatic and aromatic gasoline range hydrocarbons by gas chromatography/mass spectrometry according to the Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Public Comment Draft 1.0, Massachusetts Department of Environmental Protection, February, 2000.

Styrene Analysis

The samples were also analyzed for styrene in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator.

The reporting limit is elevated for sample Site-8. The chromatogram indicated the presence of non-target background components. The sample was diluted in order to prevent damage to the instrument and the results are flagged accordingly.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

Client: Innovative Engineering Solutions, Incorporated
Project: 129 Commercial

Folder: P0801103

Detailed Sample Information

<u>CAS Sample ID</u>	<u>Client Sample ID</u>	<u>Container Type</u>	<u>Pi1</u> (Hg)	<u>Pi1</u> (psig)	<u>Pi2</u> (Hg)	<u>Pi2</u> (psig)	<u>Cont ID</u>	<u>Order #</u>	<u>FC ID</u>	<u>Order #</u>
P0801103-001.01	Site-5	6.0 L-Summa Canister Ambient	-7.4	-3.6	3.5		AC01202	8288	FC00327	8288
P0801103-002.01	Site-4	6.0 L-Summa Canister Ambient		0.3	3.5		AC01245	8288	FC00241	8288
P0801103-003.01	Site-6	6.0 L-Summa Canister Ambient	-7.5	-3.7	3.5		AC01336	8288	FC00310	8288
P0801103-004.01	Site-2	6.0 L-Summa Canister Ambient	-8.6	-4.2	3.5		AC01043	8288	FC00293	8288
P0801103-005.01	Site-7	6.0 L-Summa Canister Ambient	-8.5	-4.2	3.5		AC01193	8288	FC00352	8288
P0801103-006.01	Site-77	6.0 L-Summa Canister Ambient	-5.2	-2.6	3.5		AC00988	8288	FC00613	8288
P0801103-007.01	Site-8	6.0 L-Summa Canister Ambient	-8.8	-4.3	3.5		AC00656	8288	FC00578	8288
P0801103-008.01	Sys-Inf	6.0 L-Summa Canister Ambient	-10.6	-5.2	3.5		AC00818	8288	FC00535	8288

Miscellaneous Items - received

AVG000469
 AVG000528
 AVG000115
 AVG000686
 AVG000484
 AVG000525
 AVG000582
 AVG000463

**2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270**

Page 1 of 1

[illegible]

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Innovative Engineering Solutions, Incorporated

Work order: P0801103

Project: 129 Commercial

Sample(s) received on: 4/18/2008

Date opened: 4/18/2008

by: MZAMORA

Note: This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		<u>Yes</u>	<u>No</u>	<u>N/A</u>
1	Were sample containers properly marked with client sample ID?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Container(s) supplied by CAS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Did sample containers arrive in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Were chain-of-custody papers used and filled out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Did sample container labels and/or tags agree with custody papers?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Was sample volume received adequate for analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Are samples within specified holding times?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Was proper temperature (thermal preservation) of cooler at receipt adhered to?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Cooler Temperature _____ °C Blank Temperature _____ °C			
9	Was a trip blank received?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were custody seals on outside of cooler/Box?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Location of seal(s)? _____ Sealing Lid?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Were signature and date included?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Were seals intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Were custody seals on outside of sample container?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Location of seal(s)? _____ Sealing Lid?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Were signature and date included?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Were seals intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11	Do containers have appropriate preservation , according to method/SOP or Client specified information?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Is there a client indication that the submitted samples are pH preserved?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Were VOA vials checked for presence/absence of air bubbles?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12	Tubes: Are the tubes capped and intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Do they contain moisture?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13	Badges: Are the badges properly capped and intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Are dual bed badges separated and individually capped and intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0801103-001.01	6.0 L Ambient Can					
P0801103-002.01	6.0 L Ambient Can					
P0801103-003.01	6.0 L Ambient Can					
P0801103-004.01	6.0 L Ambient Can					
P0801103-005.01	6.0 L Ambient Can					
P0801103-006.01	6.0 L Ambient Can					
P0801103-007.01	6.0 L Ambient Can					

Explain any discrepancies: (include lab sample ID numbers): _____

*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);

Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12)

P0801103_Innovative Engineering Solutions, Incorporated_129 Commercial - Page 1 of 2

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

4/18/2008 2:02 PM

Sample Acceptance Check Form

Client: Innovative Engineering Solutions, Incorporated

Work order: P0801103

Project: 129 Commercial

Sample(s) received on: 4/18/2008

Date opened: 4/18/2008

by: MZAMORA

[illegible]

Explain any discrepancies: (include lab sample ID numbers):

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

Page 1 of 1

Client: Innovative Engineering Solutions, Incorporated

Client Project ID: 129 Commercial

CAS Project ID: P0801103

Styrene

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Rusty Bravo

Sampling Media: 6.0 L Summa Canister(s)

Test Notes:

Date(s) Collected: 4/16/08

Date Received: 4/18/08

Date Analyzed: 4/21 - 4/22/08

Client Sample ID	CAS Sample ID	Injection Volume Liter(s)	Canister Dilution Factor	Result $\mu\text{g}/\text{m}^3$	MRL $\mu\text{g}/\text{m}^3$	Result ppbV	MRL ppbV	Data Qualifier
Site-5	P0801103-001	1.00	1.64	ND	1.6	ND	0.39	
Site-4	P0801103-002	1.00	1.21	ND	1.2	ND	0.28	
Site-6	P0801103-003	0.50	1.65	ND	3.3	ND	0.78	
Site-2	P0801103-004	1.00	1.73	ND	1.7	ND	0.41	
Site-7	P0801103-005	1.00	1.73	ND	1.7	ND	0.41	
Site-77	P0801103-006	1.00	1.50	ND	1.5	ND	0.35	
Site-8	P0801103-007	0.060	1.75	ND	29	ND	6.9	
Sys-Inf	P0801103-008	1.00	1.92	13	1.9	3.0	0.45	
Method Blank	P080421-MB	1.00	1.00	ND	1.0	ND	0.23	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

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Client: Innovative Engineering Solutions, Incorporated
Client Sample ID: Site-5
Client Project ID: 129 Commercial

CAS Project ID: P0801103
CAS Sample ID: P0801103-001

Test Code: Massachusetts APH Public Comment Draft 1.0
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Rusty Bravo
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: AC01202

Date Collected: 4/16/08
Date Received: 4/18/08
Date Analyzed: 4/21/08
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -3.6 Final Pressure (psig): 3.5

Canister Dilution Factor: 1.64

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
	Unadjusted C ₅ - C ₈ Aliphatics ¹	69	66	NA	NA	+
	Unadjusted C ₉ - C ₁₂ Aliphatics ¹	31	16	NA	NA	+
106-99-0	1,3-Butadiene*	ND	0.82	ND	0.38	
1634-04-4	Methyl tert-Butyl Ether	ND	0.82	ND	0.23	
71-43-2	Benzene	1.1	0.82	0.36	0.26	
108-88-3	Toluene	4.3	0.82	1.1	0.21	
100-41-4	Ethylbenzene	ND	0.82	ND	0.20	
179601-23-1	m,p-Xylenes	1.9	1.6	0.43	0.38	
95-47-6	o-Xylene	ND	0.82	ND	0.20	
91-20-3	Naphthalene	ND	0.82	ND	0.16	
91-57-6	2-Methylnaphthalene	ND	0.82	ND	0.14	
	C ₅ - C ₈ Aliphatic Hydrocarbons ^{1,2}	ND	66	NA	NA	
	C ₉ - C ₁₂ Aliphatic Hydrocarbons ^{1,3}	27	16	NA	NA	+
	C ₉ - C ₁₀ Aromatic Hydrocarbons	ND	16	NA	NA	

¹Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

²C₅-C₈ Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

³C₉-C₁₂ Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C₉-C₁₀ Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

* = Due to matrix interference, 1,3-Butadiene results determined by EPA Method TO-15 quantitation method.

+ = Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas.

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Client: Innovative Engineering Solutions, Incorporated
Client Sample ID: Site-4
Client Project ID: 129 Commercial

CAS Project ID: P0801103
CAS Sample ID: P0801103-002

Test Code: Massachusetts APH Public Comment Draft 1.0
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Rusty Bravo
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: AC01245

Date Collected: 4/16/08
Date Received: 4/18/08
Date Analyzed: 4/21/08
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): 0.3 Final Pressure (psig): 3.5

Canister Dilution Factor: 1.21

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
	Unadjusted C ₅ - C ₈ Aliphatics ¹	82	48	NA	NA	+
	Unadjusted C ₉ - C ₁₂ Aliphatics ¹	28	12	NA	NA	+
106-99-0	1,3-Butadiene*	ND	0.61	ND	0.28	
1634-04-4	Methyl tert-Butyl Ether	ND	0.61	ND	0.17	
71-43-2	Benzene	1.4	0.61	0.43	0.19	
108-88-3	Toluene	5.8	0.61	1.5	0.16	
100-41-4	Ethylbenzene	0.82	0.61	0.19	0.15	
179601-23-1	m,p-Xylenes	2.3	1.2	0.53	0.28	
95-47-6	o-Xylene	0.87	0.61	0.20	0.15	
91-20-3	Naphthalene	ND	0.61	ND	0.11	
91-57-6	2-Methylnaphthalene	ND	0.61	ND	0.10	
	C ₅ - C ₈ Aliphatic Hydrocarbons ^{1,2}	70	48	NA	NA	+
	C ₉ - C ₁₂ Aliphatic Hydrocarbons ^{1,3}	18	12	NA	NA	+
	C ₉ - C ₁₀ Aromatic Hydrocarbons	ND	12	NA	NA	

¹Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

²C₅-C₈ Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

³C₉-C₁₂ Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C₉-C₁₀ Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

* = Due to matrix interference, 1,3-Butadiene results determined by EPA Method TO-15 quantitation method.

+ = Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas.

Verified By: CA Date: 5/5/08

COLUMBIA ANALYTICAL SERVICES, INC.

RESULTS OF ANALYSIS

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Client: Innovative Engineering Solutions, Incorporated

Client Sample ID: Site-6

Client Project ID: 129 Commercial

CAS Project ID: P0801103

CAS Sample ID: P0801103-003

Test Code: Massachusetts APH Public Comment Draft 1.0

Date Collected: 4/16/08

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Date Received: 4/18/08

Analyst: Rusty Bravo

Date Analyzed: 4/21/08

Sampling Media: 6.0 L Summa Canister

Volume(s) Analyzed: 0.50 Liter(s)

Test Notes:

Container ID: AC01336

Initial Pressure (psig): -3.7 Final Pressure (psig): 3.5

Canister Dilution Factor: 1.65

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
	Unadjusted C ₅ - C ₈ Aliphatics ¹	140	130	NA	NA	+
	Unadjusted C ₉ - C ₁₂ Aliphatics ¹	79	33	NA	NA	+
106-99-0	1,3-Butadiene*	ND	1.7	ND	0.76	
1634-04-4	Methyl tert-Butyl Ether	ND	1.7	ND	0.46	
71-43-2	Benzene	ND	1.7	ND	0.53	
108-88-3	Toluene	5.6	1.7	1.5	0.43	
100-41-4	Ethylbenzene	ND	1.7	ND	0.40	
179601-23-1	m,p-Xylenes	ND	3.3	ND	0.76	
95-47-6	o-Xylene	ND	1.7	ND	0.40	
91-20-3	Naphthalene	ND	1.7	ND	0.31	
91-57-6	2-Methylnaphthalene	ND	1.7	ND	0.28	
	C ₅ - C ₈ Aliphatic Hydrocarbons ^{1,2}	ND	130	NA	NA	
	C ₉ - C ₁₂ Aliphatic Hydrocarbons ^{1,3}	71	33	NA	NA	+
	C ₉ - C ₁₀ Aromatic Hydrocarbons	ND	33	NA	NA	

¹Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.²C₅-C₈ Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.³C₉-C₁₂ Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C₉-C₁₀ Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

* = Due to matrix interference, 1,3-Butadiene results determined by EPA Method TO-15 quantitation method.

+ = Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas.

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Client: Innovative Engineering Solutions, Incorporated
Client Sample ID: Site-2
Client Project ID: 129 Commercial

CAS Project ID: P0801103
CAS Sample ID: P0801103-004

Test Code: Massachusetts APH Public Comment Draft 1.0
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Rusty Bravo
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: AC01043

Date Collected: 4/16/08
Date Received: 4/18/08
Date Analyzed: 4/21/08
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.2 **Final Pressure (psig):** 3.5

Canister Dilution Factor: 1.73

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
	Unadjusted C ₅ - C ₈ Aliphatics ¹	ND	69	NA	NA	
	Unadjusted C ₉ - C ₁₂ Aliphatics ¹	29	17	NA	NA	+
106-99-0	1,3-Butadiene*	ND	0.87	ND	0.40	
1634-04-4	Methyl tert-Butyl Ether	ND	0.87	ND	0.24	
71-43-2	Benzene	1.4	0.87	0.44	0.28	
108-88-3	Toluene	4.8	0.87	1.3	0.22	
100-41-4	Ethylbenzene	ND	0.87	ND	0.21	
179601-23-1	m,p-Xylenes	2.0	1.7	0.47	0.40	
95-47-6	o-Xylene	ND	0.87	ND	0.21	
91-20-3	Naphthalene	ND	0.87	ND	0.16	
91-57-6	2-Methylnaphthalene	ND	0.87	ND	0.15	
	C ₅ - C ₈ Aliphatic Hydrocarbons ^{1,2}	ND	69	NA	NA	
	C ₉ - C ₁₂ Aliphatic Hydrocarbons ^{1,3}	24	17	NA	NA	+
	C ₉ - C ₁₀ Aromatic Hydrocarbons	ND	17	NA	NA	

¹Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

²C₅-C₈ Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

³C₉-C₁₂ Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C₉-C₁₀ Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

* = Due to matrix interference, 1,3-Butadiene results determined by EPA Method TO-15 quantitation method.

+ = Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas.

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COLUMBIA ANALYTICAL SERVICES, INC.

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Client: Innovative Engineering Solutions, Incorporated

Client Sample ID: Site-7

Client Project ID: 129 Commercial

CAS Project ID: P0801103

CAS Sample ID: P0801103-005

Test Code: Massachusetts APH Public Comment Draft 1.0

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Rusty Bravo

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: AC01193

Date Collected: 4/16/08

Date Received: 4/18/08

Date Analyzed: 4/21/08

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -4.2 Final Pressure (psig): 3.5

Canister Dilution Factor: 1.73

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
	Unadjusted C ₅ - C ₈ Aliphatics ¹	100	69	NA	NA	+
	Unadjusted C ₉ - C ₁₂ Aliphatics ¹	38	17	NA	NA	+
106-99-0	1,3-Butadiene*	ND	0.87	ND	0.40	
1634-04-4	Methyl tert-Butyl Ether	ND	0.87	ND	0.24	
71-43-2	Benzene	1.2	0.87	0.36	0.28	
108-88-3	Toluene	4.3	0.87	1.1	0.22	
100-41-4	Ethylbenzene	1.1	0.87	0.26	0.21	
179601-23-1	m,p-Xylenes	2.2	1.7	0.50	0.40	
95-47-6	o-Xylene	ND	0.87	ND	0.21	
91-20-3	Naphthalene	ND	0.87	ND	0.16	
91-57-6	2-Methylnaphthalene	ND	0.87	ND	0.15	
	C ₅ - C ₈ Aliphatic Hydrocarbons ^{1,2}	91	69	NA	NA	+
	C ₉ - C ₁₂ Aliphatic Hydrocarbons ^{1,3}	33	17	NA	NA	+
	C ₉ - C ₁₀ Aromatic Hydrocarbons	ND	17	NA	NA	

¹Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.²C₅-C₈ Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.³C₉-C₁₂ Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C₉-C₁₀ Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

* = Due to matrix interference, 1,3-Butadiene results determined by EPA Method TO-15 quantitation method.

+ = Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas.

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COLUMBIA ANALYTICAL SERVICES, INC.

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Client: Innovative Engineering Solutions, Incorporated

Client Sample ID: Site-77

Client Project ID: 129 Commercial

CAS Project ID: P0801103

CAS Sample ID: P0801103-006

Test Code: Massachusetts APH Public Comment Draft 1.0

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Rusty Bravo

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: AC00988

Date Collected: 4/16/08

Date Received: 4/18/08

Date Analyzed: 4/21/08

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.6 **Final Pressure (psig):** 3.5

Canister Dilution Factor: 1.50

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
	Unadjusted C ₅ - C ₈ Aliphatics ¹	130	60	NA	NA	+
	Unadjusted C ₉ - C ₁₂ Aliphatics ¹	54	15	NA	NA	+
106-99-0	1,3-Butadiene*	ND	0.75	ND	0.35	
1634-04-4	Methyl tert-Butyl Ether	ND	0.75	ND	0.21	
71-43-2	Benzene	1.3	0.75	0.40	0.24	
108-88-3	Toluene	14	0.75	3.7	0.20	
100-41-4	Ethylbenzene	1.2	0.75	0.28	0.18	
179601-23-1	m,p-Xylenes	2.4	1.5	0.55	0.35	
95-47-6	o-Xylene	0.98	0.75	0.22	0.18	
91-20-3	Naphthalene	ND	0.75	ND	0.14	
91-57-6	2-Methylnaphthalene	ND	0.75	ND	0.13	
	C ₅ - C ₈ Aliphatic Hydrocarbons ^{1,2}	110	60	NA	NA	+
	C ₉ - C ₁₂ Aliphatic Hydrocarbons ^{1,3}	48	15	NA	NA	+
	C ₉ - C ₁₀ Aromatic Hydrocarbons	ND	15	NA	NA	

¹Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

²C₅-C₈ Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

³C₉-C₁₂ Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C₉-C₁₀ Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

* = Due to matrix interference, 1,3-Butadiene results determined by EPA Method TO-15 quantitation method.

+ = Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas.

Verified By: CM Date: 5/5/08

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Client: Innovative Engineering Solutions, Incorporated
Client Sample ID: Site-8
Client Project ID: 129 Commercial

CAS Project ID: P0801103
 CAS Sample ID: P0801103-007

Test Code: Massachusetts APH Public Comment Draft 1.0
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Rusty Bravo
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: AC00656

Date Collected: 4/16/08
Date Received: 4/18/08
Date Analyzed: 4/22/08
Volume(s) Analyzed: 0.060 Liter(s)

Initial Pressure (psig): -4.3 **Final Pressure (psig):** 3.5

Canister Dilution Factor: 1.75

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
	Unadjusted C ₅ - C ₈ Aliphatics ¹	ND	1,200	NA	NA	
	Unadjusted C ₉ - C ₁₂ Aliphatics ¹	ND	290	NA	NA	
106-99-0	1,3-Butadiene*	ND	15	ND	6.7	
1634-04-4	Methyl tert-Butyl Ether	ND	15	ND	4.1	
71-43-2	Benzene	ND	15	ND	4.7	
108-88-3	Toluene	ND	15	ND	3.8	
100-41-4	Ethylbenzene	ND	15	ND	3.5	
179601-23-1	m,p-Xylenes	ND	29	ND	6.7	
95-47-6	o-Xylene	ND	15	ND	3.5	
91-20-3	Naphthalene	ND	15	ND	2.8	
91-57-6	2-Methylnaphthalene	ND	15	ND	2.5	
	C ₅ - C ₈ Aliphatic Hydrocarbons ^{1,2}	ND	1,200	NA	NA	
	C ₉ - C ₁₂ Aliphatic Hydrocarbons ^{1,3}	ND	290	NA	NA	
	C ₉ - C ₁₀ Aromatic Hydrocarbons	ND	290	NA	NA	

¹Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

²C₅-C₈ Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

³C₉-C₁₂ Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C₉-C₁₀ Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

* = Due to matrix interference, 1,3-Butadiene results determined by EPA Method TO-15 quantitation method.

Verified By: Car Date: 5/5/08

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Client: Innovative Engineering Solutions, Incorporated
Client Sample ID: Sys-Inf
Client Project ID: 129 Commercial

CAS Project ID: P0801103
CAS Sample ID: P0801103-008

Test Code: Massachusetts APH Public Comment Draft 1.0
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Rusty Bravo
Sampling Media: 6.0 L Summa Canister
Test Notes:
Container ID: AC00818

Date Collected: 4/16/08
Date Received: 4/18/08
Date Analyzed: 4/21/08
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -5.2 **Final Pressure (psig):** 3.5

Canister Dilution Factor: 1.92

CAS #	Compound	Result µg/m ³	MRL µg/m ³	Result ppbV	MRL ppbV	Data Qualifier
	Unadjusted C ₅ - C ₈ Aliphatics ¹	610	77	NA	NA	+
	Unadjusted C ₉ - C ₁₂ Aliphatics ¹	180	19	NA	NA	+
106-99-0	1,3-Butadiene*	ND	0.96	ND	0.44	
1634-04-4	Methyl tert-Butyl Ether	ND	0.96	ND	0.27	
71-43-2	Benzene	2.4	0.96	0.75	0.31	
108-88-3	Toluene	31	0.96	8.1	0.25	
100-41-4	Ethylbenzene	12	0.96	2.8	0.23	
179601-23-1	m,p-Xylenes	35	1.9	8.0	0.44	
95-47-6	o-Xylene	8.6	0.96	2.0	0.23	
91-20-3	Naphthalene	1.4	0.96	0.27	0.18	
91-57-6	2-Methylnaphthalene	ND	0.96	ND	0.17	
	C ₅ - C ₈ Aliphatic Hydrocarbons ^{1,2}	520	77	NA	NA	+
	C ₉ - C ₁₂ Aliphatic Hydrocarbons ^{1,3}	140	19	NA	NA	+
	C ₉ - C ₁₀ Aromatic Hydrocarbons	34	19	NA	NA	+

¹Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

²C₅-C₈ Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

³C₉-C₁₂ Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C₉-C₁₀ Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

* = Due to matrix interference, 1,3-Butadiene results determined by EPA Method TO-15 quantitation method.

+ = Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas.

Verified By: LA Date: 5/5/08

COLUMBIA ANALYTICAL SERVICES, INC.

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Client: Innovative Engineering Solutions, Incorporated
Client Sample ID: Method Blank
Client Project ID: 129 Commercial

CAS Project ID: P0801103
CAS Sample ID: P080421-MB

Test Code: Massachusetts APH Public Comment Draft 1.0
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Rusty Bravo
Sampling Media: 6.0 L Summa Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 4/21/08
Volume(s) Analyzed: 1.00 Liter(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
	Unadjusted C ₅ - C ₈ Aliphatics ¹	ND	40	NA	NA	
	Unadjusted C ₉ - C ₁₂ Aliphatics ¹	ND	10	NA	NA	
106-99-0	1,3-Butadiene*	ND	0.50	ND	0.23	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
71-43-2	Benzene	ND	0.50	ND	0.16	
108-88-3	Toluene	ND	0.50	ND	0.13	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
91-20-3	Naphthalene	ND	0.50	ND	0.095	
91-57-6	2-Methylnaphthalene	ND	0.50	ND	0.086	
	C ₅ - C ₈ Aliphatic Hydrocarbons ^{1,2}	ND	40	NA	NA	
	C ₉ - C ₁₂ Aliphatic Hydrocarbons ^{1,3}	ND	10	NA	NA	
	C ₉ - C ₁₀ Aromatic Hydrocarbons	ND	10	NA	NA	

¹Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

²C₅-C₈ Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

³C₉-C₁₂ Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C₉-C₁₀ Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

* = Due to matrix interference, 1,3-Butadiene results determined by EPA Method TO-15 quantitation method.

COLUMBIA ANALYTICAL SERVICES, INC.

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

Client: Innovative Engineering Solutions, Incorporated
Client Project ID: 129 Commercial

CAS Project ID: P0801103

Test Code: EPA Massachusetts APH Public Comment Draft 1.0
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Rusty Bravo
Sampling Media: Summa Canister(s)
Test Notes:

Date(s) Collected: 4/16/08
Date(s) Received: 4/18/08
Date(s) Analyzed: 4/21 - 4/22/08

Client Sample ID	CAS Sample ID	1,2-Dichloroethane-d4		Toluene-d8		Bromofluorobenzene		Data Qualifier
		% Recovered	Acceptance Limits	% Recovered	Acceptance Limits	% Recovered	Acceptance Limits	
Method Blank	P080421-MB	112	70-130	111	70-130	98	70-130	
Lab Control Sample	P080421-LCS	114	70-130	111	70-130	100	70-130	
Site-5	P0801103-001	112	70-130	112	70-130	98	70-130	
Site-4	P0801103-002	112	70-130	112	70-130	97	70-130	
Site-6	P0801103-003	112	70-130	114	70-130	98	70-130	
Site-2	P0801103-004	114	70-130	113	70-130	99	70-130	
Site-7	P0801103-005	114	70-150	112	70-150	97	70-150	
Site-77	P0801103-006	113	70-130	114	70-130	97	70-130	
Site-8	P0801103-007	116	70-130	113	70-130	96	70-130	
Sys-Inf	P0801103-008	110	70-130	114	70-130	101	70-130	
Sys-Inf	P0801103-008DUP	111	70-130	114	70-130	99	70-130	

COLUMBIA ANALYTICAL SERVICES, INC.

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: Innovative Engineering Solutions, Incorporated
Client Sample ID: Lab Control Sample
Client Project ID: 129 Commercial

CAS Project ID: P0801103
CAS Sample ID: P080421-LCS

Test Code: Massachusetts APH Public Comment Draft 1.0
Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13
Analyst: Rusty Bravo
Sampling Media: 6.0 L Summa Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 4/21/08
Volume(s) Analyzed: NA Liter(s)

CAS #	Compound	Spike Amount ng	Result ng	% Recovery	CAS Acceptance Limits	Data Qualifier
106-99-0	1,3-Butadiene*	30.0	28.1	94	67-127	
1634-04-4	Methyl tert-Butyl Ether	25.0	24.7	99	70-130	
71-43-2	Benzene	25.0	23.7	95	70-130	
108-88-3	Toluene	25.0	25.2	101	70-130	
100-41-4	Ethylbenzene	25.0	26.9	108	70-130	
179601-23-1	m,p-Xylenes	50.0	56.5	113	70-130	
95-47-6	o-Xylene	25.0	27.6	110	70-130	
91-20-3	Naphthalene	25.0	26.9	108	70-130	
91-57-6	2-Methylnaphthalene	25.0	27.5	110	50-150	

* = Due to matrix interference, 1,3-Butadiene results determined by EPA Method TO-15 quantitation method.

COLUMBIA ANALYTICAL SERVICES, INC.

LABORATORY DUPLICATE SUMMARY RESULTS

Page 1 of 1

Client: Innovative Engineering Solutions, Incorporated

Client Sample ID: Sys-Inf

Client Project ID: 129 Commercial

CAS Project ID: P0801103

CAS Sample ID: P0801103-008DUP

Test Code: Massachusetts APH Public Comment Draft 1.0

Instrument ID: Tekmar AUTOCAN/Agilent 5975Binert/6890N/MS13

Analyst: Rusty Bravo

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: AC00818

Date Collected: 4/16/08

Date Received: 4/18/08

Date Analyzed: 4/21/08

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -5.2 **Final Pressure (psig):** 3.5

Canister Dilution Factor: 1.92

CAS #	Compound	Sample Result		Duplicate Sample Result		Average µg/m ³	% RPD	RPD Limit	Data Qualifier
		µg/m ³	ppbV	µg/m ³	ppbV				
	Unadjusted C5 - C8 Aliphatics ¹	607	NA	610	NA	608.5	0.5	25	+
	Unadjusted C9 - C12 Aliphatics ¹	177	NA	165	NA	171	7	25	+
106-99-0	1,3-Butadiene*	ND	ND	ND	ND	-	-	25	
1634-04-4	Methyl tert-Butyl Ether	ND	ND	ND	ND	-	-	25	
71-43-2	Benzene	2.40	0.752	2.48	0.776	2.44	3	25	
108-88-3	Toluene	30.6	8.13	30.5	8.09	30.55	0.3	25	
100-41-4	Ethylbenzene	12.4	2.85	12.5	2.88	12.45	0.8	25	
179601-23-1	m,p-Xylenes	34.5	7.95	34.5	7.94	34.5	0	25	
95-47-6	o-Xylene	8.56	1.97	8.52	1.96	8.54	0.5	25	
91-20-3	Naphthalene	1.40	0.267	1.42	0.271	1.41	1	25	
91-57-6	2-Methylnaphthalene	ND	ND	ND	ND	-	-	25	
	C5 - C8 Aliphatic Hydrocarbons ^{1,2}	519	NA	521	NA	520	0.4	25	+
	C9 - C12 Aliphatic Hydrocarbons ^{1,3}	141	NA	129	NA	135	9	25	+
	C9 - C10 Aromatic Hydrocarbons	34.5	NA	34.0	NA	34.25	1	25	+

¹Hydrocarbon Range data from total ion chromatogram excluding any internal/tuning standards eluting in that range.

²C₅-C₈ Aliphatic Hydrocarbons exclude the concentration of Target APH analytes eluting in that range.

³C₉-C₁₂ Aliphatic Hydrocarbons exclude concentration of Target APH Analytes eluting in that range and concentration of C₉-C₁₀ Aromatic Hydrocarbons.

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

* = Due to matrix interference, 1,3-Butadiene results determined by EPA Method TO-15 quantitation method.

+ = Significant non-petroleum related peaks (i.e. halogenated, oxygenated, terpenes, etc.) are subtracted from the hydrocarbon range areas.