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# CITY OF SOMERVILLE

Office of Strategic Planning & Community Development

**TO:** Planning Board  
**FROM:** Planning & Zoning Division  
**DATE:** June 4, 2020  
**RE:** DRA2020-0052, 345 Medford St

This memo summarizes the development review application submitted for 345 Medford Street, identifies any additional discretionary or administrative development review that is required by the Somerville Zoning Ordinance, and provides related analysis or feedback as necessary. The application was deemed complete on May 4, 2020 and is scheduled for a public hearing before the Zoning Board of Appeals on June 10, 2020.

## SUMMARY OF PROPOSAL

345 Medford Street, LLC is proposing to demolish all existing structures on the site and construct a new 6-story general building. The proposed development will produce 5,175 square feet of commercial space, 53 dwelling units, 6 commercial/accessory motor vehicle parking spaces, 60 long-term bicycle parking spaces, 10 short-term bicycle parking spaces, and the proposed landscape will earn a Green Score of 0.28.

## ADDITIONAL REVIEW NECESSARY

345 Medford Street is located in the Mid-Rise 4 (MR4) zoning district in the Gilman Square neighborhood represented by Ward 4 Councilor Jesse Clingan. The building is proposed to have a nonconforming additional two (2) stories, a nonconforming total building height, and a nonconforming rear setback, which requires three (3) variances. A general building is permitted in the MR4 district by site plan approval, which is the required administrative review and approval type for development that conforms with the provisions of the Somerville Zoning Ordinance. Site plan approval allows for potential development impacts to be addressed by the Planning Board, which is the decision-making authority for all site plan approvals in the MR4 zoning district. For the 345 Medford Street development review application to be deemed conforming with the Somerville Zoning Ordinance, the

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required variances listed above must be approved by the Zoning Board of Appeals prior to any other Site Plan Approval required by the zoning district.

## REQUIRED FINDINGS

In accordance with the Somerville Zoning Ordinance, the Zoning Board of Appeals may grant a hardship variance only upon finding all of the following for **each** requested variance:

1. Special circumstances exist relating to the soil conditions, shape, or topography of a parcel of land or the unusual character of an existing structure but not affecting generally the MR4 district where the land is located;
2. Literal enforcement of the provisions of the MR4 district would involve substantial hardship, financial or otherwise, to the petitioner, 345 Medford Street, LLC, due to said circumstances; and
3. Desirable relief could be granted without causing substantial detriment to the public good and without nullifying or substantially derogating from the intent and purpose of the MR4 district or the Somerville Zoning Ordinance in general.

The Applicant is required to provide an argument addressing the review criteria for each of the necessary hardship variances, and the narrative provided by the Applicant in the application is attached to this memo as an **Appendix**. In terms of staff input for the relief requested by the Applicant, Planning & Zoning Division staff typically only provides feedback concerning the intent and purpose of the zoning district where the property is located and the zoning ordinance in general.

Upon analysis of the material submitted by the Applicant, the Planning & Zoning Staff does not believe that the granting of the requested hardship variances would cause a substantial detriment to the public good or nullify or substantially derogate from the intent and purpose of the MR4 district, which is provided below:

### 4.2.2. Intent

- a. To implement the objectives of the comprehensive plan of the City of Somerville.
- b. To create, maintain, and enhance areas appropriate for smaller scale, multi-use and mixed-use buildings and neighborhood serving uses.

### 4.2.3. Purpose

- a. To permit the development of multi-unit and mixed-use buildings that do not exceed four (4) stories in height.
- b. To provide quality commercial spaces and permit small scale, neighborhood-serving commercial uses.
- c. To create dwelling unit types, sizes, and bedroom counts ideal for larger households in apartment buildings.
- d. To create dwelling unit types, sizes, and bedroom counts ideal for smaller households in general buildings.
- e. To permit increased residential density for buildings that are sustainable or that provide 100% affordable housing.

f. To permit increased residential density for buildings that meet the definition of a Net Zero Ready Building or 100% affordable housing.

Additionally, the Planning & Zoning Staff believes that granting the requested hardship variances would support the broader intent of the Somerville Zoning Ordinance, including, but not limited to, the following:

#### 1.1.4. Intent

1. To equitably balance the regulation of real property with the interests of the community as a whole.
2. To provide a range of housing types, unit sizes, and price points to accommodate the diverse household sizes and life stages of Somerville residents at all income levels.
3. To provide and protect housing that is affordable to households with low and moderate incomes.
4. To capture a fiscal return on investments made in transportation infrastructure by locating higher intensity development, employment opportunities, and a broad mix of uses along major corridors and within walking distance of transit stops.

Massachusetts courts have stated that variances will naturally deviate from the intent and purpose of a zoning ordinance to some degree and that the discretionary approval of a variance is defensible if the deviation is not substantial or significant in comparison to the intent and purpose for the district in appraising the effect of the proposal on the entire neighborhood, including future impacts and other development approved or denied in the general vicinity of the development site.



Prepared For:

Mr. Elan Sassoon  
109 Prospect Street, LLC  
295 Upland Avenue  
Newton, MA 02461

December 2, 2019

## **Phase II Subsurface Investigation Program**

345 Medford Street  
Somerville, MA 02145  
IES Project No. 2018-08-0527

Prepared By:  
IES, Inc.  
50 Salem Street, Building A - Suite 108  
Lynnfield, MA 01940  
1-617-623-8880



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December 2, 2019

Mr. Elan Sassoon  
109 Prospect Street, LLC  
295 Upland Avenue  
Newton, MA 02461

Re: Phase II Subsurface Investigation  
345 Medford Street  
Somerville, MA 02145  
IES Project No. 2018-08-0527

Dear Mr. Sassoon,

As requested, and in accordance with the Terms of our Contract, IES, Inc. performed a subsurface soil/groundwater sampling and analysis program at the site on October 22, 2019. This testing program was performed at your request, in order to address the potential on-site and off-site threats of contamination identified in a “Phase I Environmental Site Assessment” report dated August 31, 2018 by IES (Project No. 2018-08-0527).

This program consisted of the advancement of six (6) test borings (B-1 through B-6) and the installation of three monitoring wells in borings B-1 (IES-1), B-2 (IES-2), and B-6 (IES-6). Existing monitoring wells (OW-2, MW-6, MW-3, MW-4, and MW-5A) were also identified at the site and sampled as part of this investigation. The program also included soil sample screening, and laboratory analysis of soil and groundwater samples.

#### **A. Introduction**

The subject site consists of one, nearly rectangular-shaped parcel of land located at 345 Medford Street, in the City of Somerville, MA. The subject site is occupied by a one-story, concrete-block structure, which contains no basement. The site building is currently utilized as a gasoline filling station and automotive repair facility (Good Gas). The site building utilizes waste oil heat, stored aboveground, and is connected to the municipal water and sewer systems. According to historical records, the site building appears to have been constructed in approximately 1937.

The site is listed as the location of a UST-related release (RTN 3-3191), a RCRA Generator (MAD040180119), and a UST Facility (ID# 10910). Past Potential On-Site Environmental Concerns (PECs) identified during the Phase I investigation included the former presence of three, 3,000-gallon gasoline USTs removed in 1975; the former presence of three, 2,000, 4,000, and 8,000-gallon gasoline USTs, and two waste oil and fuel oil USTs, all removed in 1997; and the former presence of two floor drains and an oil-water separator, decommissioned at an unknown time. Existing on-site potential environmental Concerns (PECs) included at the time of the Phase I investigation included the current presence of one, 10,000-gallon and two, 5,000-gallon gasoline USTs; three, 275-gallon waste oil and motor oil ASTs; approximately twenty-five, 55-gallon drums containing waste oil, motor oil, anti-freeze, waste anti-freeze, and windshield washer fluid; and dozens of small containers ( $\leq 1$  gallon in size) of automotive repair fluids.

*IES, Inc. Project # 2018-08-0527  
December 2, 2019*



Recognized Environmental Conditions (RECs) identified during the Phase I investigation include the use of the subject site as various gasoline filling stations and automotive repair facilities dating back to approximately 1937. Recognized Environmental Conditions are defined as “the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property”. Historical Recognized Environmental Conditions (HRECs) identified during the Phase I investigation included the listing of the site as a UST-related release (RTN 3-3191), for which a Class A-2 RAO was submitted to the DEP in 1998. Also, there were no Controlled Recognized Environmental Conditions (CRECs) identified at the subject site during the Phase I investigation.

Nearby off-site Potential Environmental Concerns (PECs) identified during the Phase I investigation included the southeasterly adjoining “DPS” State Disposal Site located at 343 Medford Street (RTN 3-10851), with the DPS Submittal attributing the contamination to the subject site; the “Unclassified” State Disposal Site (RTN 3-34587), RCRA Generator (MAC300100955), and Federal Brownfield Site (ID# 227962) located at 91 Marshall Street, which is situated approximately 50 feet to the east of the site; and the nearby gasoline filling station (Mobil), RCRA Generator (MV6176255555), and UST Facility (ID# 10925) located at 360 Medford Street, situated approximately 100 feet to the west of the site.

## **B. Subsurface Investigation**

In order to address the aforementioned potential on-site and off-site PECs and RECs, and to determine the current condition of soil and groundwater at the site, a subsurface soil/groundwater sampling and analysis program was performed at the site on October 22, 2019. This testing program was performed at your request in order to address the REC and potential on-site and off-site threats of contamination identified in a “Phase I Environmental Site Assessment” report, dated August 31, 2018 by IES (Project No. 2018-08-0527). This program consisted of the advancement of six (6) test borings (B-1 through B-6) and the installation of three monitoring wells in borings B-1 (IES-1), B-2 (IES-2), and B-6 (IES-6). Existing monitoring wells (OW-2, MW-6, MW-3, MW-4, and MW-5A) were also identified at the site and sampled as part of this investigation. The program also included soil sample screening, and laboratory analysis of soil and groundwater samples.

Borings/monitoring wells B-1/IES-1 and B-2/IES-2, were advanced within the automotive repair garage; borings B-4 and B-5 were advanced in the westerly and northerly corners of the property, respectively; boring B-5 was advanced in the southwest portion of the site along Medford Street; and boring/monitoring well B-6/IES-6 was advanced to the southeast of the building, in the vicinity of a former fuel oil UST. Furthermore, existing monitoring wells OW-2 and MW-5A are present in the south-southeast portion of the site, in the vicinity of the UST pad; existing monitoring well MW-6 is present in the easterly corner of the site; and existing monitoring wells MW-4 and MW-3 are present in the westerly portion of the site. Groundwater was encountered at between 7.78 and 8.43 feet below ground surface (bgs). The locations of the test borings/monitoring wells at the site are shown in Figure 3 in **Attachment “A”**.

The test borings were advanced by TDS of Sterling, MA utilizing a track-mounted, percussion hammer driving system (Geoprobe 6610 DT). A split spoon sampler was utilized to collect samples at five foot depths, and all sampling equipment was then decontaminated with clean water and detergent prior to the collection of the next sample. Each sample removed from the split-spoon sampler was placed into pre-cleaned 8 oz. jars for headspace screening. Test boring logs are included in **Attachment “B”** of this

report.

The soil samples obtained from the site were screened with a MiniRae Lite Organic Vapor Meter (OVM) to detect the presence of Volatile Organic Compounds (VOC's) in the soil headspace. The results of the soil sample screening revealed non-detect to low levels of VOCs (0.0-0.5 ppm) in all soil samples. The VOC headspace readings from borings B-1 through B-8 are summarized in the following Table 1:

**Table 1**  
**Soil Sample Screening Results**

<b>Boring No.</b>	<b>Sample No.</b>	<b>Depth (feet)</b>	<b>VOC's (ppm)</b>
B-1/IES-1	S-1	0-5	0.2
	<b>S-2</b>	<b>5-7.5</b>	<b>6.8</b>
	<b>S-3</b>	<b>7.5-10</b>	<b>265</b>
	S-4	10-13	4.2
	S-5	13-15	0.1
B-2/IES-2	S-1	0-2.5	0.2
	<b>S-2</b>	<b>2.5-5</b>	<b>0.0</b>
	S-3	5-8	0.0
	S-4	8-10	0.0
	S-5	10-14	0.2
B-3	S-1	0-5	0.0
	S-2	5-7.5	0.0
	S-3	7.5-10	0.0
B-4	<b>S-1</b>	<b>0-4</b>	<b>0.0</b>
	S-2	4-5	0.0
	S-3	5-6	0.1
	S-4	6-7.5	0.1
	S-5	7.5-10	0.0
B-5	S-1	0-5	0.0
	S-2	5-7.5	0.0
	<b>S-3A</b>	<b>7.5-8.5</b>	<b>1.2</b>
	S-3B	8.5-10	0.0
B-6	S-1	0-5	0.0
	S-2	5-7.5	9.0
	<b>S-3</b>	<b>7.5-10</b>	<b>136</b>
	S-4	10-11	63
	S-5	11-13	6.5

**Note:** **Bold** = Submitted for Laboratory Analysis.

Soil samples B-1/S-2, B-1/S-3, B-2/S-2, B-4/S-1, B-5/S-3A, and B-6/S-3 were submitted to Phoenix Laboratories of Manchester, CT for laboratory analysis for Extractable Petroleum Hydrocarbons (EPH) with Polycyclic Aromatic Hydrocarbons (PAHs) and Volatile Petroleum Hydrocarbons (VPH) with target analytes due the current/former underground storage of fuel oil and gasoline and use of the site as a gasoline filling station; and/or RCRA 8 Metals due to the presence of fill material at the site. The soil laboratory analytical results are summarized in the following Table 2:

**Table 2**  
**Summary of Soil Testing Results**

Sample ID	B-1/ S-2	B-1/ S-3	B-2/ S-2	B-4/ S-1	B-5/ S-3A	B-6/ S-3	RCS-1 Standards (mg/kg)
<b>Depth (feet):</b>	5-7.5	7.5-10	2.5-5	0-4	7.5-8.5	7.5-10	
<b>VOC's (ppmv)</b>	6.8	265	0.0	0.0	1.2	136	
<b>EPH w/PAHs (mg/kg)</b>							
C <sub>9</sub> -C <sub>18</sub> Aliphatics	NT	<80	NT	NT	<77	<b>1,200</b>	1,000
C <sub>19</sub> -C <sub>36</sub> Aliphatics		<80			<77	320	3,000
C <sub>11</sub> -C <sub>22</sub> Aromatics		<80			<77	890	1,000
2-Methylnaphthalene	0.44	NT	0.42	0.33	NT	NT	0.7
Acenaphthene	< 0.25		1.3	0.87			4
Acenaphthylene	0.54		0.64	0.82			1
Anthracene	0.28		5	2.3			1,000
Benz(a)anthracene	1		6.4	5.9			7
Benzo(a)pyrene	1.2		<b>5.5</b>	<b>5.7</b>			2
Benzo(b)fluoranthene	0.98		5.2	5.1			7
Benzo(ghi)perylene	0.92		3.3	4.1			1,000
Benzo(k)fluoranthene	1		3.7	4.2			70
Chrysene	1.1		5.7	5.8			70
Dibenz(a,h)anthracene	< 0.25		<b>1</b>	0.34			0.7
Fluoranthene	1.7		13	12			1,000
Fluorene	< 0.25		2.2	1			1,000
Indeno(1,2,3-cd)pyrene	1.1		4	4.7			7
Naphthalene	0.53		0.43	0.48			4
Phenanthrene	0.65		<b>15</b>	10			10
Pyrene	1.8		11	9.8			1,000
<b>VPH w/Target VOCs (mg/kg)</b>							
C <sub>5</sub> -C <sub>8</sub> Aliphatics	NT	<6.1	NT	NT	<8.1	<7.5	100
C <sub>9</sub> -C <sub>12</sub> Aliphatics		14			<8.1	61	1,000
C <sub>9</sub> -C <sub>10</sub> Aromatics		11			<8.1	40	100
Naphthalene		<0.031			<0.40	0.42	4
Xylenes		<0.061			<.081	0.011	100
<b>RCRA 8 Metals (mg/kg)</b>							
Arsenic	6.34	NT	9.85	10.2	NT	NT	20
Barium	81.3		102	156			1,000
Cadmium	0.77		0.79	3.68			70
Chromium	18.2		16.2	17.8			100
Lead	106		<b>863</b>	<b>697</b>			200
Mercury	0.1		0.18	0.26			20
Selenium	< 1.5		< 1.4	< 1.5			400
Silver	< 0.38		< 0.35	< 0.38			100
<b>Notes:</b> NT = Not Tested. RCS-1 = Reportable Concentration, Soil Category RCS-1. <b>Bold</b> = At or above applicable RCS-1 standard.							

As shown in Table 2, no concentrations of any VPH or target VOCs, were identified in soil samples submitted for laboratory analysis above applicable RCS-1 standards. However, the concentrations of the PAH Benzo(a)pyrene in soil samples B-2/S-2 (5.5 mg/kg) and B-4/S-1 (5.7 mg/kg); the PAH Dibenz(a,h)anthracene in soil sample B-2/S-2 (1 mg/kg); and the PAH Phenanthrene in soil sample B-2/S-2 (15 mg/kg), are all above the applicable RCS-1 standards of 2 mg/kg, 0.7 mg/kg, and 10 mg/kg, respectively. Lead was identified in soil sample B-2/S-2 (863 mg/kg) and B-4/S-1 (697 mg/kg) above the applicable RCS-1 standard of 200 mg/kg. Further, the concentration of the EPH fraction in soil sample

B-6/S-3 (1,200 mg/kg) is above the applicable RCS-1 standard of 1,000 mg/kg. Therefore, a reportable release to the soil was identified during this investigation.

However, pursuant to 310 CMR 40.0317(9), “releases of oil and/or hazardous material related to coal, coal ash, or wood ash, excluding wood ash resulting from the combustion of lumber or wood products that have been treated with chemical preservatives” do not require notification. Due to the identification of fill materials containing coal or asphalt at the site, IES’ Inc. recommended submitting samples B-2/S-2 and B-4/S-1 for Coal Ash Analysis to confirm the presence of coal/coal ash in these fill materials. Should coal ash be confirmed to be present, the levels of Lead and PAHs may be considered “anthropogenic background” and thus exempt from reporting, as they are consistent with soil associated with fill material, as summarized in the DEP’s May 2002 “technical update – Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil”.

For notification purposes, the soil samples obtained from the site are classified as RCS-1 since they satisfy one or more of the following criteria: the samples were collected from within 500 feet of **1. a residential dwelling, residentially zoned property, school**, playground, recreational area, or park; or 2. within the geographic boundaries of a groundwater resource area categorized as RCGW-1 [310 CMR 40.0362(1)(a)]. Laboratory reports are included in **Attachment “C”** of this submittal.

Due to visual evidence of fill materials including cobbles, porcelain, concrete, coal, and/or coal ash in the soil samples to a depth of up to 5-7.5 feet bgs, and an identification of elevated levels of the PAH Benzo(a)pyrene in soil samples B-2/S-2 (5.5 mg/kg) and B-4/S-1 (5.7 mg/kg); the PAH Dibenz(a,h)anthracene in soil sample B-2/S-2 (1 mg/kg); and the PAH Phenanthrene in soil sample B-2/S-2 (15 mg/kg); and Lead in soil samples B-2/S-2 (863 mg/kg) and B-4/S-1 (697 mg/kg), soil samples B-2/S-2 and B-4/S-1 were submitted to Microvision Laboratories of Chelmsford, MA for Coal Ash Analysis. The analysis detects and documents the presence of any coal, coal ash, asphalt, or wood ash that may be present in soil samples utilizing a combination of microscopy techniques including Polarized Light Microscopy (PLM) and Scanning Electron Microscopy with Energy Dispersive X-Ray Spectroscopy (SEM/EDS).

According to the Microvision report, two (2) suspect particles were identified in sample B-2/S-2. Microvision stated that the first “particle type consisted of over fifty (50+) shiny, black grains approximately 1-9mm in diameter” and “the PLM examination indicated this particle type to be consistent with coal.” The second “particle type consisted of twenty-four (24) dark, porous grains approximately 1-10mm in diameter”; and “the PLM examination indicated this particle type to be consistent with coal ash.”

According to the Microvision report, three (3) suspect particles were identified in sample B-4/S-1. Microvision stated that the first “particle type consisted of thirty-two to thirty-five (32-35) shiny, black grains approximately 1-13mm in diameter”; and “the PLM examination indicated this particle type to be consistent with coal”. The second “particle type consisted of four (4) dark, porous grains approximately 1-6mm in diameter”; and “the PLM examination indicated this particle type to be consistent with coal ash.” The third “particle type consisted of over fifty (50+) ductile, black grains approximately 1-12mm in diameter”; and “during the PLM examination, these particles slowly dissolved in the mounting oil which is a typical characteristic of asphalt.”

It should be noted that according to the DEP's May 2002 "technical update – Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil", the MADEP Identified Background levels of the PAHs Benzo(a)pyrene, Dibenz(a,h)anthracene, and Phenanthrene and the metal Lead consistent with soil associated with fill material as 7, 1, 20, and 600 mg/kg, respectively. The levels detected at the site above RCS-1 standards are within or approaching these concentrations in the Technical Update document. Therefore, it is the opinion of IES, pursuant to 310 CMR 40.0006 the elevated levels of these contaminants identified in the Urban Fill at the site are considered anthropogenic background. Pursuant to 310 CMR 40.0006, Anthropogenic Background is defined as "levels of oil and hazardous material that would exist in the absence of the disposal site of concern" and which are:

- (a) attributable to atmospheric deposition of industrial process or engine emissions and are ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern;
- (b) attributable to Historic Fill;
- (c) associated with sources specifically exempt from the definitions of disposal site or release as those terms are defined in MGL c. 21E and 310 CMR 40.0006;
- (d) releases to groundwater from a public water supply system; or
- (e) petroleum residues that are incidental to the normal operation of motor vehicles.

Historic Fill is defined as "Material that based on the weight of evidence and consistent with the Conceptual Site Model":

- (a) was emplaced before January 1, 1983;
- (b) may contain, but is not primarily composed of, construction and demolition debris, reworked soils, dredge spoils, coal ash, wood ash or other solid waste material;
- (c) was contaminated with metals, hydrocarbons, and/or polycyclic aromatic hydrocarbons prior to emplacement, at concentrations consistent with the pervasive use and release of such materials prior to 1983;
- (d) does not contain oil or hazardous materials originating from operations or activities at the location of emplacement;
- (e) is not and does not contain a generated hazardous waste, other than Oil or Waste Oil;
- (f) does not contain chemical production waste, manufacturing waste, or waste from processing of metal or mineral ores, residues, slag or tailings; and
- (g) does not contain waste material disposed in a municipal solid waste dump, burning dump, landfill, waste lagoon or other waste disposal location.

Therefore, pursuant to 310 CMR 40.0317(9), the presence of Benzo(a)pyrene, Dibenz(a,h)anthracene, Phenanthrene, and Lead in soil are considered "Releases and Threats of Releases Which Do Not Require Notification", since it has been determined to be "releases of oil and/or hazardous material related to coal, coal ash, or wood ash, excluding wood ash resulting from the combustion of lumber or wood products that have been treated with chemical preservatives" do not require notification.

Furthermore, as previously discussed, the concentration of the EPH fraction in soil sample B-6/S-3 (1,200 mg/kg) is above the applicable RCS-1 standard of 1,000 mg/kg. A review of a "Response Action Outcome (RAO) Statement" report dated August 31, 1998, prepared by IES relative to the on-site State Disposal Site (RTN 3-3191), indicated that the general vicinity of B-6 was previously explored by IES in 1997 during removal of a former 500 gallon fuel oil UST. Confirmatory soil sampling from the excavation revealed TPH concentrations up to 2,100 mg/kg. While EPH and VPH testing was not performed in 1997, the current 2019 testing from B-6/S-3 revealed a TPH concentration of approximately 2,500 mg/kg. This

is considered to be generally consistent with the previous concentrations identified in the 1998 RAO report from the subject site. Furthermore, it should be noted that no RCGW-2 exceedances of any Contaminants of Concern were identified in monitoring well IES-6 during the current subsurface investigation, as further discussed in this report. Pursuant to 310 CMR 40.0317: Releases and Threats of Release Which Do Not Require Notification; (17) “releases indicated by the presence of oil and/or hazardous material at disposal sites for which a determination or statement as specified in 310 CMR 40.0317(17)(a) through (f) has been provided, in concentrations that would otherwise meet one or more of the sets of criteria set forth in 310 CMR 40.0313 or 40.0315, unless the presence of such oil and/or hazardous material would negate or change such determinations or statements were that presence taken into account in the preparation thereof, or changes in activities, uses, and/or exposures at the disposal site require notification to the Department pursuant to the provisions of 310 CMR 40.0020. In this context, determinations or statements include:” (b) “a disposal site where a Class A or Class B Response Action Outcome Statement has been submitted to the Department in compliance with the provisions of 310 CMR 40.1000.” Therefore, pursuant to 310 CMR 40.0317(17)(b), the concentration of the EPH fraction in soil sample B-6/S-3 (1,200 mg/kg), above the applicable RCS-1 standard of 1,000 mg/kg, is considered to be exempt from reporting.

### **C. Groundwater Sampling and Analysis**

On October 30, 2019, groundwater sampling was performed on the newly installed monitoring wells (IES-1, IES-2, and IES-6) and the existing monitoring wells identified at the site (OW-2, MW-3, MW-4, MW-5A, and MW-6). The location of these monitoring wells is shown in Figure 3 **Attachment “A”** of this report. In addition, a MassGIS Priority Resources Map is included as Figure 4 in **Attachment “A”**.

Groundwater samples were obtained from the newly installed monitoring wells (IES-1, IES-2, and IES-6) and the existing wells (OW-2, MW-3, MW-4, MW-5A, and MW-6) utilizing a low-flow, low-stress methodology via a peristaltic pump and were preserved according to EPA guidelines published in 40 CMR 136, and forwarded to Phoenix Laboratories of Manchester, CT for the laboratory analysis of EPH with PAHs, VPH with Target Analytes, and/or dissolved MCP-14 Metals to address the former underground storage at the site and use of the site as a gasoline filling station, and/or the presence of fill materials at the site. The groundwater laboratory results are summarized in the following Table 3:

**Table 3**  
**Summary of Groundwater Testing Results**

Sample ID:	IES-1	IES-2	IES-6	OW-2	MW-3	MW-4	MW-5A	MW-6	RCGW-2 Standards (mg/L)
<b>GW Depth (Feet)</b>	8.43	7.78	8.10	8.24	7.78	8.07	9.01	7.89	
<b>Total Well Depth (Feet)</b>	14.88	14.91	14.92	13.50	13.9	15.24	15.02	14.22	
<b>EPH w/PAHs (mg/l)</b>									
C <sub>9</sub> -C <sub>18</sub> Aliphatics	<0.19	<0.19	<0.19	<0.19	<0.2	<0.19	<0.19	<0.2	5
C <sub>19</sub> -C <sub>36</sub> Aliphatics	<0.19	<0.19	<0.19	<0.19	<0.2	<0.19	<0.19	<0.2	50
C <sub>11</sub> -C <sub>22</sub> Aromatics	<0.19	<0.19	<0.19	<0.19	<0.2	<0.19	<0.19	<0.2	5
2-Methylnaphthalene	0.00061	<0.00047	0.0039	<0.00047	<0.00048	<0.00047	<0.00047	<0.00047	2
Acenaphthene	0.0013	<0.00047	0.00048	<0.00047	<0.00048	<0.00047	<0.00047	<0.00047	6
Acenaphthylene	0.00012	<0.00009	0.0001	<0.00009	<0.00001	<0.00009	<0.00009	<0.00009	0.04
Anthracene	0.00049	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	<0.00009	0.03
Benzo(g,h,i)perylene	<0.00002	0.00002	<0.00002	<0.00002	<0.00002	0.00007	<0.00002	<0.00002	0.02
Chrysene	0.00006	<0.00005	<0.00005	<0.00005	<0.00001	0.00006	<0.00005	<0.00005	0.07
Dibenz(a,h)anthracene	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00003	<0.00002	<0.00002	0.04
Fluoranthene	0.00079	<0.00047	<0.00047	<0.00047	<0.00048	<0.00047	<0.00047	<0.00047	0.2
Fluorene	0.0017	<0.00009	0.0012	<0.00009	<0.0001	<0.00009	<0.00009	<0.00009	0.04
Naphthalene	0.00076	<0.00047	<0.00009	<0.00047	<0.00048	<0.00047	<0.00047	<0.00047	0.7
Phenanthrene	0.0032	<0.00047	0.00092	<0.00047	<0.00048	<0.00047	<0.00047	<0.00047	10
Pyrene	0.00058	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	<0.00007	0.02
<b>VPH with Target VOCs (mg/L)</b>									
C <sub>5</sub> -C <sub>8</sub> Aliphatics	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	3
C <sub>9</sub> -C <sub>12</sub> Aliphatics	<0.1	<0.1	0.14	<0.1	<0.1	<0.1	<0.1	<0.1	5
C <sub>9</sub> -C <sub>10</sub> Aromatics	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	4
MTBE	<0.001	0.079	0.0034	0.019	0.12	0.21	0.0058	0.0097	
<b>RCRA 8 Metals (mg/l)</b>									
Barium							0.047		50
Nickel	NT	NT	NT	NT	NT	NT	0.002	NT	0.02
Vanadium							0.003		4
Zinc							0.005		0.9
<b>Notes:</b> NT = Not Tested. RCGW-2 = Reportable Concentration, Groundwater Category RCGW-2.									

As shown in Table 3, there were no levels of any EPH, PAH, VPH, VOC compounds, or Metals identified in wells IES-1, IES-2, IES-6, OW-2, MW-3, MW-4, MW-5A, or MW-6, above applicable RCGW-2 standards. Therefore, a reportable release to the groundwater was **not** identified during this investigation.

For the October 2019 laboratory reports, chains-of-custody, and laboratory certifications, please see **Attachment "C"** this report.

The groundwater at the site is classified as RCGW-2, as described in the MCP [310 CMR 40.0362(1)(b)], since the site **is not** located within a Current or Potential Drinking Water Source Area. A Current Drinking Water Source Area as defined by the MCP includes the following: a.) the Zone II for a public water supply; b.) the Interim Wellhead Protection Area (IWPA) for a public water supply; c.) the Zone A of Class A surface water body used as a public water supply; and d.) an area within 500 feet of a private water supply well.

According to 310 CMR 40.0006, a Current Drinking Water Source Area is defined as groundwater located: (a) within the Zone II for a public water supply; (b) within the Interim Wellhead Protection Area for a public water supply; (c) within the Zone A of a Class A surface water body used as a public water supply; or (d) within 500 feet of a private water supply well. A Potential Drinking Water Source Areas

is defined as groundwater located: (a) 500 feet or more from a public water supply distribution pipeline; (b) within an area designated by a municipality specifically for the protection of groundwater quality to ensure its availability for use as a source of potable water supply; or (c) within a Potentially Productive Aquifer that has not been excluded as a Non-Potential Drinking Water Source Area, as defined by the MCP.

#### **D. Conclusions & Recommendations**

In order to address the aforementioned potential on-site and off-site PECs and RECs, and to determine the current condition of soil and groundwater at the site, a subsurface soil/groundwater sampling and analysis program was performed at the site on October 22, 2019. This testing program was performed at your request in order to address the REC and potential on-site and off-site threats of contamination identified in a “Phase I Environmental Site Assessment” report, dated August 31, 2018 by IES (Project No. 2018-08-0527). This program consisted of the advancement of six (6) test borings (B-1 through B-6) and the installation of three monitoring wells in borings B-1 (IES-1), B-2 (IES-2), and B-6 (IES-6). Existing monitoring wells (OW-2, MW-6, MW-3, MW-4, and MW-5A) were also identified at the site and sampled as part of this investigation. The program also included soil sample screening, and laboratory analysis of soil and groundwater samples.

The results of soil testing revealed no concentrations of any VPH or target VOCs, were identified in soil samples submitted for laboratory analysis above applicable RCS-1 standards. However, the concentrations of the PAH Benzo(a)pyrene in soil samples B-2/S-2 (5.5 mg/kg) and B-4/S-1 (5.7 mg/kg); the PAH Dibenz(a,h)anthracene in soil sample B-2/S-2 (1 mg/kg); and the PAH Phenanthrene in soil sample B-2/S-2 (15 mg/kg), are all above the applicable RCS-1 standards of 2 mg/kg, 0.7 mg/kg, and 10 mg/kg, respectively. Lead was identified in soil sample B-2/S-2 (863 mg/kg) and B-4/S-1 (697 mg/kg) above the applicable RCS-1 standard of 200 mg/kg. Further, the concentration of the EPH fraction in soil sample B-6/S-3 (1,200 mg/kg) is above the applicable RCS-1 standard of 1,000 mg/kg. Therefore, a reportable release to the soil was initially identified during this investigation.

However, pursuant to 310 CMR 40.0317(9), “releases of oil and/or hazardous material related to coal, coal ash, or wood ash, excluding wood ash resulting from the combustion of lumber or wood products that have been treated with chemical preservatives” do not require notification. Due to the identification of fill materials containing coal or asphalt at the site, IES’ Inc recommended submitting samples B-2/S-2 and B-4/S-1 for Coal Ash Analysis to confirm the presence of coal/coal ash in these fill materials. Should coal ash be confirmed to be present, the levels of Lead and PAHs may be considered “anthropogenic background” and thus exempt from reporting, as they are consistent with soil associated with fill material, as summarized in the DEP’s May 2002 “technical update – Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil”.

Due to visual evidence of fill materials including cobbles, porcelain, concrete, coal, and/or coal ash in the soil samples to a depth of up to 5-7.5 feet bgs, and an identification of elevated levels of the PAH Benzo(a)pyrene in soil samples B-2/S-2 (5.5 mg/kg) and B-4/S-1 (5.7 mg/kg); the PAH Dibenz(a,h)anthracene in soil sample B-2/S-2 (1 mg/kg); and the PAH Phenanthrene in soil sample B-2/S-2 (15 mg/kg); and Lead in soil samples B-2/S-2 (863 mg/kg) and B-4/S-1 (697 mg/kg), soil samples 2/S-2 and B-4/S-1 were submitted to Microvision Laboratories of Chelmsford, MA for Coal Ash Analysis.

The analysis detects and documents the presence of any coal, coal ash, asphalt, or wood ash that may be present in soil samples utilizing a combination of microscopy techniques including Polarized Light Microscopy (PLM) and Scanning Electron Microscopy with Energy Dispersive X-Ray Spectroscopy (SEM/EDS).

According to the Microvision report, two (2) suspect particles were identified in sample B-2/S-2. Microvision stated that the first “particle type consisted of over fifty (50+) shiny, black grains approximately 1-9mm in diameter” and “the PLM examination indicated this particle type to be consistent with coal.” The second “particle type consisted of twenty-four (24) dark, porous grains approximately 1-10mm in diameter”; and “the PLM examination indicated this particle type to be consistent with coal ash.”

According to the Microvision report, three (3) suspect particles were identified in sample B-4/S-1. Microvision stated that the first “particle type consisted of thirty-two to thirty-five (32-35) shiny, black grains approximately 1-13mm in diameter”; and “the PLM examination indicated this particle type to be consistent with coal”. The second “particle type consisted of four (4) dark, porous grains approximately 1-6mm in diameter”; and “the PLM examination indicated this particle type to be consistent with coal ash.” The third “particle type consisted of over fifty (50+) ductile, black grains approximately 1-12mm in diameter”; and “during the PLM examination, these particles slowly dissolved in the mounting oil which is a typical characteristic of asphalt.”

Therefore, pursuant to 310 CMR 40.0317(9), the presence of Benzo(a)pyrene, Dibenz(a,h)anthracene, Phenanthrene, and Lead in soil are considered “Releases and Threats of Releases Which Do Not Require Notification”, since it has been determined to be “releases of oil and/or hazardous material related to coal, coal ash, or wood ash, excluding wood ash resulting from the combustion of lumber or wood products that have been treated with chemical preservatives” do not require notification.

Furthermore, as previously discussed, the concentration of the EPH fraction in soil sample B-6/S-3 (1,200 mg/kg) is above the applicable RCS-1 standard of 1,000 mg/kg. A review of a “Response Action Outcome (RAO) Statement” report dated August 31, 1998, prepared by IES relative to the on-site State Disposal Site (RTN 3-3191), indicated that the general vicinity of B-6 was previously explored by IES in 1997 during removal of a former 500 gallon fuel oil UST. Confirmatory soil sampling from the excavation revealed TPH concentrations up to 2,100 mg/kg. While EPH and VPH testing was not performed in 1997, the current 2019 testing from B-6/S-3 revealed a TPH concentration of approximately 2,500 mg/kg. This is considered to be generally consistent with the previous concentrations identified in the 1998 RAO report from the subject site. Furthermore, it should be noted that no RCGW-2 exceedances of any Contaminants of Concern were identified in monitoring well IES-6 during the current subsurface investigation, as further discussed in this report. Pursuant to 310 CMR 40.0317: Releases and Threats of Release Which Do No Require Notification; (17) “releases indicated by the presence of oil and/or hazardous material at disposal sites for which a determination or statement as specified in 310 CMR 40.0317(17)(a) through (f) has been provided, in concentrations that would otherwise meet one or more of the sets of criteria set forth in 310 CMR 40.0313 or 40.0315, unless the presence of such oil and/or hazardous material would negate or change such determinations or statements were that presence taken into account in the preparation thereof, or changes in activities, uses, and/or exposures at the disposal site require notification to the Department pursuant to the provisions of 310 CMR 40.0020. In this context, determinations or statements include:” (b) “a disposal site where a Class A or Class B Response Action Outcome Statement has been submitted to the Department in compliance with the provisions of 310 CMR 40.1000.” Therefore, pursuant to 310

CMR 40.0317(17)(b), the concentration of the EPH fraction in soil sample B-6/S-3 (1,200 mg/kg), above the applicable RCS-1 standard of 1,000 mg/kg, is considered to be exempt from reporting.

The results of the groundwater testing revealed that there were no levels of any EPH, PAH, VPH, VOC compounds, or Metals identified in wells IES-1, IES-2, IES-6, OW-2, MW-3, MW-4, MW-5A, or MW-6, above applicable RCGW-2 standards. Therefore, a reportable release to the groundwater was **not** identified during this investigation.

Finally, based on the contents of this report, the findings of the aforementioned subsurface investigation, and the interpretation of the data above, no reportable conditions were identified in soil or groundwater at the subject site during this investigation. Therefore, IES, Inc. has no recommendations for further inquiry at the subject site, at this time. However, the soil at the site has been documented to contain contaminants or other anthropogenic materials, that if removed from the site, could potentially require special handling and/or disposal, and should be managed in accordance with applicable regulations including the MCP. The need for soil management would be dependent on the specific construction or development activities constructed at the site (if any). If site soils are to be excavated and transported for off-site disposal as part of future site construction or development activities, soil characterization would be warranted; and a "soil Management Plan" (SMP) and associated "Health & Safety Plan" (HASP) would also be recommended.

Respectfully submitted,  
IES, Inc.



Steve Iorio  
Project Manager

Reviewed by:



Kerry Asetta  
Vice President

**ATTACHMENT "A"**

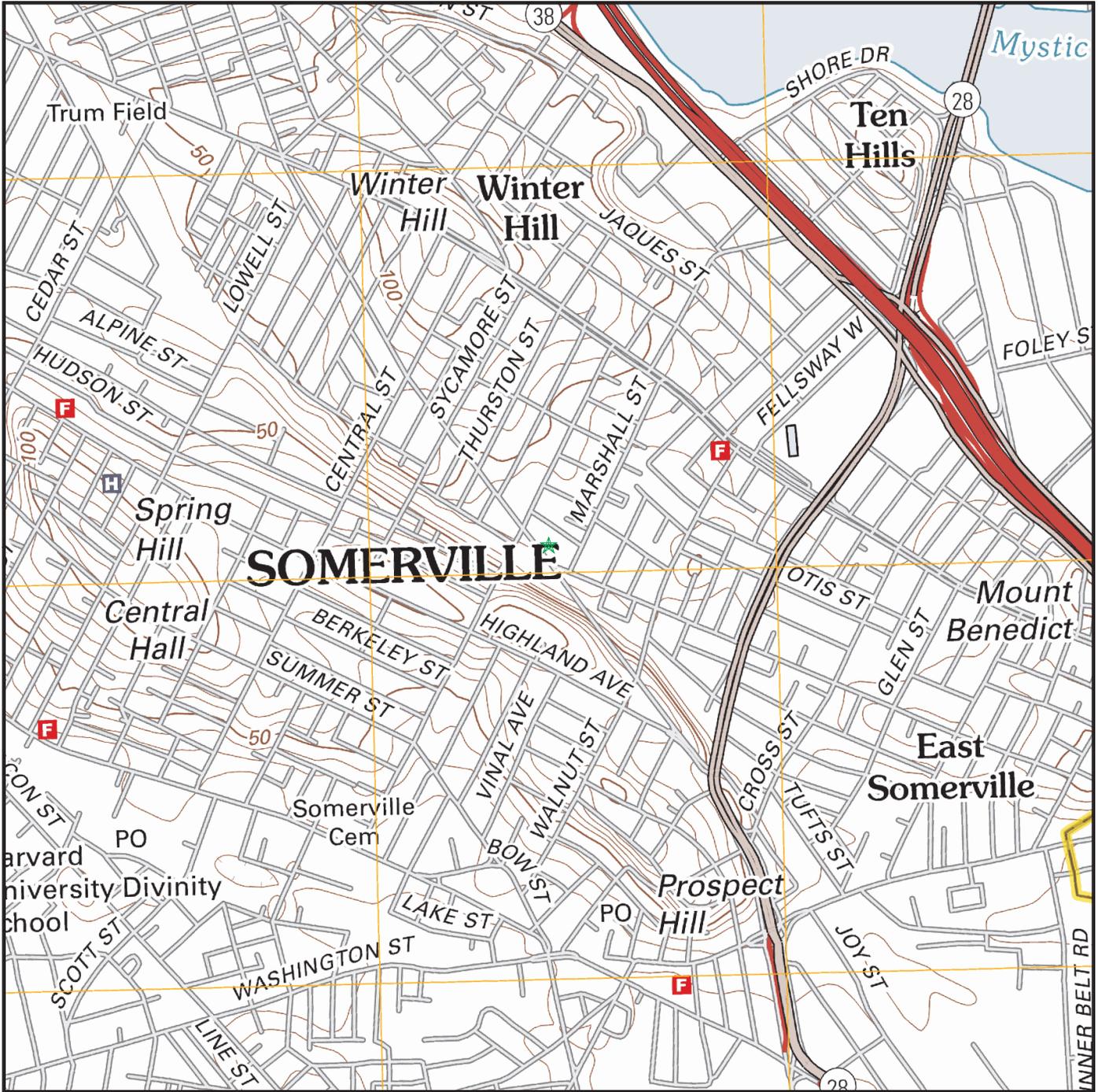
**Figures**

# Site location Map

Topo: 0.75 Mile Radius



345 MEDFORD STREET SOMERVILLE, MA 02145

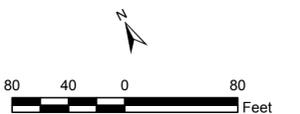
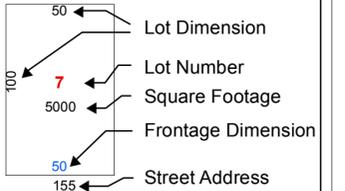


Map Image Position: TP  
Map Reference Code & Name: 5646197 Boston North  
Map State(s): MA  
Version Date: 2012



**Assessors Map**

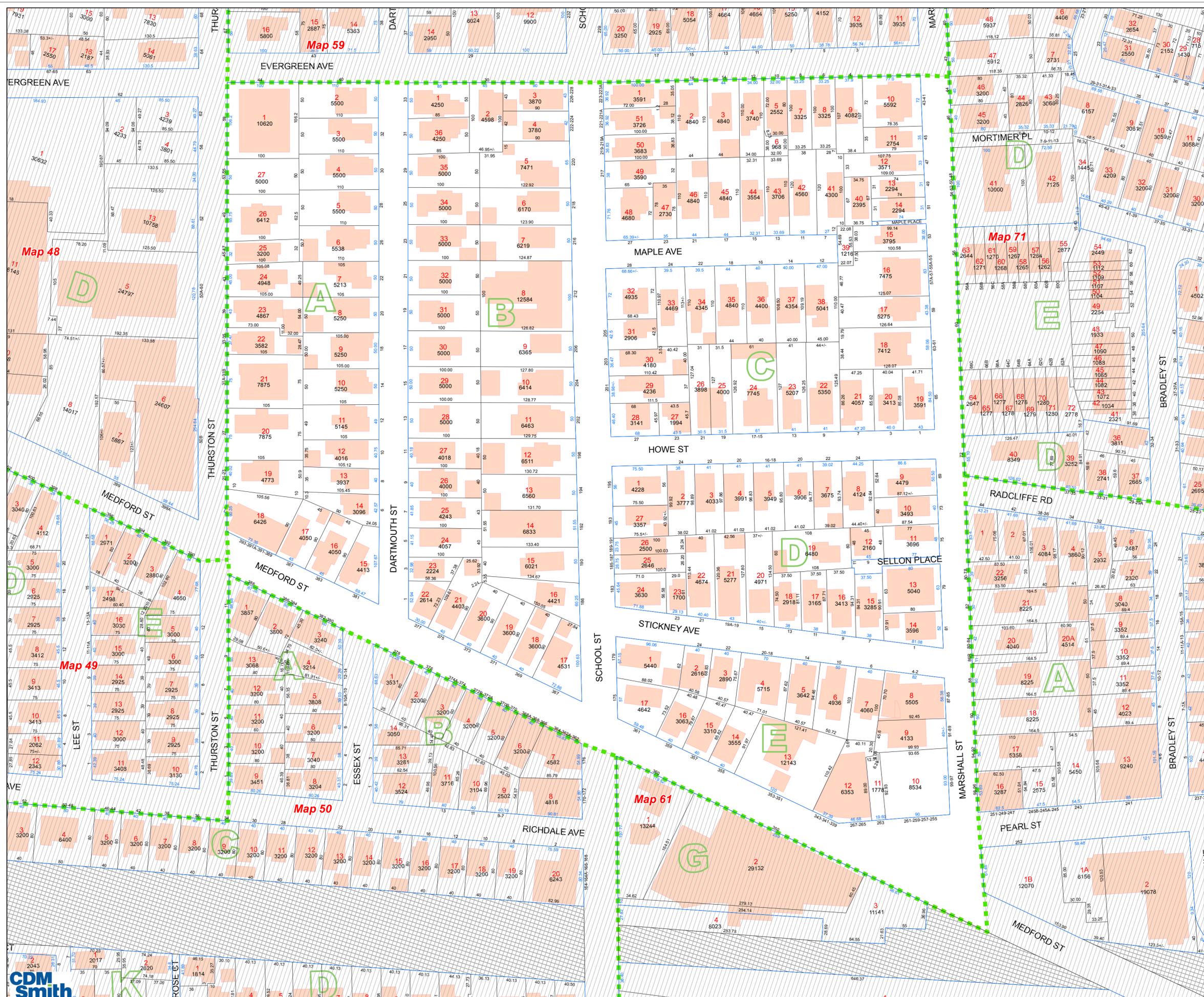
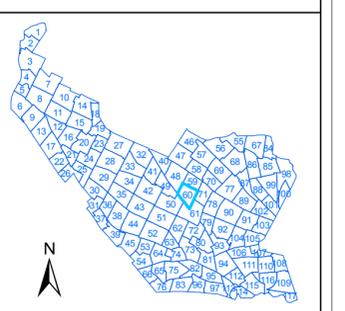
- Parcel Boundary
- Block/ROW Boundary
- Other ROW Boundary
- Assessor Map Boundary
- Water Body
- Building
- Railroad ROW

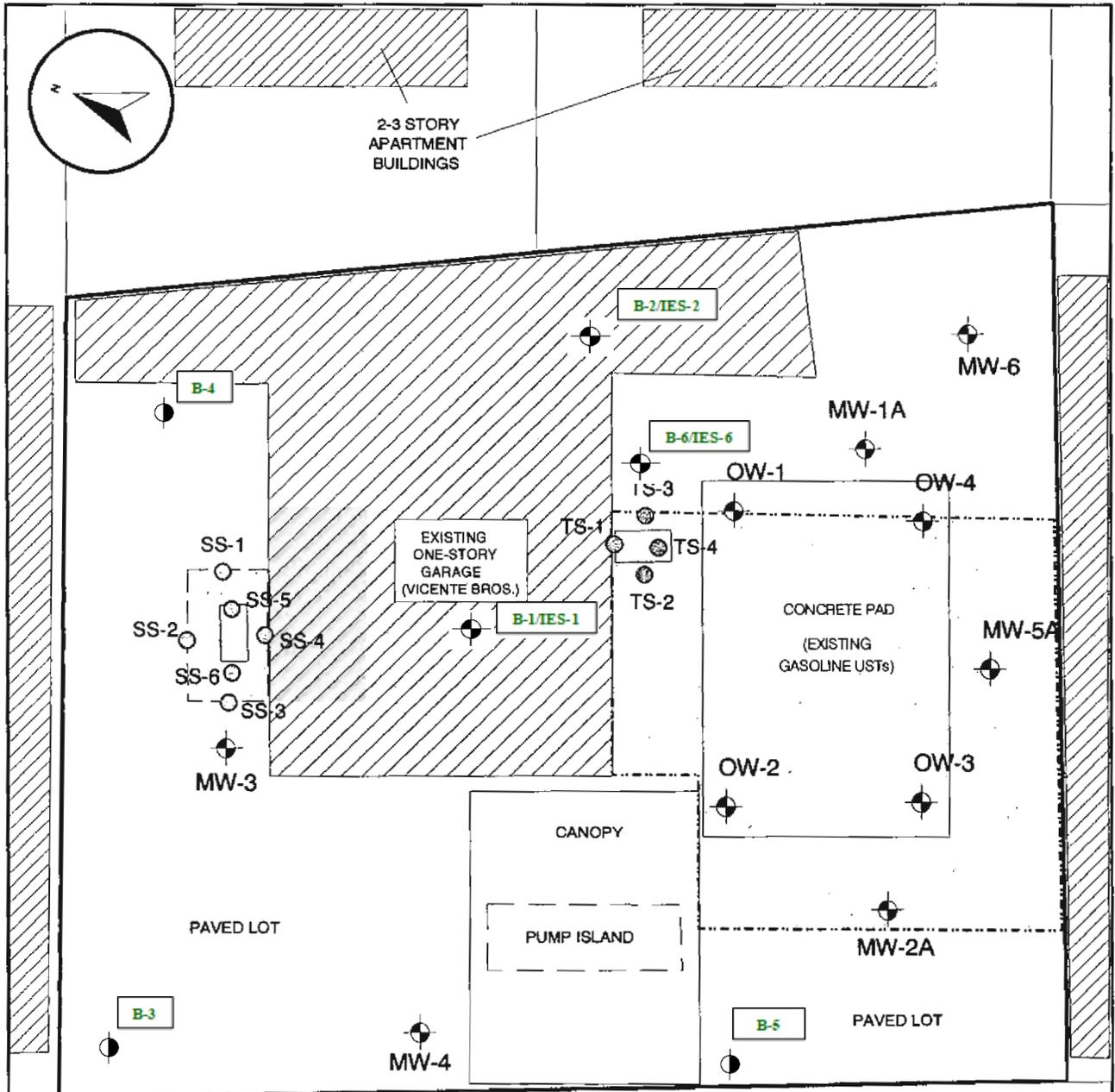


1" = 80'  
July 1, 2012

Sources: Rights-of-way and building footprints were originally developed from Boston Edison Company data, 1995 and have been updated by City of Somerville. Parcel data were originally developed from assessor maps by CDM Smith, 1999 and have been updated by CDM Smith based on City of Somerville records.

NOTE: The data represented on these maps indicate distances and deeded locations of cadastral boundaries in the City of Somerville. They are NOT survey data and should not be treated as such.





#347

#345

#343

**LEGEND**

-  FORMER UST
-  MONITORING WELL
-  SOIL SAMPLE LOCATION
-  FINAL LIMIT OF RAM EXCAVATION

MEDFORD STREET

**SITE PLAN**  
**346 MEDFORD STREET, SOMERVILLE, MA**  
**IES PROJECT No. 2018-08-0527**  
**OCTOBER 2019**



# MassDEP - Bureau of Waste Site Cleanup

## Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

### Site Information:

345 MEDFORD STREET SOMERVILLE, MA

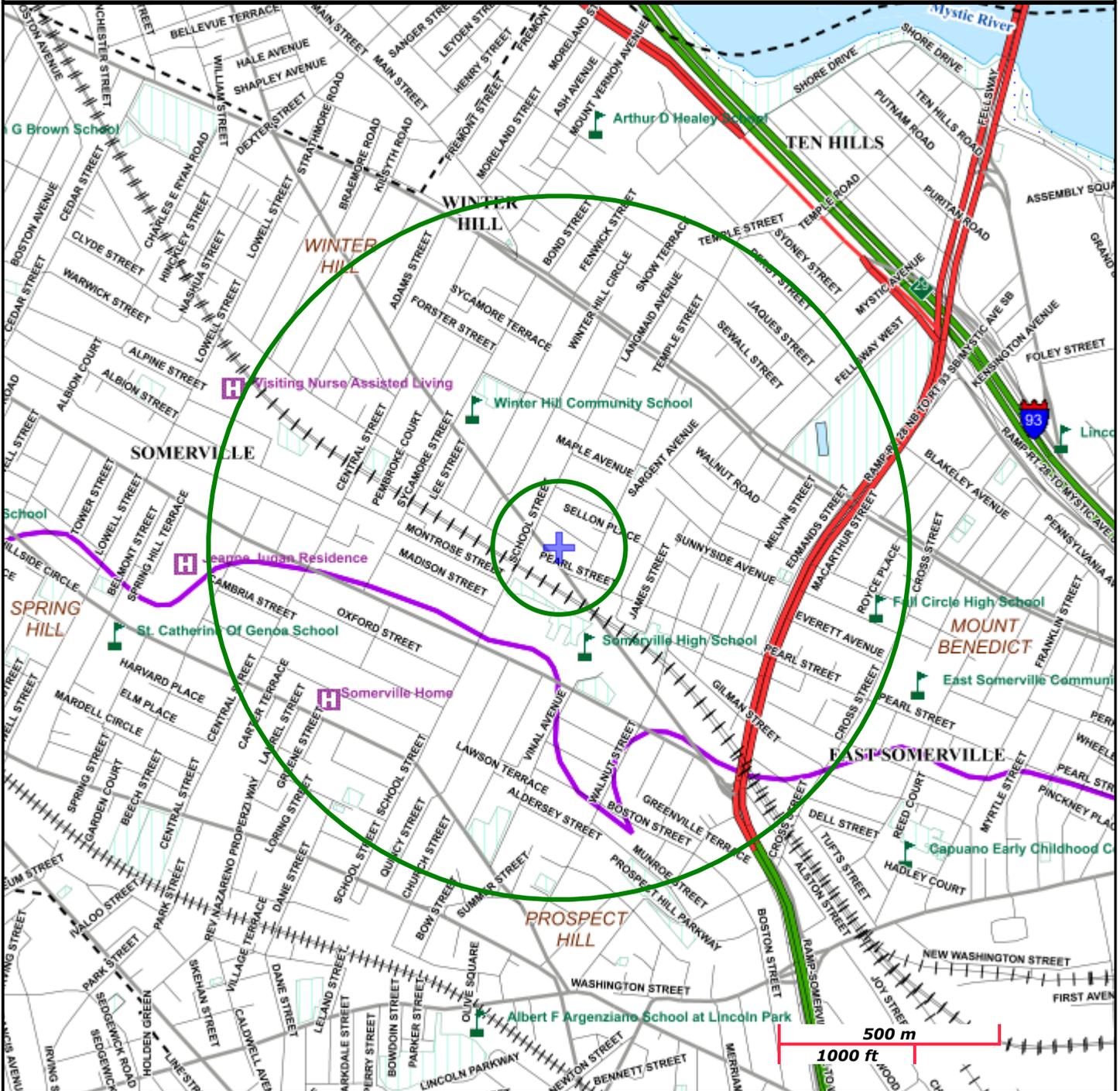
NAD83 UTM Meters:  
4695076mN , 327436mE (Zone: 19)  
December 2, 2019

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at:  
<https://www.mass.gov/orgs/massgis-bureau-of-geographic-information>.



# MassDEP

Commonwealth of Massachusetts  
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source

Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A

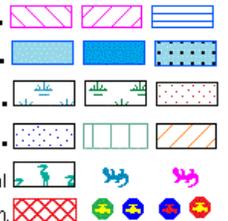
Hydrography: Open Water, PWS Reservoir, Tidal Flat

Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential

Solid Waste Landfill; PWS: Com. GW, SW, Emerg., Non-Com.



**ATTACHMENT "B"**

**Test Boring Logs**

TEST BORING LOG						(page 1 of 6)	
				Project #: 2018-08-0527 345 Medford Street Somerville, MA		Boring ID: <b>B-1/IES-1</b>	
Date Started: 10/22/19			Geologist: John Beck			Drilling Contractor: TDS	
Date Finished: 10/22/19			Project Manager: Steve Iorio				
Depth (feet)	Casing bl/ft	Sample				Strata	Visual Identification of Soil and/or Rock Sample
		No.	OVM	Depth	Blows/6"		
0		1	0.2	0'0" - 5'0"		15'	Concrete Slab in garage.  (rec. 2') 2" concrete over mixed FILL containing dry to damp, brn to gy sd w/ broken concrete and pebbles.
3							
6		2	6.8	5'0"-7'6"			(rec. 2'6") 1'6" of mixed, damp FILL containing buff to dk gy sand w/ rocks, concrete, coal, brick, metal and possible construction debris, over
9		3	265	7'6"-10'0"			1' of wet, gy, well-sorted, loose, medium-grained SAND w/ mica. Gasoline odor and black staining at top.
		4	4.2	10'0" - 13'0"			(rec. 4'6") Wet, gy, well-sorted SAND AS ABOVE, over
12							
15		5	0.1	13'0" - 15'0"			Wet, gy, dense, plastic CLAY.
<hr/> End of probe at 15' 0". Groundwater encountered at approx. 8'. Set monitoring well at 15'. 10' of well screen.							
Rig: Track-mounted, percussion hammer driving system (geoprobe 6610) Sampling Equipment: 1 <sup>3</sup> / <sub>8</sub> " diameter stainless-steel sampling tube. OVM: Organic Vapor Meter reading measured in parts per million; benzene calibration standard							
Cohesionless: 0-4 = Very Loose; 4-10 = Loose; 10-30 = Medium Dense; 30-50 = Dense; 50+ = Very Dense Cohesive: 0-2 = Very Soft; 2-4 = Soft; 4-8 = Medium Stiff; 8-15 = Stiff; 15-30 = Very Stiff; 30+ = Hard					Trace: 0% - 10% Little: 10% - 20% Some: 20% - 35% And: 35% - 50%		

# TEST BORING LOG

(page 2 of 6)



Project #: 2018-08-0527  
345 Medford Street  
Somerville, MA

Boring ID:  
**B-2/IES-2**

Date Started: 10/22/19

Geologist: John Beck

Drilling Contractor:

Date Finished: 10/22/19

Project Manager: Steve Iorio

TDS

Depth (feet)	Casing bl/ft	Sample				Strata	Visual Identification of Soil and/or Rock Sample
		No.	OVM	Depth	Blows/6"		
0		1	0.2	0'0" - 2'6"		Concrete Slab in garage.  (rec. 4'6") Dry, mixed urban FILL containing brn, dk brn, buff, green sand, loam, coal ash, rocks and concrete, over	
3		2	0	2'6"-5'0"		Dry to damp, mixed FILL containing brn, rusty brn, gy, black, fine SAND, clay and pebbles w/ 2" thick layer of coal cinders at 3'8" below grade.	
6		3	0	5'0"-8'0"	14'	(rec. 4') Damp, brn, clay-rich, slightly plastic, fine grained SAND w/ red, oxidized laminations, over	
9		4	0	8'0" - 10'0"		Wet, gy, well-sorted, loose, medium-grained SAND w/ mica. Dk gy organic staining at bottom.	
12		5	0.2	10'0" - 14'0"		(Core barrel jammed) Wet, brn to gy, loose SAND AS ABOVE over 2' of wet, gy, silty, CLAY w/ organics.	
15						End of probe at 15' 0". Groundwater encountered at approx. 8'. Set monitoring well at 15'. 10' of well screen.	

Rig: Track-mounted, percussion hammer driving system (geoprobe 6610)

Sampling Equipment: 1<sup>3</sup>/<sub>8</sub>" diameter stainless-steel sampling tube.

OVM: Organic Vapor Meter reading measured in parts per million; benzene calibration standard

Cohesionless: 0-4 = Very Loose; 4-10 = Loose;  
10-30 = Medium Dense; 30-50 = Dense; 50+ = Very Dense  
Cohesive: 0-2 = Very Soft; 2-4 = Soft; 4-8 = Medium Stiff;  
8-15 = Stiff; 15-30 = Very Stiff; 30+ = Hard

Trace: 0% - 10%  
Little: 10% - 20%  
Some: 20% - 35%  
And: 35% - 50%

# TEST BORING LOG

(page 3 of 6)



Project #: 2018-08-0527  
345 Medford Street  
Somerville, MA

Boring ID:  
**B-3**

Date Started: 10/22/19

Geologist: John Beck

Drilling Contractor:

Date Finished: 10/22/19

Project Manager: Steve Iorio

TDS

Depth (feet)	Casing bl/ft	Sample				Strata	Visual Identification of Soil and/or Rock Sample
		No.	OVM	Depth	Blows/6"		
0		1	0	0'0" - 5'0"		Asphalt.  (rec. 4') Dry, mixed FILL containing lt brn to gy medium-grained sand w/ scattered rocks, brick and possible coal or asphalt in top 2'.	
3							
6		2	0	5'0"-7'6"	10'	(rec. 4'6") 1'6" of damp, brn, clay-rich, fine SAND w/ occ. rocks, over 1' of very dark brn fine SAND or SILT, over	
9		3	0	7'6"-10'0"		1' of wet, gy to rusty brn, loose SAND, over 1' of wet, gy, silty-clay with organics.	
12						End of probe at 10' 0". Groundwater encountered at 7'6". Boring back-filled after sampling.	
15							

Rig: Track-mounted, percussion hammer driving system (geoprobe 6610)

Sampling Equipment: 1<sup>3</sup>/<sub>8</sub>" diameter stainless-steel sampling tube.

OVM: Organic Vapor Meter reading measured in parts per million; benzene calibration standard

Cohesionless: 0-4 = Very Loose; 4-10 = Loose;  
10-30 = Medium Dense; 30-50 = Dense; 50+ = Very Dense  
Cohesive: 0-2 = Very Soft; 2-4 = Soft; 4-8 = Medium Stiff;  
8-15 = Stiff; 15-30 = Very Stiff; 30+ = Hard

Trace: 0% – 10%  
Little: 10% – 20%  
Some: 20% – 35%  
And: 35% – 50%

TEST BORING LOG						(page 4 of 6)	
				Project #: 2018-08-0527 345 Medford Street Somerville, MA		Boring ID: <b>B-4</b>	
Date Started: 10/22/19			Geologist: John Beck		Drilling Contractor: TDS		
Date Finished: 10/22/19			Project Manager: Steve Iorio				
Depth (feet)	Casing bl/ft	Sample				Strata	Visual Identification of Soil and/or Rock Sample
		No.	OVM	Depth	Blows/6"		
0		1	0	0'0" - 4'0"		Asphalt.  (rec. 3') Asphalt over dry, mixed FILL containing 2' of dk gy to black sand, coal, pebbles and construction debris, over	
3		2	0	4'0"-5'0"	10'	1' of damp, brn, clay-rich, fine-grained SAND w/ rocks. (rec. 4') 6" of damp, brn, clay-rich, fine SAND AS ABOVE, over 6" of black, organic SILT, over Wet, gy, loose, medium-grained SAND w/ mica and black staining at the top, over  2'6" of wet, gy, plastic, CLAY w/ oxidized organics.  End of probe at 10' 0". Groundwater encountered at 7'6". Boring back-filled after sampling.	
		3	0.1	5'0"-6'0"			
6		4	0.1	6'0" - 7'6"			
9		5	0	7'6" - 10'0"			
12							
15							
Rig: Track-mounted, percussion hammer driving system (geoprobe 6610) Sampling Equipment: 1 <sup>3</sup> / <sub>8</sub> " diameter stainless-steel sampling tube. OVM: Organic Vapor Meter reading measured in parts per million; benzene calibration standard							
Cohesionless: 0-4 = Very Loose; 4-10 = Loose; 10-30 = Medium Dense; 30-50 = Dense; 50+ = Very Dense Cohesive: 0-2 = Very Soft; 2-4 = Soft; 4-8 = Medium Stiff; 8-15 = Stiff; 15-30 = Very Stiff; 30+ = Hard					Trace: 0% - 10% Little: 10% - 20% Some: 20% - 35% And: 35% - 50%		

TEST BORING LOG							(page 5 of 6)
				Project #: 2018-08-0527 345 Medford Street Somerville, MA		Boring ID: <b>B-5</b>	
Date Started: 10/22/19			Geologist: John Beck		Drilling Contractor: TDS		
Date Finished: 10/22/19			Project Manager: Steve Iorio				
Depth (feet)	Casing bl/ft	Sample				Strata	Visual Identification of Soil and/or Rock Sample
		No.	OVM	Depth	Blows/6"		
0		1	0	0'0" - 5'0"		Asphalt  (rec. 1'6") Dry to damp, black to gy to brn FILL containing coal, brick, and medium-grained SAND w/ pebbles.	
3							
6		2	0	5'0"-7'6"	10'	(rec. 2'6") Damp brn, plastic, clay-rich SAND over black, organic, fine SAND and silt, over	
		3A	1.2	7'6" - 8'6"		Wet, gy, loose, medium-grained SAND w/ mica and slight organic odor, over	
9		3B	0	8'6" - 10'0"		Wet to dry, gy, dense, plastic CLAY w/ organics and silty CLAY.	
12						<hr/> End of probe at 10' 0". Groundwater encountered at approx. 7'6". Boring back-filled after sampling.	
15							
Rig: Track-mounted, percussion hammer driving system (geoprobe 6610) Sampling Equipment: 1 <sup>3</sup> / <sub>8</sub> " diameter stainless-steel sampling tube. OVM: Organic Vapor Meter reading measured in parts per million; benzene calibration standard							
Cohesionless: 0-4 = Very Loose; 4-10 = Loose; 10-30 = Medium Dense; 30-50 = Dense; 50+ = Very Dense Cohesive: 0-2 = Very Soft; 2-4 = Soft; 4-8 = Medium Stiff; 8-15 = Stiff; 15-30 = Very Stiff; 30+ = Hard					Trace: 0% - 10% Little: 10% - 20% Some: 20% - 35% And: 35% - 50%		

TEST BORING LOG						(page 6 of 6)	
				Project #: 2018-08-0527 345 Medford Street Somerville, MA		Boring ID: <b>B-6/IES-6</b>	
Date Started: 10/22/19			Geologist: John Beck		Drilling Contractor: TDS		
Date Finished: 10/22/19			Project Manager: Steve Iorio				
Depth (feet)	Casing bl/ft	Sample				Strata	Visual Identification of Soil and/or Rock Sample
		No.	OVM	Depth	Blows/6"		
0		1	0	0'0" - 5'0"		Asphalt.  (rec. 3') Asphalt over dry, mixed FILL containing lt brn to brn sand, coal, ash and pebbles.	
3							
6		2	9.0	5'0"-7'6"	13'	(rec. 3'6") Damp, brn, plastic, clay-rich, fine SAND over black, organic-rich, fine SAND, over	
9		3	136	7'6"-10'0"		Wet, gy, loose, medium-grained SAND w/ mica and black staining. Oil odor.	
		4	63	10'0" - 11'0"		Wet, gy SAND AS ABOVE w/ oil odor and oil sheen.	
12		5	6.5	11'0" - 13'0"		Dry, dense, plastic, gy CLAY w/ organics.	
15						End of probe at 15' 0". Groundwater encountered at approx. 8'. Set monitoring well at 15'. 10' of well screen.	
Rig: Track-mounted, percussion hammer driving system (geoprobe 6610) Sampling Equipment: 1 <sup>3</sup> / <sub>8</sub> " diameter stainless-steel sampling tube. OVM: Organic Vapor Meter reading measured in parts per million; benzene calibration standard							
Cohesionless: 0-4 = Very Loose; 4-10 = Loose; 10-30 = Medium Dense; 30-50 = Dense; 50+ = Very Dense Cohesive: 0-2 = Very Soft; 2-4 = Soft; 4-8 = Medium Stiff; 8-15 = Stiff; 15-30 = Very Stiff; 30+ = Hard					Trace: 0% - 10% Little: 10% - 20% Some: 20% - 35% And: 35% - 50%		

**ATTACHMENT “C”**

**Laboratory Results**



Friday, November 01, 2019

Attn: Steve Iorio  
IES, Inc.  
50 Salem Street, Building A-Suite 108  
Lynnfield, MA 01940

Project ID: 345 MEDFORD ST, SOMERVILLE  
SDG ID: GCE46525  
Sample ID#s: CE46525 - CE46530

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style.

Phyllis/Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #M-CT007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
UT Lab Registration #CT00007  
VT Lab Registration #VT11301



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



## SDG Comments

November 01, 2019

SDG I.D.: GCE46525

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Phoenix reporting levels may exceed those referenced in the CAM protocol. Please refer to criteria sheet for comparisons to requested MCP standards.



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Tel. (860) 645-1102 Fax (860) 645-0823

## Sample Id Cross Reference

November 01, 2019

SDG I.D.: GCE46525

Project ID: 345 MEDFORD ST, SOMERVILLE

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Client Id	Lab Id	Matrix
IES-1/S-2	CE46525	SOIL
IES-1/S-3	CE46526	SOIL
IES-2/S-2	CE46527	SOIL
B-4/S-1	CE46528	SOIL
B-5/S-3A	CE46529	SOIL
IES-6/S-3	CE46530	SOIL



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 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 01, 2019

FOR: Attn: Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: SOIL  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: CP  
 Analyzed by: see "By" below

Date

10/22/19  
 10/23/19

Time

8:00  
 16:32

Laboratory Data

SDG ID: GCE46525  
 Phoenix ID: CE46525

Project ID: 345 MEDFORD ST, SOMERVILLE  
 Client ID: IES-1/S-2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.38	0.38	mg/Kg	1	10/24/19	EK	SW6010D
Arsenic	6.34	0.75	mg/Kg	1	10/24/19	EK	SW6010D
Barium	81.3	0.38	mg/Kg	1	10/24/19	EK	SW6010D
Cadmium	0.77	0.38	mg/Kg	1	10/24/19	EK	SW6010D
Chromium	18.2	0.38	mg/Kg	1	10/24/19	EK	SW6010D
Mercury	0.10	0.03	mg/Kg	2	10/24/19	RS	SW7471B
Lead	106	0.38	mg/Kg	1	10/24/19	EK	SW6010D
Selenium	< 1.5	1.5	mg/Kg	1	10/24/19	EK	SW6010D
Percent Solid	91		%		10/23/19	VT	SW846-%Solid
Soil Extraction SVOA PAH	Completed				10/23/19	RR/E	SW3545A
Mercury Digestion	Completed				10/24/19	LS/LS	SW7471B
Total Metals Digest	Completed				10/23/19	B/AG/BF	SW3050B

**Polynuclear Aromatic HC**

2-Methylnaphthalene	0.44	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Acenaphthene	ND	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Acenaphthylene	0.54	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Anthracene	0.28	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Benz(a)anthracene	1	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(a)pyrene	1.2	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(b)fluoranthene	0.98	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(ghi)perylene	0.92	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(k)fluoranthene	1	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Chrysene	1.1	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Dibenz(a,h)anthracene	ND	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Fluoranthene	1.7	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Fluorene	ND	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Indeno(1,2,3-cd)pyrene	1.1	0.25	mg/Kg	1	10/24/19	WB	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Naphthalene	0.53	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Phenanthrene	0.65	0.25	mg/Kg	1	10/24/19	WB	SW8270D
Pyrene	1.8	0.25	mg/Kg	1	10/24/19	WB	SW8270D
<b><u>QA/QC Surrogates</u></b>							
% 2-Fluorobiphenyl	61		%	1	10/24/19	WB	30 - 130 %
% Nitrobenzene-d5	87		%	1	10/24/19	WB	30 - 130 %
% Terphenyl-d14	88		%	1	10/24/19	WB	30 - 130 %

Massachusetts does not offer certification for Soil/Solid matrices.

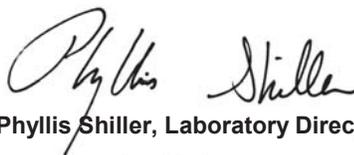
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



**Phyllis Shiller, Laboratory Director**

**November 01, 2019**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 01, 2019

FOR: Attn: Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: SOIL  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: CP  
 Analyzed by: see "By" below

Date

10/22/19  
 10/23/19

Time

8:30  
 16:32

Laboratory Data

SDG ID: GCE46525  
 Phoenix ID: CE46526

Project ID: 345 MEDFORD ST, SOMERVILLE  
 Client ID: IES-1/S-3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	82		%		10/23/19	VT	SW846-%Solid
Soil Extraction SVOA PAH	Completed				10/23/19	RR/E	SW3545A
EPH Extraction	Completed				10/23/19	MB/AK	SW3545A
Ext. Petroleum Hydrocarbons	Completed				10/23/19		MADEP EPH-04
MA Petroleum Hydrocarbon (VPH)	Completed				10/25/19	RM	MADEP VPH04

EPH Other PAH Target Analytes

Acenaphthylene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Anthracene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benz(a)anthracene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(a)pyrene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(b)fluoranthene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(ghi)perylene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(k)fluoranthene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Chrysene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Dibenz(a,h)anthracene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Fluoranthene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Fluorene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Indeno(1,2,3-cd)pyrene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Pyrene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004

QA/QC Surrogates

% 2-Fluorobiphenyl	56		%	1	10/24/19	WB	30 - 130 %
% Nitrobenzene-d5	78		%	1	10/24/19	WB	30 - 130 %
% Terphenyl-d14	73		%	1	10/24/19	WB	30 - 130 %

EPH Diesel PAH Target Analytes

2-Methylnaphthalene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Acenaphthene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Naphthalene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Phenanthrene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004

**MA EPH Aliphatic/Aromatic Ranges**

C11-C22 Aromatic Hydrocarbons 1,2*	ND	80	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
C11-C22 Aromatic Hydrocarbons Unadj	ND	80	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	ND	80	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	ND	80	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
Total TPH 1,2*	ND	80	mg/Kg	1	10/25/19	AW	MA EPH 5/2004

**QA/QC Surrogates**

% 1-chlorooctadecane (aliphatic)	96		%	1	10/25/19	AW	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	114		%	1	10/25/19	AW	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	121		%	1	10/25/19	AW	40 - 140 %
% o-terphenyl (aromatic)	97		%	1	10/25/19	AW	40 - 140 %

**MA Volatile Petroleum Hydrocarbons (VPH)**

Unadjusted C5-C8 Aliphatics (*1)	ND	6.1	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
Unadjusted C9-C12 Aliphatics (*1)	26	6.1	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
C5-C8 Aliphatic Hydrocarbons *1,2	ND	6.1	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
C9-C12 Aliphatic Hydrocarbons *1,3	14	6.1	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
C9-C10 Aromatic Hydrocarbons *1	11	6.1	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
Benzene	ND	0.031	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
Ethyl Benzene	ND	0.061	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
MTBE	ND	0.061	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
Naphthalene	ND	0.31	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
Toluene	ND	0.061	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
m,p-Xylenes	ND	0.061	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
o-Xylene	ND	0.061	mg/Kg	50	10/25/19	RM	MA VPH 5/2004

**QA/QC Surrogates**

% 2,5-Dibromotoluene (FID)	118		%	50	10/25/19	RM	70 - 130 %
% 2,5-Dibromotoluene (PID)	114		%	50	10/25/19	RM	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

MAEPH:

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C22 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

VPH:

\*1 Range data exclude concentrations of any surrogate(s) and/or Internal stds eluting in that range.

\*2 C5-C8 and C9-C12 Aliphatic exclude the conc. of Target Analytes in that range.

\*3 C9-C12 Aliphatic also exclude C9-C10 Aromatic Hydrocarbons.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.

The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



**Phyllis Shiller, Laboratory Director**

**November 01, 2019**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 01, 2019

FOR: Attn: Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: SOIL  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: CP  
 Analyzed by: see "By" below

Date            Time  
 10/22/19            9:00  
 10/23/19            16:32

Laboratory Data

SDG ID: GCE46525  
 Phoenix ID: CE46527

Project ID: 345 MEDFORD ST, SOMERVILLE  
 Client ID: IES-2/S-2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.35	0.35	mg/Kg	1	10/24/19	EK	SW6010D
Arsenic	9.85	0.70	mg/Kg	1	10/24/19	EK	SW6010D
Barium	102	0.35	mg/Kg	1	10/24/19	EK	SW6010D
Cadmium	0.79	0.35	mg/Kg	1	10/24/19	EK	SW6010D
Chromium	16.2	0.35	mg/Kg	1	10/24/19	EK	SW6010D
Mercury	0.18	0.03	mg/Kg	2	10/24/19	RS	SW7471B
Lead	863	3.5	mg/Kg	10	10/25/19	EK	SW6010D
Selenium	< 1.4	1.4	mg/Kg	1	10/24/19	EK	SW6010D
Percent Solid	87		%		10/23/19	VT	SW846-%Solid
Soil Extraction SVOA PAH	Completed				10/23/19	RR/E	SW3545A
Mercury Digestion	Completed				10/24/19	LS/LS	SW7471B
Total Metals Digest	Completed				10/23/19	B/AG/BF	SW3050B

**Polynuclear Aromatic HC**

2-Methylnaphthalene	0.42	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Acenaphthene	1.3	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Acenaphthylene	0.64	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Anthracene	5	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Benz(a)anthracene	6.4	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(a)pyrene	5.5	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(b)fluoranthene	5.2	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(ghi)perylene	3.3	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(k)fluoranthene	3.7	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Chrysene	5.7	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Dibenz(a,h)anthracene	1	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Fluoranthene	13	2.6	mg/Kg	10	10/25/19	WB	SW8270D
Fluorene	2.2	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Indeno(1,2,3-cd)pyrene	4	0.26	mg/Kg	1	10/24/19	WB	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Naphthalene	0.43	0.26	mg/Kg	1	10/24/19	WB	SW8270D
Phenanthrene	15	2.6	mg/Kg	10	10/25/19	WB	SW8270D
Pyrene	11	2.6	mg/Kg	10	10/25/19	WB	SW8270D
<b><u>QA/QC Surrogates</u></b>							
% 2-Fluorobiphenyl	59		%	1	10/24/19	WB	30 - 130 %
% Nitrobenzene-d5	75		%	1	10/24/19	WB	30 - 130 %
% Terphenyl-d14	79		%	1	10/24/19	WB	30 - 130 %
% 2-Fluorobiphenyl (10x)	Diluted Out		%	10	10/25/19	WB	30 - 130 %
% Nitrobenzene-d5 (10x)	Diluted Out		%	10	10/25/19	WB	30 - 130 %
% Terphenyl-d14 (10x)	Diluted Out		%	10	10/25/19	WB	30 - 130 %

Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



**Phyllis Shiller, Laboratory Director**

**November 01, 2019**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 01, 2019

FOR: Attn: Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: SOIL  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: CP  
 Analyzed by: see "By" below

Date

10/22/19  
 10/23/19

Time

11:00  
 16:32

Laboratory Data

SDG ID: GCE46525  
 Phoenix ID: CE46528

Project ID: 345 MEDFORD ST, SOMERVILLE  
 Client ID: B-4/S-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.38	0.38	mg/Kg	1	10/24/19	EK	SW6010D
Arsenic	10.2	0.76	mg/Kg	1	10/24/19	EK	SW6010D
Barium	156	0.38	mg/Kg	1	10/24/19	EK	SW6010D
Cadmium	3.68	0.38	mg/Kg	1	10/24/19	EK	SW6010D
Chromium	17.8	0.38	mg/Kg	1	10/24/19	EK	SW6010D
Mercury	0.26	0.08	mg/Kg	5	10/24/19	RS	SW7471B
Lead	697	0.38	mg/Kg	1	10/24/19	EK	SW6010D
Selenium	< 1.5	1.5	mg/Kg	1	10/24/19	EK	SW6010D
Percent Solid	86		%		10/23/19	VT	SW846-%Solid
Soil Extraction SVOA PAH	Completed				10/23/19	RR/E	SW3545A
Mercury Digestion	Completed				10/24/19	LS/LS	SW7471B
Total Metals Digest	Completed				10/23/19	B/AG/BF	SW3050B

**Polynuclear Aromatic HC**

2-Methylnaphthalene	0.33	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Acenaphthene	0.87	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Acenaphthylene	0.82	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Anthracene	2.3	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Benz(a)anthracene	5.9	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(a)pyrene	5.7	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(b)fluoranthene	5.1	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(ghi)perylene	4.1	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Benzo(k)fluoranthene	4.2	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Chrysene	5.8	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Dibenz(a,h)anthracene	0.34	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Fluoranthene	12	2.7	mg/Kg	10	10/25/19	WB	SW8270D
Fluorene	1	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Indeno(1,2,3-cd)pyrene	4.7	0.27	mg/Kg	1	10/24/19	WB	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Naphthalene	0.48	0.27	mg/Kg	1	10/24/19	WB	SW8270D
Phenanthrene	10	2.7	mg/Kg	10	10/25/19	WB	SW8270D
Pyrene	9.8	2.7	mg/Kg	10	10/25/19	WB	SW8270D
<b><u>QA/QC Surrogates</u></b>							
% 2-Fluorobiphenyl	51		%	1	10/24/19	WB	30 - 130 %
% Nitrobenzene-d5	68		%	1	10/24/19	WB	30 - 130 %
% Terphenyl-d14	61		%	1	10/24/19	WB	30 - 130 %
% 2-Fluorobiphenyl (10x)	Diluted Out		%	10	10/25/19	WB	30 - 130 %
% Nitrobenzene-d5 (10x)	Diluted Out		%	10	10/25/19	WB	30 - 130 %
% Terphenyl-d14 (10x)	Diluted Out		%	10	10/25/19	WB	30 - 130 %

Massachusetts does not offer certification for Soil/Solid matrices.

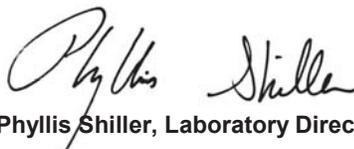
RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



**Phyllis Shiller, Laboratory Director**

**November 01, 2019**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 01, 2019

FOR: Attn: Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: SOIL  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: CP  
 Analyzed by: see "By" below

Date            Time  
 10/22/19        13:00  
 10/23/19        16:32

Laboratory Data

SDG ID: GCE46525  
 Phoenix ID: CE46529

Project ID: 345 MEDFORD ST, SOMERVILLE  
 Client ID: B-5/S-3A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	85		%		10/23/19	VT	SW846-%Solid
Soil Extraction SVOA PAH	Completed				10/23/19	RR/E	SW3545A
EPH Extraction	Completed				10/23/19	MB/AK	SW3545A
Ext. Petroleum Hydrocarbons	Completed				10/23/19		MADEP EPH-04
MA Petroleum Hydrocarbon (VPH)	Completed				10/25/19	RM	MADEP VPH04

EPH Other PAH Target Analytes

Acenaphthylene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Anthracene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benz(a)anthracene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(a)pyrene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(b)fluoranthene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(ghi)perylene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(k)fluoranthene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Chrysene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Dibenz(a,h)anthracene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Fluoranthene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Fluorene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Indeno(1,2,3-cd)pyrene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Pyrene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004

QA/QC Surrogates

% 2-Fluorobiphenyl	54		%	1	10/24/19	WB	30 - 130 %
% Nitrobenzene-d5	62		%	1	10/24/19	WB	30 - 130 %
% Terphenyl-d14	78		%	1	10/24/19	WB	30 - 130 %

EPH Diesel PAH Target Analytes

2-Methylnaphthalene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Acenaphthene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Naphthalene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Phenanthrene	ND	0.27	mg/Kg	1	10/24/19	WB	MA EPH 5/2004

**MA EPH Aliphatic/Aromatic Ranges**

C11-C22 Aromatic Hydrocarbons 1,2*	ND	77	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
C11-C22 Aromatic Hydrocarbons Unadj	ND	77	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	ND	77	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	ND	77	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
Total TPH 1,2*	ND	77	mg/Kg	1	10/25/19	AW	MA EPH 5/2004

**QA/QC Surrogates**

% 1-chlorooctadecane (aliphatic)	86		%	1	10/25/19	AW	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	105		%	1	10/25/19	AW	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	109		%	1	10/25/19	AW	40 - 140 %
% o-terphenyl (aromatic)	87		%	1	10/25/19	AW	40 - 140 %

**MA Volatile Petroleum Hydrocarbons (VPH)**

Unadjusted C5-C8 Aliphatics (*1)	ND	8.1	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
Unadjusted C9-C12 Aliphatics (*1)	ND	8.1	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
C5-C8 Aliphatic Hydrocarbons *1,2	ND	8.1	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
C9-C12 Aliphatic Hydrocarbons *1,3	ND	8.1	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
C9-C10 Aromatic Hydrocarbons *1	ND	8.1	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
Benzene	ND	0.040	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
Ethyl Benzene	ND	0.081	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
MTBE	ND	0.081	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
Naphthalene	ND	0.40	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
Toluene	ND	0.081	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
m,p-Xylenes	ND	0.081	mg/Kg	50	10/25/19	RM	MA VPH 5/2004
o-Xylene	ND	0.081	mg/Kg	50	10/25/19	RM	MA VPH 5/2004

**QA/QC Surrogates**

% 2,5-Dibromotoluene (FID)	119		%	50	10/25/19	RM	70 - 130 %
% 2,5-Dibromotoluene (PID)	118		%	50	10/25/19	RM	70 - 130 %

Client ID: B-5/S-3A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

MAEPH:

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C22 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

VPH:

\*1 Range data exclude concentrations of any surrogate(s) and/or Internal stds eluting in that range.

\*2 C5-C8 and C9-C12 Aliphatic exclude the conc. of Target Analytes in that range.

\*3 C9-C12 Aliphatic also exclude C9-C10 Aromatic Hydrocarbons.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.

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**Phyllis Shiller, Laboratory Director**

**November 01, 2019**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 01, 2019

FOR: Attn: Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: SOIL  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by:  
 Received by: CP  
 Analyzed by: see "By" below

Date            Time  
 10/22/19          14:00  
 10/23/19          16:32

Laboratory Data

SDG ID: GCE46525  
 Phoenix ID: CE46530

Project ID: 345 MEDFORD ST, SOMERVILLE  
 Client ID: IES-6/S-3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	84		%		10/23/19	VT	SW846-%Solid
Soil Extraction SVOA PAH	Completed				10/23/19	RR/E	SW3545A
EPH Extraction	Completed				10/23/19	MB/AK	SW3545A
Ext. Petroleum Hydrocarbons	Completed				10/23/19		MADEP EPH-04
MA Petroleum Hydrocarbon (VPH)	Completed				10/30/19	RM	MADEP VPH04

EPH Other PAH Target Analytes

Acenaphthylene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Anthracene	0.33	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benz(a)anthracene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(a)pyrene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(b)fluoranthene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(ghi)perylene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Benzo(k)fluoranthene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Chrysene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Dibenz(a,h)anthracene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Fluoranthene	0.45	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Fluorene	1.9	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Indeno(1,2,3-cd)pyrene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Pyrene	0.64	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004

QA/QC Surrogates

% 2-Fluorobiphenyl	61		%	1	10/24/19	WB	30 - 130 %
% Nitrobenzene-d5	103		%	1	10/24/19	WB	30 - 130 %
% Terphenyl-d14	90		%	1	10/24/19	WB	30 - 130 %

EPH Diesel PAH Target Analytes

2-Methylnaphthalene	5.6	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Acenaphthene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Naphthalene	ND	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004
Phenanthrene	2.8	0.28	mg/Kg	1	10/24/19	WB	MA EPH 5/2004

**MA EPH Aliphatic/Aromatic Ranges**

C11-C22 Aromatic Hydrocarbons 1,2*	890	79	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
C11-C22 Aromatic Hydrocarbons Unadj	1000	79	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	320	79	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	1200	79	mg/Kg	1	10/25/19	AW	MA EPH 5/2004
Total TPH 1,2*	2400	79	mg/Kg	1	10/25/19	AW	MA EPH 5/2004

**QA/QC Surrogates**

% 1-chlorooctadecane (aliphatic)	71		%	1	10/25/19	AW	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	84		%	1	10/25/19	AW	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	138		%	1	10/25/19	AW	40 - 140 %
% o-terphenyl (aromatic)	82		%	1	10/25/19	AW	40 - 140 %

**MA Volatile Petroleum Hydrocarbons (VPH)**

Unadjusted C5-C8 Aliphatics (*1)	ND	7.5	mg/Kg	50	10/30/19	RM	MA VPH 5/2004
Unadjusted C9-C12 Aliphatics (*1)	100	7.5	mg/Kg	50	10/30/19	RM	MA VPH 5/2004
C5-C8 Aliphatic Hydrocarbons *1,2	ND	7.5	mg/Kg	50	10/30/19	RM	MA VPH 5/2004
C9-C12 Aliphatic Hydrocarbons *1,3	61	7.5	mg/Kg	50	10/30/19	RM	MA VPH 5/2004
C9-C10 Aromatic Hydrocarbons *1	40	7.5	mg/Kg	50	10/30/19	RM	MA VPH 5/2004
Benzene	ND	0.037	mg/Kg	50	10/30/19	RM	MA VPH 5/2004
Ethyl Benzene	0.15	0.075	mg/Kg	50	10/30/19	RM	MA VPH 5/2004
MTBE	ND	0.075	mg/Kg	50	10/30/19	RM	MA VPH 5/2004
Naphthalene	0.42	0.37	mg/Kg	50	10/30/19	RM	MA VPH 5/2004
Toluene	ND	0.075	mg/Kg	50	10/30/19	RM	MA VPH 5/2004
m,p-Xylenes	ND	0.075	mg/Kg	50	10/30/19	RM	MA VPH 5/2004
o-Xylene	0.11	0.075	mg/Kg	50	10/30/19	RM	MA VPH 5/2004

**QA/QC Surrogates**

% 2,5-Dibromotoluene (FID)	108		%	50	10/30/19	RM	70 - 130 %
% 2,5-Dibromotoluene (PID)	108		%	50	10/30/19	RM	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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Massachusetts does not offer certification for Soil/Solid matrices.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

### **Comments:**

MAEPH:

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C22 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

VPH:

\*1 Range data exclude concentrations of any surrogate(s) and/or Internal stds eluting in that range.

\*2 C5-C8 and C9-C12 Aliphatic exclude the conc. of Target Analytes in that range.

\*3 C9-C12 Aliphatic also exclude C9-C10 Aromatic Hydrocarbons.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

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**Phyllis Shiller, Laboratory Director**

**November 01, 2019**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# QA/QC Report

November 01, 2019

## QA/QC Data

SDG I.D.: GCE46525

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 503040 (mg/kg), QC Sample No: CE46740 2X (CE46525, CE46527, CE46528)													
Mercury - Soil	BRL	0.02	0.08	<0.03	NC	93.2	96.4	3.4	68.3	78.8	14.3	75 - 125	20 m
Comment: Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 75-125%													
QA/QC Batch 502978 (mg/kg), QC Sample No: CE46519 (CE46525, CE46527, CE46528)													
<b>ICP Metals - Soil</b>													
Arsenic	BRL	0.67	8.17	7.28	11.5	107	107	0.0	89.7			75 - 125	30
Barium	BRL	0.33	68.2	96.5	34.4	106	108	1.9	105			75 - 125	30 r
Cadmium	BRL	0.33	1.23	0.75	NC	93.7	92.9	0.9	90.1			75 - 125	30
Chromium	BRL	0.33	18.8	18.4	2.20	106	107	0.9	97.4			75 - 125	30
Lead	BRL	0.33	1380	1480	7.00	98.9	103	4.1	>130			75 - 125	30 m
Selenium	BRL	1.3	<1.5	<1.4	NC	89.5	89.4	0.1	76.8			75 - 125	30
Silver	BRL	0.33	<0.37	<0.36	NC	113	114	0.9	103			75 - 125	30

m = This parameter is outside laboratory MS/MSD specified recovery limits.

r = This parameter is outside laboratory RPD specified recovery limits.



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 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# QA/QC Report

November 01, 2019

## QA/QC Data

SDG I.D.: GCE46525

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 502981 (mg/kg), QC Sample No: CE45201 (CE46526, CE46529, CE46530)										
<b>Extractable Petroleum Hydrocarbons - Soil</b>										
C11-C22 Aromatic Hydrocarbons 1	ND	3.3	81	80	1.2	84	81	3.6	40 - 140	25
C11-C22 Aromatic Hydrocarbons U	ND	3.3							40 - 140	25
C19-C36 Aliphatic Hydrocarbons 1*	ND	3.3	90	83	8.1	76	75	1.3	40 - 140	25
C9-C18 Aliphatic Hydrocarbons 1*	ND	3.3	67	63	6.2	61	59	3.3	40 - 140	25
Total TPH 1,2*	ND	3.3	80	74	7.8	70	68	2.9	40 - 140	25
% 1-chlorooctadecane (aliphatic)	87	%	88	84	4.7	75	74	1.3	40 - 140	25
% 2-Bromonaphthalene (Fractionati	86	%	90	95	5.4	97	92	5.3	40 - 140	25
% 2-Fluorobiphenyl (Fractionation)	88	%	91	93	2.2	98	93	5.2	40 - 140	25
% 2-Methylnaphthalene BT		%	4.7	4.9	4.2				0 - 5	
% Naphthalene BT		%	0	0	NC				0 - 5	
% o-terphenyl (aromatic)	72	%	77	77	0.0	75	77	2.6	40 - 140	25

Comment:

Additional EPH fractionation criteria: Breakthrough criteria (BT) is 0 to 5%

QA/QC Batch 502991 (mg/Kg), QC Sample No: CE46485 (CE46525, CE46526, CE46527, CE46528, CE46529, CE46530)

## Polynuclear Aromatic HC - Soil

2-Methylnaphthalene	ND	0.23	58	64	9.8	66	55	18.2	40 - 140	30
Acenaphthene	ND	0.23	72	72	0.0	75	59	23.9	40 - 140	30
Acenaphthylene	ND	0.23	66	68	3.0	72	55	26.8	40 - 140	30
Anthracene	ND	0.23	77	78	1.3	75	63	17.4	40 - 140	30
Benz(a)anthracene	ND	0.23	81	82	1.2	76	64	17.1	40 - 140	30
Benzo(a)pyrene	ND	0.23	78	79	1.3	77	63	20.0	40 - 140	30
Benzo(b)fluoranthene	ND	0.23	80	82	2.5	78	63	21.3	40 - 140	30
Benzo(ghi)perylene	ND	0.23	71	72	1.4	71	58	20.2	40 - 140	30
Benzo(k)fluoranthene	ND	0.23	77	79	2.6	80	64	22.2	40 - 140	30
Chrysene	ND	0.23	78	79	1.3	73	61	17.9	40 - 140	30
Dibenz(a,h)anthracene	ND	0.23	81	82	1.2	79	63	22.5	40 - 140	30
Fluoranthene	ND	0.23	73	76	4.0	76	61	21.9	40 - 140	30
Fluorene	ND	0.23	72	74	2.7	77	59	26.5	40 - 140	30
Indeno(1,2,3-cd)pyrene	ND	0.23	82	82	0.0	80	65	20.7	40 - 140	30
Naphthalene	ND	0.23	53	60	12.4	63	51	21.1	40 - 140	30
Phenanthrene	ND	0.23	75	76	1.3	72	60	18.2	40 - 140	30
Pyrene	ND	0.23	75	79	5.2	77	62	21.6	40 - 140	30
% 2-Fluorobiphenyl	53	%	57	63	10.0	63	51	21.1	30 - 130	30
% Nitrobenzene-d5	53	%	46	58	23.1	63	52	19.1	30 - 130	30
% Terphenyl-d14	52	%	61	68	10.9	68	55	21.1	30 - 130	30

Comment:

Additional 8270 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 10-110%, for soils 30-130%)

**QA/QC Data**

SDG I.D.: GCE46525

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								

QA/QC Batch 503586 (mg/Kg), QC Sample No: CE46529 (CE46526 (50X) , CE46529 (50X) )

**Volatile Petroleum Hydrocarbons - Soil**

Benzene	ND	0.25	92	93	1.1	89	94	5.5	70 - 130	30
C5-C8 Aliphatic Hydrocarbons *1,2	ND	5.0	86	88	2.3	86	87	1.2	70 - 130	30
C9-C10 Aromatic Hydrocarbons *1	ND	1.7	98	101	3.0	96	101	5.1	70 - 130	30
C9-C12 Aliphatic Hydrocarbons *1,	ND	5.0	87	88	1.1	95	93	2.1	70 - 130	30
Ethyl Benzene	ND	0.25	95	97	2.1	93	99	6.3	70 - 130	30
m,p-Xylenes	ND	0.25	96	98	2.1	93	99	6.3	70 - 130	30
MTBE	ND	0.050	97	96	1.0	90	97	7.5	70 - 130	30
Naphthalene	ND	0.25	104	101	2.9	91	98	7.4	70 - 130	30
o-Xylene	ND	0.25	95	97	2.1	92	98	6.3	70 - 130	30
Toluene	ND	0.25	95	96	1.0	91	97	6.4	70 - 130	30
Unadjusted C5-C8 Aliphatics (*1)	ND	5.0	86	88	2.3	86	87	1.2	70 - 130	30
Unadjusted C9-C12 Aliphatics (*1)	ND	5.0	87	88	1.1	95	93	2.1	70 - 130	30
% 2,5-Dibromotoluene (PID)	102	%	109	106	2.8	104	116	10.9	70 - 130	30

QA/QC Batch 504194 (mg/Kg), QC Sample No: CE49005 (CE46530 (50X) )

**Volatile Petroleum Hydrocarbons - Soil**

Benzene	ND	0.25	91	95	4.3	77	117	41.2	70 - 130	30	r
C5-C8 Aliphatic Hydrocarbons *1,2	ND	5.0	95	95	0.0	73	107	37.8	70 - 130	30	r
C9-C10 Aromatic Hydrocarbons *1	ND	1.7	96	99	3.1	81	123	41.2	70 - 130	30	r
C9-C12 Aliphatic Hydrocarbons *1,	ND	5.0	83	80	3.7	76	116	41.7	70 - 130	30	r
Ethyl Benzene	ND	0.25	94	97	3.1	79	120	41.2	70 - 130	30	r
m,p-Xylenes	ND	0.25	95	98	3.1	79	120	41.2	70 - 130	30	r
MTBE	ND	0.050	96	98	2.1	81	123	41.2	70 - 130	30	r
Naphthalene	ND	0.25	98	100	2.0	82	121	38.4	70 - 130	30	r
o-Xylene	ND	0.25	93	96	3.2	78	119	41.6	70 - 130	30	r
Toluene	ND	0.25	94	97	3.1	78	119	41.6	70 - 130	30	r
Unadjusted C5-C8 Aliphatics (*1)	ND	5.0	95	95	0.0	73	107	37.8	70 - 130	30	r
Unadjusted C9-C12 Aliphatics (*1)	ND	5.0	83	80	3.7	76	116	41.7	70 - 130	30	r
% 2,5-Dibromotoluene (PID)	93	%	101	102	1.0	100	105	4.9	70 - 130	30	

Comment:

A blank MS/MSD was analyzed with this batch.

r = This parameter is outside laboratory RPD specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference

LCS - Laboratory Control Sample

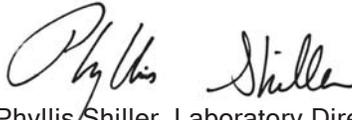
LCSD - Laboratory Control Sample Duplicate

MS - Matrix Spike

MS Dup - Matrix Spike Duplicate

NC - No Criteria

Intf - Interference

  
 Phyllis Shiller, Laboratory Director  
 November 01, 2019

Friday, November 01, 2019

Criteria: MA: CAM, S1

State: MA

## Sample Criteria Exceedances Report GCE46525 - IESINC

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CE46527	\$8100SMR	Dibenz(a,h)anthracene	MA / CMR 310.40.1600 / S1 (mg/kg)	1000	260	700	700	ug/Kg
CE46527	\$8100SMR	Phenanthrene	MA / CMR 310.40.1600 / S1 (mg/kg)	15000	2600	10000	10000	ug/Kg
CE46527	\$8100SMR	Benzo(a)pyrene	MA / CMR 310.40.1600 / S1 (mg/kg)	5500	260	2000	2000	ug/Kg
CE46527	\$8100SMR	Benzo(a)pyrene	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	5500	260	2000	2000	ug/Kg
CE46527	\$8100SMR	Dibenz(a,h)anthracene	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	1000	260	700	700	ug/Kg
CE46527	\$8100SMR	Phenanthrene	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	15000	2600	10000	10000	ug/Kg
CE46527	PB-SM	Lead	MA / CMR 310.40.1600 / S1 (mg/kg)	863	3.5	200	200	mg/Kg
CE46527	PB-SM	Lead	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	863	3.5	200	200	mg/Kg
CE46528	\$8100SMR	Benzo(a)pyrene	MA / CMR 310.40.1600 / S1 (mg/kg)	5700	270	2000	2000	ug/Kg
CE46528	\$8100SMR	Benzo(a)pyrene	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	5700	270	2000	2000	ug/Kg
CE46528	PB-SM	Lead	MA / CMR 310.40.1600 / S1 (mg/kg)	697	0.38	200	200	mg/Kg
CE46528	PB-SM	Lead	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	697	0.38	200	200	mg/Kg
CE46530	\$EPHD_TARG	2-Methylnaphthalene	MA / CMR 310.40.1600 / S1 (mg/kg)	5600	280	700	700	ug/Kg
CE46530	\$EPHD_TARG	2-Methylnaphthalene	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	5600	280	700	700	ug/Kg
CE46530	\$EPHRANGE-S	C9-C18 Aliphatic Hydrocarbons 1*	MA / CMR 310.40.1600 / S1 (mg/kg)	1200	79	1000	1000	mg/Kg
CE46530	\$EPHRANGE-S	C9-C18 Aliphatic Hydrocarbons 1*	MA / SOIL S-1 STANDARDS / S-1 Soil & GW-1	1200	79	1000	1000	mg/Kg

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedance information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

## MassDEP Analytical Protocol Certification Form

**Laboratory Name:** Phoenix Environmental Laboratories, Inc. **Project #:**

**Project Location:** 345 MEDFORD ST, SOMERVILLE **RTN:**

**This Form provides certifications for the following data set: [list Laboratory Sample ID Number(s)]**  
 CE46525, CE46526, CE46527, CE46528, CE46529, CE46530

Matrices:  Groundwater/Surface Water  Soil/Sediment  Drinking Water  Air  Other:

**CAM Protocol (check all that apply below)**

8260 VOC CAM II A <input type="checkbox"/>	7470/7471 Hg CAM III B <input checked="" type="checkbox"/>	MassDEP VPH CAM IV A <input checked="" type="checkbox"/>	8081 Pesticides CAM V B <input type="checkbox"/>	7196 Hex Cr CAM VI B <input type="checkbox"/>	MassDEP APH CAM IX A <input type="checkbox"/>
8270 SVOC CAM II B <input checked="" type="checkbox"/>	7010 Metals CAM III C <input type="checkbox"/>	MassDEP EPH CAM IV B <input checked="" type="checkbox"/>	8151 Herbicides CAM V C <input type="checkbox"/>	8330 Explosives CAM VIII A <input type="checkbox"/>	TO-15 VOC CAM IX B <input type="checkbox"/>
6010 Metals CAM III A <input checked="" type="checkbox"/>	6020 Metals CAM III D <input type="checkbox"/>	8082 PCB CAM V A <input type="checkbox"/>	9012 Total Cyanide/PAC CAM V1 A <input type="checkbox"/>	6860 Perchlorate CAM VIII B <input type="checkbox"/>	

**Affirmative responses to questions A through F are required for "Presumptive Certainty" status**

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature*) in the field or laboratory, and prepared/analyzed with method holding times? (* see narrative)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
E	a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 methods only: Was the complete analyte list reported for each method?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**Responses to questions G, H and I below is required for "Presumptive Certainty" status**

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056(2)(k) and WSC-07-350</b>		
H	Were all QC performance standards specified in the CAM protocol(s) achieved? See Section: ICP Narration .	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

*All negative responses must be addressed in an attached laboratory narrative.*

**I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.**

Date: Friday, November 01, 2019

Authorized Signature: Rashmi Makol Printed Name: Rashmi Makol  
 Position: Project Manager



**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



## MCP Certification Report

November 01, 2019

SDG I.D.: GCE46525

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### SDG Comments

#### Metals Analysis:

The client requested a shorter list of elements than the 6010 MCP list. Only the RCRA 8 Metals are reported as requested on the chain of custody.

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### EPH Narration

Were all QA/QC performance criteria specified in the MADEP document CAM achieved? Yes.

#### Instrument:

**AU-FID3 10/25/19-1** Adam Werner, Chemist 10/25/19  
CE46530

No significant modifications were made to the EPH method, as specified in Section 11.3 of the method.

The initial calibration (AR0913BI) RSD for the compound list was less than 20% except for the following compounds: None. The continuing calibration %D for the compound list was less than 25% except for the following compounds:None.

**AU-FID4 10/24/19-1** Adam Werner, Chemist 10/24/19  
CE46526, CE46529

The initial calibration (ALO23BI) RSD for the compound list was less than 20% except for the following compounds: None. The continuing calibration %D for the compound list was less than 25% except for the following compounds:None.

**AU-FID4 10/25/19-1** Adam Werner, Chemist 10/25/19  
CE46530

The initial calibration (ALO23BI) RSD for the compound list was less than 20% except for the following compounds: None. The continuing calibration %D for the compound list was less than 25% except for the following compounds:None.

#### QC (Batch Specific):

**Batch 502981 (CE45201)**  
CE46526, CE46529, CE46530

All LCS recoveries were within 40 - 140 with the following exceptions: None.  
All LCSD recoveries were within 40 - 140 with the following exceptions: None.  
All LCS/LCSD RPDs were less than 25% with the following exceptions: None.  
Additional EPH fractionation criteria: Breakthrough criteria (BT) is 0 to 5%

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

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### Mercury Narration

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

#### Instrument:

**MERLIN 10/24/19 07:37** Rick Schweitzer, Chemist 10/24/19  
CE46525, CE46527, CE46528

The method preparation blank contains all of the acids and reagents as the samples; the instrument blanks do not. The initial calibration met all criteria including a standard run at or below the reporting level. All calibration verification standards (ICV, CCV) met criteria.



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## Certification Report

November 01, 2019

SDG I.D.: GCE46525

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### Mercury Narration

All calibration blank verification standards (ICB, CCB) met criteria.

The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.

The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.

The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

#### QC (Batch Specific):

##### **Batch 503040 (CE46740)**

CE46525, CE46527, CE46528

All LCS recoveries were within 75 - 125 with the following exceptions: None.

All LCSD recoveries were within 75 - 125 with the following exceptions: None.

All LCS/LCSD RPDs were less than 20% with the following exceptions: None.

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 75-125%

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### ICP Metals Narration

Were all QA/QC performance criteria specified in the analytical method achieved? No.

**QC Batch 502978 (Samples: CE46525, CE46527, CE46528): -----**

**The Sample/Duplicate RPD exceeds the method criteria for one or more analytes, therefore there may be variability in the reported result. (Barium)**

#### Instrument:

##### **ARCOS 10/24/19 08:18**

Emily Kolominskaya, Chemist 10/24/19

CE46525, CE46527, CE46528

Additional criteria for CCV and ICSAB:

Sodium and Potassium are poor performing elements, the laboratory's in-house limits are 85-115% (CCV) and 70-130% (ICSAB). The linear range is defined daily by the calibration range.

The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.

The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

The following ICP Interference Check (ICSAB) compounds did not meet criteria: None.

#### QC (Batch Specific):

##### **Batch 502978 (CE46519)**

CE46525, CE46527, CE46528

All LCS recoveries were within 75 - 125 with the following exceptions: None.

All LCSD recoveries were within 75 - 125 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

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### SVOA Narration

Were all QA/QC performance criteria specified in the MADEP document CAM achieved? Yes.

#### Instrument:

##### **CHEM04 10/24/19-1**

Wes Bryon, Chemist 10/24/19



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## MCP Certification Report

November 01, 2019

SDG I.D.: GCE46525

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### **SVOA Narration**

CE46525, CE46526, CE46527, CE46528, CE46529, CE46530

For 8270 full list, the DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.

For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

Initial Calibration Evaluation (CHEM04/4\_BN\_1015):

100% of target compounds met criteria.

The following compounds had %RSDs >20%: None.

The following compounds did not meet recommended response factors: None.

The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM04/1024\_03-4\_BN\_1015) (MCP Compliance):

Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.

95% of target compounds met criteria.

The following compounds did not meet % deviation criteria: None.

The following compounds did not meet maximum % deviations: None.

The following compounds did not meet recommended response factors: None.

The following compounds did not meet minimum response factors: None.

#### **CHEM07 10/25/19-1**

Wes Bryon, Chemist 10/25/19

CE46527, CE46528

For 8270 full list, the DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.

For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

Initial Calibration Evaluation (CHEM07/7\_BN\_0927A):

100% of target compounds met criteria.

The following compounds had %RSDs >20%: None.

The following compounds did not meet recommended response factors: None.

The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM07/1025\_03A-7\_BN\_0927A) (MCP Compliance):

Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.

100% of target compounds met criteria.

The following compounds did not meet % deviation criteria: None.

The following compounds did not meet maximum % deviations: None.

The following compounds did not meet recommended response factors: None.

The following compounds did not meet minimum response factors: None.

### **QC (Batch Specific):**

#### **Batch 502991 (CE46485)**

CE46525, CE46526, CE46527, CE46528, CE46529, CE46530

All LCS recoveries were within 40 - 140 with the following exceptions: None.

All LCSD recoveries were within 40 - 140 with the following exceptions: None.

All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

Additional 8270 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 10-110%, for soils 30-130%)



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## MCP Certification Report

November 01, 2019

SDG I.D.: GCE46525

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### **SVOA Narration**

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

### **VPH Narration**

Were all QA/QC performance criteria specified in the MADEP document CAM achieved? Yes.

#### **Instrument:**

**PIDFID 10/25/19-2** Raman Makol, Chemist 10/25/19  
CE46526, CE46529

**PIDFID 10/29/19-2** Raman Makol, Chemist 10/29/19  
CE46530

#### **QC (Batch Specific):**

##### **Batch 503586 (CE46529)**

CE46526, CE46529

All LCS recoveries were within 70 - 130 with the following exceptions: None.  
All LCSD recoveries were within 70 - 130 with the following exceptions: None.  
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.

##### **Batch 504194 (CE49005)**

CE46530

All LCS recoveries were within 70 - 130 with the following exceptions: None.  
All LCSD recoveries were within 70 - 130 with the following exceptions: None.  
All LCS/LCSD RPDs were less than 30% with the following exceptions: None.  
A blank MS/MSD was analyzed with this batch.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



### EPH Fractionation Standard

SDG I.D.: GCE46525

Effective Date(s): 01/01/19 - 01/01/20

Analyst: aw

AS #	TV	20ml	22ml	25ml	30ml	% Rec1	% Rec2	% Rec3	% Rec4	Rec Limits
Napthalene	40	29.07	25.21	26.79	27.50	72.7	63.0	67.0	68.8	40-140
2-Methylnaphthalene	40	29.38	25.00	26.56	26.37	73.4	62.5	66.4	65.9	40-140
Acenaphthalene	40	27.84	26.03	27.27	27.96	69.6	65.1	68.2	69.9	40-140
Acenaphthene	40	28.33	26.52	27.80	28.46	70.8	66.3	69.5	71.2	40-140
C9 - Nonane	40	14.24	14.96	14.72	16.54	35.6	37.4	36.8	41.4	40-140
C-10 Decane	40	19.60	20.53	19.99	19.59	49.0	51.3	50.0	49.0	40-140
Fluorene	40	30.43	26.85	28.06	28.49	76.1	67.1	70.1	71.2	40-140
C12 - Dodecane	40	23.94	24.94	24.29	23.93	59.8	62.3	60.7	59.8	40-140
Phenanthrene	40	28.88	26.42	28.17	28.74	72.2	66.1	70.4	71.9	40-140
Anthracene	40	30.28	27.00	28.64	28.70	75.7	67.5	71.6	71.8	40-140
C14 - Tetradecane	40	25.84	27.22	26.41	26.16	64.6	68.1	66.0	65.4	40-140
C16 - Hexadecane	40	27.33	28.78	28.18	29.40	68.3	71.9	70.4	73.5	40-140
Fluoranthene	40	26.66	23.93	25.51	25.75	66.6	59.8	63.8	64.4	40-140
C18 - Octadecane	40	28.14	29.82	29.74	30.29	70.4	74.5	74.4	75.7	40-140
Pyrene	40	28.23	23.73	25.55	25.56	70.6	59.3	63.9	63.9	40-140
Benzo(a)anthracene	40	27.98	23.04	25.56	26.23	69.9	57.6	63.9	65.6	40-140
Chrysene	40	30.41	21.98	28.13	26.63	76.0	54.9	70.3	66.6	40-140
Benzo(b/k)fluoranthene (c)	80	55.04	49.58	52.79	52.21	68.8	62.0	66.0	65.3	40-140
Benzo(a)pyrene	40	30.15	26.66	24.88	24.10	75.4	66.6	62.2	60.3	40-140
Indeno/Dibenz(copk)	80	50.82	51.28	46.48	50.01	63.5	64.1	58.1	62.5	40-140
Benzo(ghi)perylene	40	30.57	30.80	26.05	26.44	76.4	77.0	65.1	66.1	40-140
C19 - Nonadecane	40	28.94	30.51	30.55	31.40	72.4	76.3	76.4	78.5	40-140
C20 - Eicosane	40	28.67	29.78	30.17	31.33	71.7	74.4	75.4	78.3	40-140
C22 - Docosane	40	28.10	28.68	28.73	30.25	70.3	71.7	71.8	75.6	40-140
C24 - Tetracosane	40	28.36	29.39	29.13	30.44	70.9	73.5	72.8	76.1	40-140
C26 - Hexacosane	40	28.40	30.03	29.45	30.55	71.0	75.1	73.6	76.4	40-140
C28 - Octacosane	40	30.66	32.31	31.96	33.00	76.6	80.8	79.9	82.5	40-140
C30 - Tricotane	40	28.64	29.93	29.68	30.69	71.6	74.8	74.2	76.7	40-140
C36 - Hexatriacontane	40	31.38	33.40	32.73	33.70	78.4	83.5	81.8	84.2	40-140

Notes: EPH Frac Check Solution EPH10b-solvent transfer into hex, frac 1ml. Dilute 5x to run tv=40 Lot:140118-1165992  
 AU-FID3 10/29/18 EPH O29\_062/O29\_064/O29\_066/O29\_068





Monday, November 11, 2019

Attn: Mr. Steve Iorio  
IES, Inc.  
50 Salem Street, Building A-Suite 108  
Lynnfield, MA 01940

Project ID: 345 MEDFORD ST SOMERVILLE  
SDG ID: GCE55698  
Sample ID#s: CE55698 - CE55705

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style.

Phyllis Shiller

Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #M-CT007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
UT Lab Registration #CT00007  
VT Lab Registration #VT11301



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



## SDG Comments

November 11, 2019

SDG I.D.: GCE55698

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Phoenix reporting levels may exceed those referenced in the CAM protocol. Please refer to criteria sheet for comparisons to requested MCP standards.



Environmental Laboratories, Inc.  
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Tel. (860) 645-1102 Fax (860) 645-0823

## Sample Id Cross Reference

November 11, 2019

SDG I.D.: GCE55698

Project ID: 345 MEDFORD ST SOMERVILLE

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Client Id	Lab Id	Matrix
IES-1	CE55698	GROUND WATER
IES-2	CE55699	GROUND WATER
IES-6	CE55700	GROUND WATER
OW-2	CE55701	GROUND WATER
MW-6	CE55702	GROUND WATER
MW-3	CE55703	GROUND WATER
MW-4	CE55704	GROUND WATER
MW-5A	CE55705	GROUND WATER



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 11, 2019

FOR: Attn: Mr. Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: GROUND WATER  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by: JB  
 Received by: B  
 Analyzed by: see "By" below

Date                      Time  
 10/30/19                      12:50  
 11/06/19                      17:19

Laboratory Data

SDG ID: GCE55698  
 Phoenix ID: CE55698

Project ID: 345 MEDFORD ST SOMERVILLE  
 Client ID: IES-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
EPH Extraction	Completed				11/07/19	JS/JS	SW3510C
MA Petroleum Hydrocarbon (EPH)	Completed				11/06/19		MADEP EPH-04
Semi-Volatile Extraction	Completed				11/06/19	P/AK	SW3520C
MA Petroleum Hydrocarbon (VPH)	Completed				11/06/19	RM	MADEP VPH04

**Semivolatiles by SIM, PAH**

2-Methylnaphthalene	0.00061	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthene	0.0013	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthylene	0.00012	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Anthracene	0.00049	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benz(a)anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(a)pyrene	ND	0.00019	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(b)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(ghi)perylene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(k)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Chrysene	0.00006	0.00005	mg/L	1	11/07/19	WB	SW8270D (SIM)
Dibenz(a,h)anthracene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluoranthene	0.00079	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluorene	0.0017	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Naphthalene	0.00076	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Phenanthrene	0.0032	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Pyrene	0.00058	0.00007	mg/L	1	11/07/19	WB	SW8270D (SIM)

**QA/QC Surrogates**

% 2-Fluorobiphenyl	56		%	1	11/07/19	WB	40 - 140 %
% Nitrobenzene-d5	48		%	1	11/07/19	WB	40 - 140 %
% Terphenyl-d14	62		%	1	11/07/19	WB	40 - 140 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
<b>MA EPH Aliphatic/Aromatic Ranges</b>							
C11-C22 Aromatic Hydrocarbons 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C11-C22 Aromatic Hydrocarbons Unadj	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
Total TPH 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
<b>QA/QC Surrogates</b>							
% 1-chlorooctadecane (aliphatic)	60		%	1	11/07/19	AW	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	67		%	1	11/07/19	AW	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	73		%	1	11/07/19	AW	40 - 140 %
% o-terphenyl (aromatic)	63		%	1	11/07/19	AW	40 - 140 %
<b>MA Volatile Petroleum Hydrocarbons (VPH)</b>							
Unadjusted C5-C8 Aliphatics (*1)	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
Unadjusted C9-C12 Aliphatics (*1)	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C5-C8 Aliphatic Hydrocarbons *1,2	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C9-C12 Aliphatic Hydrocarbons *1,3	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C9-C10 Aromatic Hydrocarbons *1	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
Benzene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
Ethyl Benzene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
MTBE	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
Naphthalene	ND	0.005	mg/L	1	11/06/19	RM	MA VPH 5/2004
Toluene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
m,p-Xylenes	ND	0.002	mg/L	1	11/06/19	RM	MA VPH 5/2004
o-Xylene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
<b>QA/QC Surrogates</b>							
% 2,5-Dibromotoluene (FID)	72		%	1	11/06/19	RM	70 - 130 %
% 2,5-Dibromotoluene (PID)	76		%	1	11/06/19	RM	70 - 130 %

Client ID: IES-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:****MAEPH:**

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

**VPH:**

\*1 Range data exclude conc.s of any surrogate(s) and/or Int. std.s eluting in that range.

\*2 C5-C8 and C9-C12 Aliphatic exclude the conc. of Target Analytes in that range.

\*3 C9-C12 Aliphatic also exclude C9-C10 Aromatic Hydrocarbon

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.

The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

**Phyllis Shiller, Laboratory Director****November 11, 2019****Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 11, 2019

FOR: Attn: Mr. Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: GROUND WATER  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by: JB  
 Received by: B  
 Analyzed by: see "By" below

Date                      Time  
 10/30/19                      12:04  
 11/06/19                      17:19

Laboratory Data

SDG ID: GCE55698  
 Phoenix ID: CE55699

Project ID: 345 MEDFORD ST SOMERVILLE  
 Client ID: IES-2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
EPH Extraction	Completed				11/07/19	JS/JS	SW3510C
MA Petroleum Hydrocarbon (EPH)	Completed				11/06/19		MADEP EPH-04
Semi-Volatile Extraction	Completed				11/06/19	P/AK	SW3520C
MA Petroleum Hydrocarbon (VPH)	Completed				11/06/19	RM	MADEP VPH04

**Semivolatiles by SIM, PAH**

2-Methylnaphthalene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthylene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benz(a)anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(a)pyrene	ND	0.00019	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(b)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(ghi)perylene	0.00002	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(k)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Chrysene	ND	0.00005	mg/L	1	11/07/19	WB	SW8270D (SIM)
Dibenz(a,h)anthracene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluoranthene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluorene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Naphthalene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Phenanthrene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Pyrene	ND	0.00007	mg/L	1	11/07/19	WB	SW8270D (SIM)

**QA/QC Surrogates**

% 2-Fluorobiphenyl	44		%	1	11/07/19	WB	40 - 140 %
% Nitrobenzene-d5	27		%	1	11/07/19	WB	40 - 140 %
% Terphenyl-d14	64		%	1	11/07/19	WB	40 - 140 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
<b>MA EPH Aliphatic/Aromatic Ranges</b>							
C11-C22 Aromatic Hydrocarbons 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C11-C22 Aromatic Hydrocarbons Unadj	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
Total TPH 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
<b>QA/QC Surrogates</b>							
% 1-chlorooctadecane (aliphatic)	56		%	1	11/07/19	AW	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	60		%	1	11/07/19	AW	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	71		%	1	11/07/19	AW	40 - 140 %
% o-terphenyl (aromatic)	60		%	1	11/07/19	AW	40 - 140 %
<b>MA Volatile Petroleum Hydrocarbons (VPH)</b>							
Unadjusted C5-C8 Aliphatics (*1)	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
Unadjusted C9-C12 Aliphatics (*1)	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C5-C8 Aliphatic Hydrocarbons *1,2	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C9-C12 Aliphatic Hydrocarbons *1,3	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C9-C10 Aromatic Hydrocarbons *1	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
Benzene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
Ethyl Benzene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
MTBE	0.079	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
Naphthalene	ND	0.005	mg/L	1	11/06/19	RM	MA VPH 5/2004
Toluene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
m,p-Xylenes	ND	0.002	mg/L	1	11/06/19	RM	MA VPH 5/2004
o-Xylene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
<b>QA/QC Surrogates</b>							
% 2,5-Dibromotoluene (FID)	82		%	1	11/06/19	RM	70 - 130 %
% 2,5-Dibromotoluene (PID)	87		%	1	11/06/19	RM	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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3 = This parameter exceeds laboratory specified limits.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

MAEPH:

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

VPH:

\*1 Range data exclude conc.s of any surrogate(s) and/or Int. std.s eluting in that range.

\*2 C5-C8 and C9-C12 Aliphatic exclude the conc. of Target Analytes in that range.

\*3 C9-C12 Aliphatic also exclude C9-C10 Aromatic Hydrocarbon

Semi-Volatile Comment:

Poor surrogate recovery was observed for one acid and/or one base surrogate. The other surrogates associated with this sample were within QA/QC criteria. No significant bias suspected.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



**Phyllis Shiller, Laboratory Director**

**November 11, 2019**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 11, 2019

FOR: Attn: Mr. Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: GROUND WATER  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by: JB  
 Received by: B  
 Analyzed by: see "By" below

Date

10/30/19  
 11/06/19

Time

10:52  
 17:19

Laboratory Data

SDG ID: GCE55698  
 Phoenix ID: CE55700

Project ID: 345 MEDFORD ST SOMERVILLE  
 Client ID: IES-6

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
EPH Extraction	Completed				11/07/19	JS/JS	SW3510C
MA Petroleum Hydrocarbon (EPH)	Completed				11/06/19		MADEP EPH-04
Semi-Volatile Extraction	Completed				11/06/19	P/AK	SW3520C
MA Petroleum Hydrocarbon (VPH)	Completed				11/07/19	RM	MADEP VPH04

**Semivolatiles by SIM, PAH**

2-Methylnaphthalene	0.0039	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthene	0.00048	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthylene	0.0001	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benz(a)anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(a)pyrene	ND	0.00019	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(b)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(ghi)perylene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(k)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Chrysene	ND	0.00005	mg/L	1	11/07/19	WB	SW8270D (SIM)
Dibenz(a,h)anthracene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluoranthene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluorene	0.0012	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Naphthalene	0.00066	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Phenanthrene	0.00092	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Pyrene	ND	0.00007	mg/L	1	11/07/19	WB	SW8270D (SIM)

**QA/QC Surrogates**

% 2-Fluorobiphenyl	40		%	1	11/07/19	WB	40 - 140 %
% Nitrobenzene-d5	30		%	1	11/07/19	WB	40 - 140 %
% Terphenyl-d14	50		%	1	11/07/19	WB	40 - 140 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
<b>MA EPH Aliphatic/Aromatic Ranges</b>							
C11-C22 Aromatic Hydrocarbons 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C11-C22 Aromatic Hydrocarbons Unadj	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
Total TPH 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
<b>QA/QC Surrogates</b>							
% 1-chlorooctadecane (aliphatic)	57		%	1	11/07/19	AW	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	72		%	1	11/07/19	AW	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	85		%	1	11/07/19	AW	40 - 140 %
% o-terphenyl (aromatic)	58		%	1	11/07/19	AW	40 - 140 %
<b>MA Volatile Petroleum Hydrocarbons (VPH)</b>							
Unadjusted C5-C8 Aliphatics (*1)	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
Unadjusted C9-C12 Aliphatics (*1)	0.26	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C5-C8 Aliphatic Hydrocarbons *1,2	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C9-C12 Aliphatic Hydrocarbons *1,3	0.14	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C9-C10 Aromatic Hydrocarbons *1	0.12	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
Benzene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
Ethyl Benzene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
MTBE	0.0034	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
Naphthalene	ND	0.005	mg/L	1	11/07/19	RM	MA VPH 5/2004
Toluene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
m,p-Xylenes	ND	0.002	mg/L	1	11/07/19	RM	MA VPH 5/2004
o-Xylene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
<b>QA/QC Surrogates</b>							
% 2,5-Dibromotoluene (FID)	93		%	1	11/07/19	RM	70 - 130 %
% 2,5-Dibromotoluene (PID)	81		%	1	11/07/19	RM	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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3 = This parameter exceeds laboratory specified limits.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

MAEPH:

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

VPH:

\*1 Range data exclude conc.s of any surrogate(s) and/or Int. std.s eluting in that range.

\*2 C5-C8 and C9-C12 Aliphatic exclude the conc. of Target Analytes in that range.

\*3 C9-C12 Aliphatic also exclude C9-C10 Aromatic Hydrocarbon

Semi-Volatile Comment:

Poor surrogate recovery was observed for one acid and/or one base surrogate. The other surrogates associated with this sample were within QA/QC criteria. No significant bias suspected.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



**Phyllis Shiller, Laboratory Director**

**November 11, 2019**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 11, 2019

FOR: Attn: Mr. Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: GROUND WATER  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by: JB  
 Received by: B  
 Analyzed by: see "By" below

Date

10/30/19  
 11/06/19

Time

10:05  
 17:19

Laboratory Data

SDG ID: GCE55698  
 Phoenix ID: CE55701

Project ID: 345 MEDFORD ST SOMERVILLE  
 Client ID: OW-2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
EPH Extraction	Completed				11/07/19	JS/JS	SW3510C
MA Petroleum Hydrocarbon (EPH)	Completed				11/06/19		MADEP EPH-04
Semi-Volatile Extraction	Completed				11/06/19	P/AK	SW3520C
MA Petroleum Hydrocarbon (VPH)	Completed				11/06/19	RM	MADEP VPH04

**Semivolatiles by SIM, PAH**

2-Methylnaphthalene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthylene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benz(a)anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(a)pyrene	ND	0.00019	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(b)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(ghi)perylene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(k)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Chrysene	ND	0.00005	mg/L	1	11/07/19	WB	SW8270D (SIM)
Dibenz(a,h)anthracene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluoranthene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluorene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Naphthalene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Phenanthrene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Pyrene	ND	0.00007	mg/L	1	11/07/19	WB	SW8270D (SIM)

**QA/QC Surrogates**

% 2-Fluorobiphenyl	59		%	1	11/07/19	WB	40 - 140 %
% Nitrobenzene-d5	55		%	1	11/07/19	WB	40 - 140 %
% Terphenyl-d14	60		%	1	11/07/19	WB	40 - 140 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
<b>MA EPH Aliphatic/Aromatic Ranges</b>							
C11-C22 Aromatic Hydrocarbons 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C11-C22 Aromatic Hydrocarbons Unadj	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
Total TPH 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
<b>QA/QC Surrogates</b>							
% 1-chlorooctadecane (aliphatic)	59		%	1	11/07/19	AW	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	55		%	1	11/07/19	AW	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	64		%	1	11/07/19	AW	40 - 140 %
% o-terphenyl (aromatic)	55		%	1	11/07/19	AW	40 - 140 %
<b>MA Volatile Petroleum Hydrocarbons (VPH)</b>							
Unadjusted C5-C8 Aliphatics (*1)	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
Unadjusted C9-C12 Aliphatics (*1)	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C5-C8 Aliphatic Hydrocarbons *1,2	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C9-C12 Aliphatic Hydrocarbons *1,3	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C9-C10 Aromatic Hydrocarbons *1	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
Benzene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
Ethyl Benzene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
MTBE	0.019	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
Naphthalene	ND	0.005	mg/L	1	11/06/19	RM	MA VPH 5/2004
Toluene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
m,p-Xylenes	ND	0.002	mg/L	1	11/06/19	RM	MA VPH 5/2004
o-Xylene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
<b>QA/QC Surrogates</b>							
% 2,5-Dibromotoluene (FID)	84		%	1	11/06/19	RM	70 - 130 %
% 2,5-Dibromotoluene (PID)	86		%	1	11/06/19	RM	70 - 130 %

Client ID: OW-2

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:****MAEPH:**

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

**VPH:**

\*1 Range data exclude conc.s of any surrogate(s) and/or Int. std.s eluting in that range.

\*2 C5-C8 and C9-C12 Aliphatic exclude the conc. of Target Analytes in that range.

\*3 C9-C12 Aliphatic also exclude C9-C10 Aromatic Hydrocarbon

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.

The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

**Phyllis Shiller, Laboratory Director****November 11, 2019****Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 11, 2019

FOR: Attn: Mr. Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: GROUND WATER  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by: JB  
 Received by: B  
 Analyzed by: see "By" below

Date

10/30/19  
 11/06/19

Time

13:50  
 17:19

Laboratory Data

SDG ID: GCE55698  
 Phoenix ID: CE55702

Project ID: 345 MEDFORD ST SOMERVILLE  
 Client ID: MW-6

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
EPH Extraction	Completed				11/07/19	JS/JS	SW3510C
MA Petroleum Hydrocarbon (EPH)	Completed				11/06/19		MADEP EPH-04
Semi-Volatile Extraction	Completed				11/06/19	P/AK	SW3520C
MA Petroleum Hydrocarbon (VPH)	Completed				11/06/19	RM	MADEP VPH04

**Semivolatiles by SIM, PAH**

2-Methylnaphthalene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthylene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benz(a)anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(a)pyrene	ND	0.00019	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(b)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(ghi)perylene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(k)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Chrysene	ND	0.00005	mg/L	1	11/07/19	WB	SW8270D (SIM)
Dibenz(a,h)anthracene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluoranthene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluorene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Naphthalene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Phenanthrene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Pyrene	ND	0.00007	mg/L	1	11/07/19	WB	SW8270D (SIM)

**QA/QC Surrogates**

% 2-Fluorobiphenyl	51	%	1	11/07/19	WB	40 - 140 %
% Nitrobenzene-d5	35	%	1	11/07/19	WB	40 - 140 %
% Terphenyl-d14	62	%	1	11/07/19	WB	40 - 140 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
<b><u>MA EPH Aliphatic/Aromatic Ranges</u></b>							
C11-C22 Aromatic Hydrocarbons 1,2*	ND	0.2	mg/L	1	11/07/19	AW	MAEPH 5/2004
C11-C22 Aromatic Hydrocarbons Unadj	ND	0.2	mg/L	1	11/07/19	AW	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	ND	0.2	mg/L	1	11/07/19	AW	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	ND	0.2	mg/L	1	11/07/19	AW	MAEPH 5/2004
Total TPH 1,2*	ND	0.2	mg/L	1	11/07/19	AW	MAEPH 5/2004
<b><u>QA/QC Surrogates</u></b>							
% 1-chlorooctadecane (aliphatic)	55		%	1	11/07/19	AW	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	48		%	1	11/07/19	AW	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	61		%	1	11/07/19	AW	40 - 140 %
% o-terphenyl (aromatic)	52		%	1	11/07/19	AW	40 - 140 %
<b><u>MA Volatile Petroleum Hydrocarbons (VPH)</u></b>							
Unadjusted C5-C8 Aliphatics (*1)	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
Unadjusted C9-C12 Aliphatics (*1)	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C5-C8 Aliphatic Hydrocarbons *1,2	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C9-C12 Aliphatic Hydrocarbons *1,3	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
C9-C10 Aromatic Hydrocarbons *1	ND	0.1	mg/L	1	11/06/19	RM	MA VPH 5/2004
Benzene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
Ethyl Benzene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
MTBE	0.0097	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
Naphthalene	ND	0.005	mg/L	1	11/06/19	RM	MA VPH 5/2004
Toluene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
m,p-Xylenes	ND	0.002	mg/L	1	11/06/19	RM	MA VPH 5/2004
o-Xylene	ND	0.001	mg/L	1	11/06/19	RM	MA VPH 5/2004
<b><u>QA/QC Surrogates</u></b>							
% 2,5-Dibromotoluene (FID)	82		%	1	11/06/19	RM	70 - 130 %
% 2,5-Dibromotoluene (PID)	83		%	1	11/06/19	RM	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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3 = This parameter exceeds laboratory specified limits.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

MAEPH:

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

VPH:

\*1 Range data exclude conc.s of any surrogate(s) and/or Int. std.s eluting in that range.

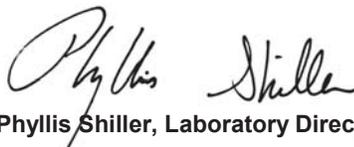
\*2 C5-C8 and C9-C12 Aliphatic exclude the conc. of Target Analytes in that range.

\*3 C9-C12 Aliphatic also exclude C9-C10 Aromatic Hydrocarbon

Semi-Volatile Comment:

Poor surrogate recovery was observed for one acid and/or one base surrogate. The other surrogates associated with this sample were within QA/QC criteria. No significant bias suspected.

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**Phyllis Shiller, Laboratory Director**

**November 11, 2019**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 11, 2019

FOR: Attn: Mr. Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: GROUND WATER  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by: JB  
 Received by: B  
 Analyzed by: see "By" below

Date

10/30/19  
 11/06/19

Time

13:22  
 17:19

Laboratory Data

SDG ID: GCE55698  
 Phoenix ID: CE55703

Project ID: 345 MEDFORD ST SOMERVILLE  
 Client ID: MW-3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
EPH Extraction	Completed				11/07/19	JS/JS	SW3510C
MA Petroleum Hydrocarbon (EPH)	Completed				11/06/19		MADEP EPH-04
Semi-Volatile Extraction	Completed				11/06/19	P/AK	SW3520C
MA Petroleum Hydrocarbon (VPH)	Completed				11/07/19	RM	MADEP VPH04

Semivolatiles by SIM, PAH

2-Methylnaphthalene	ND	0.00048	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthene	ND	0.00048	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthylene	ND	0.0001	mg/L	1	11/07/19	WB	SW8270D (SIM)
Anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benz(a)anthracene	ND	0.0001	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(a)pyrene	ND	0.00019	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(b)fluoranthene	ND	0.0001	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(ghi)perylene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(k)fluoranthene	ND	0.0001	mg/L	1	11/07/19	WB	SW8270D (SIM)
Chrysene	ND	0.00005	mg/L	1	11/07/19	WB	SW8270D (SIM)
Dibenz(a,h)anthracene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluoranthene	ND	0.00048	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluorene	ND	0.0001	mg/L	1	11/07/19	WB	SW8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	0.0001	mg/L	1	11/07/19	WB	SW8270D (SIM)
Naphthalene	ND	0.00048	mg/L	1	11/07/19	WB	SW8270D (SIM)
Phenanthrene	ND	0.00048	mg/L	1	11/07/19	WB	SW8270D (SIM)
Pyrene	ND	0.00007	mg/L	1	11/07/19	WB	SW8270D (SIM)

QA/QC Surrogates

% 2-Fluorobiphenyl	53		%	1	11/07/19	WB	40 - 140 %
% Nitrobenzene-d5	37		%	1	11/07/19	WB	40 - 140 %
% Terphenyl-d14	59		%	1	11/07/19	WB	40 - 140 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
<b><u>MA EPH Aliphatic/Aromatic Ranges</u></b>							
C11-C22 Aromatic Hydrocarbons 1,2*	ND	0.2	mg/L	1	11/07/19	AW	MAEPH 5/2004
C11-C22 Aromatic Hydrocarbons Unadj	ND	0.2	mg/L	1	11/07/19	AW	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	ND	0.2	mg/L	1	11/07/19	AW	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	ND	0.2	mg/L	1	11/07/19	AW	MAEPH 5/2004
Total TPH 1,2*	ND	0.2	mg/L	1	11/07/19	AW	MAEPH 5/2004
<b><u>QA/QC Surrogates</u></b>							
% 1-chlorooctadecane (aliphatic)	41		%	1	11/07/19	AW	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	57		%	1	11/07/19	AW	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	67		%	1	11/07/19	AW	40 - 140 %
% o-terphenyl (aromatic)	44		%	1	11/07/19	AW	40 - 140 %
<b><u>MA Volatile Petroleum Hydrocarbons (VPH)</u></b>							
Unadjusted C5-C8 Aliphatics (*1)	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
Unadjusted C9-C12 Aliphatics (*1)	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C5-C8 Aliphatic Hydrocarbons *1,2	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C9-C12 Aliphatic Hydrocarbons *1,3	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C9-C10 Aromatic Hydrocarbons *1	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
Benzene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
Ethyl Benzene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
MTBE	0.12	0.005	mg/L	5	11/07/19	RM	MA VPH 5/2004
Naphthalene	ND	0.005	mg/L	1	11/07/19	RM	MA VPH 5/2004
Toluene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
m,p-Xylenes	ND	0.002	mg/L	1	11/07/19	RM	MA VPH 5/2004
o-Xylene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
<b><u>QA/QC Surrogates</u></b>							
% 2,5-Dibromotoluene (FID)	83		%	1	11/07/19	RM	70 - 130 %
% 2,5-Dibromotoluene (PID)	82		%	1	11/07/19	RM	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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3 = This parameter exceeds laboratory specified limits.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

MAEPH:

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

VPH:

\*1 Range data exclude conc.s of any surrogate(s) and/or Int. std.s eluting in that range.

\*2 C5-C8 and C9-C12 Aliphatic exclude the conc. of Target Analytes in that range.

\*3 C9-C12 Aliphatic also exclude C9-C10 Aromatic Hydrocarbon

Semi-Volatile Comment:

Poor surrogate recovery was observed for one acid and/or one base surrogate. The other surrogates associated with this sample were within QA/QC criteria. No significant bias suspected.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



**Phyllis Shiller, Laboratory Director**

**November 11, 2019**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 11, 2019

FOR: Attn: Mr. Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: GROUND WATER  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by: JB  
 Received by: B  
 Analyzed by: see "By" below

Date

10/30/19  
 11/06/19

Time

9:45  
 17:19

Laboratory Data

SDG ID: GCE55698  
 Phoenix ID: CE55704

Project ID: 345 MEDFORD ST SOMERVILLE  
 Client ID: MW-4

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
EPH Extraction	Completed				11/07/19	JS/JS	SW3510C
MA Petroleum Hydrocarbon (EPH)	Completed				11/06/19		MADEP EPH-04
Semi-Volatile Extraction	Completed				11/06/19	P/AK	SW3520C
MA Petroleum Hydrocarbon (VPH)	Completed				11/07/19	RM	MADEP VPH04

**Semivolatiles by SIM, PAH**

2-Methylnaphthalene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthylene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benz(a)anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(a)pyrene	ND	0.00019	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(b)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(ghi)perylene	0.00007	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(k)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Chrysene	0.00006	0.00005	mg/L	1	11/07/19	WB	SW8270D (SIM)
Dibenz(a,h)anthracene	0.00003	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluoranthene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluorene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Naphthalene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Phenanthrene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Pyrene	ND	0.00007	mg/L	1	11/07/19	WB	SW8270D (SIM)

**QA/QC Surrogates**

% 2-Fluorobiphenyl	56		%	1	11/07/19	WB	40 - 140 %
% Nitrobenzene-d5	37		%	1	11/07/19	WB	40 - 140 %
% Terphenyl-d14	64		%	1	11/07/19	WB	40 - 140 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
<b>MA EPH Aliphatic/Aromatic Ranges</b>							
C11-C22 Aromatic Hydrocarbons 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C11-C22 Aromatic Hydrocarbons Unadj	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
Total TPH 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
<b>QA/QC Surrogates</b>							
% 1-chlorooctadecane (aliphatic)	57		%	1	11/07/19	AW	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	57		%	1	11/07/19	AW	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	68		%	1	11/07/19	AW	40 - 140 %
% o-terphenyl (aromatic)	62		%	1	11/07/19	AW	40 - 140 %
<b>MA Volatile Petroleum Hydrocarbons (VPH)</b>							
Unadjusted C5-C8 Aliphatics (*1)	0.17	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
Unadjusted C9-C12 Aliphatics (*1)	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C5-C8 Aliphatic Hydrocarbons *1,2	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C9-C12 Aliphatic Hydrocarbons *1,3	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C9-C10 Aromatic Hydrocarbons *1	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
Benzene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
Ethyl Benzene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
MTBE	0.21	0.005	mg/L	5	11/07/19	RM	MA VPH 5/2004
Naphthalene	ND	0.005	mg/L	1	11/07/19	RM	MA VPH 5/2004
Toluene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
m,p-Xylenes	ND	0.002	mg/L	1	11/07/19	RM	MA VPH 5/2004
o-Xylene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
<b>QA/QC Surrogates</b>							
% 2,5-Dibromotoluene (FID)	81		%	1	11/07/19	RM	70 - 130 %
% 2,5-Dibromotoluene (PID)	79		%	1	11/07/19	RM	70 - 130 %

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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3 = This parameter exceeds laboratory specified limits.

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

MAEPH:

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

VPH:

\*1 Range data exclude conc.s of any surrogate(s) and/or Int. std.s eluting in that range.

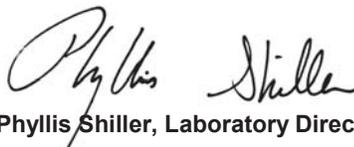
\*2 C5-C8 and C9-C12 Aliphatic exclude the conc. of Target Analytes in that range.

\*3 C9-C12 Aliphatic also exclude C9-C10 Aromatic Hydrocarbon

Semi-Volatile Comment:

Poor surrogate recovery was observed for one acid and/or one base surrogate. The other surrogates associated with this sample were within QA/QC criteria. No significant bias suspected.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



**Phyllis Shiller, Laboratory Director**

**November 11, 2019**

**Reviewed and Released by: Rashmi Makol, Project Manager**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 November 11, 2019

FOR: Attn: Mr. Steve Iorio  
 IES, Inc.  
 50 Salem Street, Building A-Suite 108  
 Lynnfield, MA 01940

Sample Information

Matrix: GROUND WATER  
 Location Code: IESINC  
 Rush Request: Standard  
 P.O.#:

Custody Information

Collected by: JB  
 Received by: B  
 Analyzed by: see "By" below

Date

10/30/19  
 11/06/19

Time

11:12  
 17:19

Laboratory Data

SDG ID: GCE55698  
 Phoenix ID: CE55705

Project ID: 345 MEDFORD ST SOMERVILLE  
 Client ID: MW-5A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.001	0.001	mg/L	1	11/07/19	CPP	SW6010D
Arsenic	< 0.004	0.004	mg/L	1	11/07/19	CPP	SW6010D
Barium	0.047	0.002	mg/L	1	11/07/19	CPP	SW6010D
Beryllium	< 0.001	0.001	mg/L	1	11/07/19	CPP	SW6010D
Cadmium	< 0.001	0.001	mg/L	1	11/07/19	CPP	SW6010D
Chromium	< 0.001	0.001	mg/L	1	11/07/19	CPP	SW6010D
Mercury	< 0.0002	0.0002	mg/L	1	11/07/19	MGH	SW7470A
Nickel	0.002	0.001	mg/L	1	11/07/19	CPP	SW6010D
Lead	< 0.002	0.002	mg/L	1	11/07/19	CPP	SW6010D
Antimony	< 0.005	0.005	mg/L	1	11/07/19	CPP	SW6010D
Selenium	< 0.010	0.010	mg/L	1	11/07/19	CPP	SW6010D
Thallium	< 0.001	0.001	mg/L	1	11/07/19	RS	SW7010
Vanadium	0.003	0.002	mg/L	1	11/07/19	CPP	SW6010D
Zinc	0.005	0.004	mg/L	1	11/07/19	CPP	SW6010D
Mercury Digestion	Completed				11/07/19	LS/LS	SW7470A
EPH Extraction	Completed				11/07/19	JS/JS	SW3510C
MA Petroleum Hydrocarbon (EPH)	Completed				11/06/19		MADEP EPH-04
Semi-Volatile Extraction	Completed				11/06/19	P/AK	SW3520C
Total Metals Digestion	Completed				11/06/19	AG	
MA Petroleum Hydrocarbon (VPH)	Completed				11/07/19	RM	MADEP VPH04

**Semivolatiles by SIM, PAH**

2-Methylnaphthalene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Acenaphthylene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benz(a)anthracene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(a)pyrene	ND	0.00019	mg/L	1	11/07/19	WB	SW8270D (SIM)

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Benzo(b)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(ghi)perylene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Benzo(k)fluoranthene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Chrysene	ND	0.00005	mg/L	1	11/07/19	WB	SW8270D (SIM)
Dibenz(a,h)anthracene	ND	0.00002	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluoranthene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Fluorene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Indeno(1,2,3-cd)pyrene	ND	0.00009	mg/L	1	11/07/19	WB	SW8270D (SIM)
Naphthalene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Phenanthrene	ND	0.00047	mg/L	1	11/07/19	WB	SW8270D (SIM)
Pyrene	ND	0.00007	mg/L	1	11/07/19	WB	SW8270D (SIM)
<b><u>QA/QC Surrogates</u></b>							
% 2-Fluorobiphenyl	59		%	1	11/07/19	WB	40 - 140 %
% Nitrobenzene-d5	42		%	1	11/07/19	WB	40 - 140 %
% Terphenyl-d14	66		%	1	11/07/19	WB	40 - 140 %
<b><u>MA EPH Aliphatic/Aromatic Ranges</u></b>							
C11-C22 Aromatic Hydrocarbons 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C11-C22 Aromatic Hydrocarbons Unadj	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
Total TPH 1,2*	ND	0.19	mg/L	1	11/07/19	AW	MAEPH 5/2004
<b><u>QA/QC Surrogates</u></b>							
% 1-chlorooctadecane (aliphatic)	57		%	1	11/07/19	AW	40 - 140 %
% 2-Bromonaphthalene (Fractionation)	72		%	1	11/07/19	AW	40 - 140 %
% 2-Fluorobiphenyl (Fractionation)	67		%	1	11/07/19	AW	40 - 140 %
% o-terphenyl (aromatic)	64		%	1	11/07/19	AW	40 - 140 %
<b><u>MA Volatile Petroleum Hydrocarbons (VPH)</u></b>							
Unadjusted C5-C8 Aliphatics (*1)	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
Unadjusted C9-C12 Aliphatics (*1)	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C5-C8 Aliphatic Hydrocarbons *1,2	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C9-C12 Aliphatic Hydrocarbons *1,3	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
C9-C10 Aromatic Hydrocarbons *1	ND	0.1	mg/L	1	11/07/19	RM	MA VPH 5/2004
Benzene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
Ethyl Benzene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
MTBE	0.0058	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
Naphthalene	ND	0.005	mg/L	1	11/07/19	RM	MA VPH 5/2004
Toluene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
m,p-Xylenes	ND	0.002	mg/L	1	11/07/19	RM	MA VPH 5/2004
o-Xylene	ND	0.001	mg/L	1	11/07/19	RM	MA VPH 5/2004
<b><u>QA/QC Surrogates</u></b>							
% 2,5-Dibromotoluene (FID)	79		%	1	11/07/19	RM	70 - 130 %
% 2,5-Dibromotoluene (PID)	81		%	1	11/07/19	RM	70 - 130 %

Client ID: MW-5A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:****MAEPH:**

1\* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.

2\* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

**VPH:**

\*1 Range data exclude conc.s of any surrogate(s) and/or Int. std.s eluting in that range.

\*2 C5-C8 and C9-C12 Aliphatic exclude the conc. of Target Analytes in that range.

\*3 C9-C12 Aliphatic also exclude C9-C10 Aromatic Hydrocarbon

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.

The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

**Phyllis Shiller, Laboratory Director****November 11, 2019****Reviewed and Released by: Rashmi Makol, Project Manager**



**Environmental Laboratories, Inc.**  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
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# QA/QC Report

November 11, 2019

## QA/QC Data

SDG I.D.: GCE55698

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 504910 (mg/L), QC Sample No: CE54459 (CE55705)													
Thallium - Water	BRL	0.001	<0.001	<0.001	NC	110			108			75 - 125	30
QA/QC Batch 505187 (mg/L), QC Sample No: CE55357 (CE55705)													
Mercury - Water	BRL	0.0002	<0.0002	<0.0002	NC	98.1			106			75 - 125	30

Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 75-125%

QA/QC Batch 505088 (mg/L), QC Sample No: CE54459 (CE55705)

### ICP Metals - Aqueous

Antimony	BRL	0.005	<0.005	<0.005	NC	107	109	1.9	107	108	0.9	75 - 125	20
Arsenic	BRL	0.004	<0.004	<0.004	NC	100	102	2.0	100	101	1.0	75 - 125	20
Barium	BRL	0.002	0.023	0.024	4.30	101	102	1.0	99.4	100	0.6	75 - 125	20
Beryllium	BRL	0.001	<0.001	<0.001	NC	106	107	0.9	105	105	0.0	75 - 125	20
Cadmium	BRL	0.001	<0.001	<0.001	NC	103	105	1.9	99.0	99.6	0.6	75 - 125	20
Chromium	BRL	0.001	0.002	0.002	NC	102	104	1.9	100	100	0.0	75 - 125	20
Lead	BRL	0.002	<0.002	<0.002	NC	98.1	99.5	1.4	96.6	97.2	0.6	75 - 125	20
Nickel	BRL	0.001	0.009	0.008	11.8	101	103	2.0	98.7	99.4	0.7	75 - 125	20
Selenium	BRL	0.010	<0.010	<0.010	NC	97.6	99.1	1.5	97.2	95.9	1.3	75 - 125	20
Silver	BRL	0.001	<0.001	<0.001	NC	102	103	1.0	103	104	1.0	75 - 125	20
Vanadium	BRL	0.002	0.003	0.003	NC	102	103	1.0	101	103	2.0	75 - 125	20
Zinc	BRL	0.004	0.004	0.004	NC	101	103	2.0	100	100	0.0	75 - 125	20



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# QA/QC Report

November 11, 2019

## QA/QC Data

SDG I.D.: GCE55698

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								

QA/QC Batch 505189 (ug/L), QC Sample No: CE54986 (CE55698, CE55699, CE55700, CE55701, CE55702, CE55703, CE55704, CE55705)

### MAEPH - Ground Water

C11-C22 Aromatic Hydrocarbons 1	ND	100	85	71	17.9				40 - 140	25
C11-C22 Aromatic Hydrocarbons U	ND	100							40 - 140	25
C19-C36 Aliphatic Hydrocarbons 1*	ND	100	81	68	17.4				40 - 140	25
C9-C18 Aliphatic Hydrocarbons 1*	ND	100	47	45	4.3				40 - 140	25
Total TPH 1,2*	ND	100	67	58	14.4				40 - 140	25
% 1-chlorooctadecane (aliphatic)	64	%	70	68	2.9				40 - 140	25
% 2-Bromonaphthalene (Fractionati	67	%	85	77	9.9				40 - 140	25
% 2-Fluorobiphenyl (Fractionation)	75	%	86	81	6.0				40 - 140	25
% 2-Methylnaphthalene BT		%	2.5	0	NC				0 - 5	
% Naphthalene BT		%	0	0	NC				0 - 5	
% o-terphenyl (aromatic)	70	%	77	66	15.4				40 - 140	25

Comment:

Additional EPH fractionation criteria: Breakthrough criteria (BT) is 0 to 5%

QA/QC Batch 505082 (ug/L), QC Sample No: CE54190 (CE55698, CE55699, CE55700, CE55701, CE55702, CE55703, CE55704, CE55705)

### Semivolatiles by SIM, PAH - Ground Water

2-Methylnaphthalene	ND	0.50	57	53	7.3				40 - 140	20
Acenaphthene	ND	0.50	69	66	4.4				40 - 140	20
Acenaphthylene	ND	0.10	68	65	4.5				40 - 140	20
Anthracene	ND	0.10	74	73	1.4				40 - 140	20
Benz(a)anthracene	ND	0.05	64	68	6.1				40 - 140	20
Benzo(a)pyrene	ND	0.20	47	62	27.5				40 - 140	20
Benzo(b)fluoranthene	ND	0.07	57	72	23.3				40 - 140	20
Benzo(ghi)perylene	ND	0.02	45	63	33.3				40 - 140	20
Benzo(k)fluoranthene	ND	0.10	55	72	26.8				40 - 140	20
Chrysene	ND	0.05	61	69	12.3				40 - 140	20
Dibenz(a,h)anthracene	ND	0.02	41	61	39.2				40 - 140	20
Fluoranthene	ND	0.50	74	72	2.7				40 - 140	20
Fluorene	ND	0.10	74	73	1.4				40 - 140	20
Indeno(1,2,3-cd)pyrene	ND	0.10	50	72	36.1				40 - 140	20
Naphthalene	ND	0.50	54	51	5.7				40 - 140	20
Phenanthrene	ND	0.06	71	68	4.3				40 - 140	20
Pyrene	ND	0.07	75	74	1.3				40 - 140	20
% 2-Fluorobiphenyl	61	%	62	59	5.0				40 - 140	20
% Nitrobenzene-d5	58	%	58	55	5.3				40 - 140	20
% Terphenyl-d14	72	%	56	62	10.2				40 - 140	20

Comment:

Additional 8270 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 10-110%, for soils 30-130%)

QA/QC Data

SDG I.D.: GCE55698

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								

QA/QC Batch 505289 (ug/L), QC Sample No: CE55698 (CE55698, CE55699, CE55700, CE55701, CE55702, CE55703 (1X, 5X) , CE55704 (1X, 5X) , CE55705)

Volatile Petroleum Hydrocarbons - Ground Water

Unadjusted C5-C8 Aliphatics (*1)	ND	100	104	108	3.8	104	102	1.9	70 - 130	20
Unadjusted C9-C12 Aliphatics (*1)	ND	100	96	100	4.1	99	90	9.5	70 - 130	20
C5-C8 Aliphatic Hydrocarbons *1,2	ND	100	104	108	3.8	103	100	3.0	70 - 130	20
C9-C12 Aliphatic Hydrocarbons *1,	ND	100	96	100	4.1	94	85	10.1	70 - 130	20
C9-C10 Aromatic Hydrocarbons *1	ND	100	106	110	3.7	105	102	2.9	70 - 130	20
Benzene	ND	1.0	103	107	3.8	106	104	1.9	70 - 130	20
Ethyl Benzene	ND	1.0	101	105	3.9	104	102	1.9	70 - 130	20
MTBE	ND	1.0	101	101	0.0	103	101	2.0	70 - 130	20
Naphthalene	ND	5.0	99	99	0.0	99	96	3.1	70 - 130	20
Toluene	ND	1.0	98	102	4.0	102	100	2.0	70 - 130	20
m,p-Xylenes	ND	2.0	101	105	3.9	103	101	2.0	70 - 130	20
o-Xylene	ND	1.0	100	104	3.9	104	102	1.9	70 - 130	20
% 2,5-Dibromotoluene (PID)	82	%	81	81	0.0	85	81	4.8	70 - 130	20

Comment:

A blank MS/MSD was analyzed with this batch.

r = This parameter is outside laboratory RPD specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference

  
 Phyllis Shiller, Laboratory Director  
 November 11, 2019

Monday, November 11, 2019

Criteria: MA: CAM, GW2, S1

State: MA

## Sample Criteria Exceedances Report

GCE55698 - IESINC

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
--------	-------	-----------------	----------	--------	----	----------	----------------	-------------------

\*\*\* No Data to Display \*\*\*

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

## MassDEP Analytical Protocol Certification Form

**Laboratory Name:** Phoenix Environmental Laboratories, Inc. **Project #:**

**Project Location:** 345 MEDFORD ST SOMERVILLE **RTN:**

**This Form provides certifications for the following data set: [list Laboratory Sample ID Number(s)]**

CE55698, CE55699, CE55700, CE55701, CE55702, CE55703, CE55704, CE55705

Matrices:  Groundwater/Surface Water  Soil/Sediment  Drinking Water  Air  Other:

**CAM Protocol (check all that apply below)**

8260 VOC CAM II A <input type="checkbox"/>	7470/7471 Hg CAM III B <input checked="" type="checkbox"/>	MassDEP VPH CAM IV A <input checked="" type="checkbox"/>	8081 Pesticides CAM V B <input type="checkbox"/>	7196 Hex Cr CAM VI B <input type="checkbox"/>	MassDEP APH CAM IX A <input type="checkbox"/>
8270 SVOC CAM II B <input type="checkbox"/>	7010 Metals CAM III C <input checked="" type="checkbox"/>	MassDEP EPH CAM IV B <input checked="" type="checkbox"/>	8151 Herbicides CAM V C <input type="checkbox"/>	8330 Explosives CAM VIII A <input type="checkbox"/>	TO-15 VOC CAM IX B <input type="checkbox"/>
6010 Metals CAM III A <input checked="" type="checkbox"/>	6020 Metals CAM III D <input type="checkbox"/>	8082 PCB CAM V A <input type="checkbox"/>	9012 Total Cyanide/PAC CAM V1 A <input type="checkbox"/>	6860 Perchlorate CAM VIII B <input type="checkbox"/>	

**Affirmative responses to questions A through F are required for "Presumptive Certainty" status**

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature*) in the field or laboratory, and prepared/analyzed with method holding times? (* see narrative)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
E	a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 methods only: Was the complete analyte list reported for each method?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**Responses to questions G, H and I below is required for "Presumptive Certainty" status**

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
---	---	---

**Data User Note: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056(2)(k) and WSC-07-350**

H	Were all QC performance standards specified in the CAM protocol(s) achieved? See Section: SVOASIM Narration .	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

*All negative responses must be addressed in an attached laboratory narrative.*

**I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, accurate and complete.**

Authorized Signature: Rashmi Makol

Date: Monday, November 11, 2019

Printed Name: Rashmi Makol

Position: Project Manager



**Environmental Laboratories, Inc.**  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823



## MCP Certification Report

November 11, 2019

SDG I.D.: GCE55698

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### **SDG Comments**

Phoenix reporting levels may exceed those referenced in the CAM protocol. Please refer to criteria sheet for comparisons to requested MCP standards.

### **AA Metals (TL) Narration**

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

#### **Instrument:**

**PE600-1 11/07/19 08:29** Rick Schweitzer, Chemist 11/07/19

CE55705

The initial calibration met criteria.

The continuing calibration standards met criteria for all the elements reported. The linear range is defined daily by the calibration range.

The continuing calibration blanks were less than the reporting level for the elements reported.

The CRDL met criteria.

The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.

The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

The following samples did not meet analytical spike criteria: None.

#### **QC (Batch Specific):**

**Batch 504910 (CE54459)**

CE55705

All LCS recoveries were within 75 - 125 with the following exceptions: None.

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### **EPH Narration**

Were all QA/QC performance criteria specified in the MADEP document CAM achieved? Yes.

#### **Instrument:**

**AU-FID3 11/07/19-1** Adam Werner, Chemist 11/07/19

CE55698, CE55699, CE55700, CE55701, CE55702, CE55703, CE55704, CE55705

No significant modifications were made to the EPH method, as specified in Section 11.3 of the method.

The initial calibration (AR0913BI) RSD for the compound list was less than 20% except for the following compounds: None.

The continuing calibration %D for the compound list was less than 25% except for the following compounds:None.

**AU-FID4 11/07/19-1** Adam Werner, Chemist 11/07/19

CE55698, CE55699, CE55700, CE55701, CE55702, CE55703, CE55704, CE55705

The initial calibration (ALO23BI) RSD for the compound list was less than 20% except for the following compounds: None.

The continuing calibration %D for the compound list was less than 25% except for the following compounds:None.

#### **QC (Batch Specific):**

**Batch 505189 (CE54986)**

CE55698, CE55699, CE55700, CE55701, CE55702, CE55703, CE55704, CE55705

All LCS recoveries were within 40 - 140 with the following exceptions: None.

All LCSD recoveries were within 40 - 140 with the following exceptions: None.

All LCS/LCSD RPDs were less than 25% with the following exceptions: None.



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## MCP Certification Report

November 11, 2019

SDG I.D.: GCE55698

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### ***EPH Narration***

Additional EPH fractionation criteria: Breakthrough criteria (BT) is 0 to 5%

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

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### ***Mercury Narration***

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

#### **Instrument:**

**MERLIN 11/07/19 07:31** Mike Hornak, Chemist 11/07/19  
CE55705

The method preparation blank contains all of the acids and reagents as the samples; the instrument blanks do not. The initial calibration met all criteria including a standard run at or below the reporting level.

All calibration verification standards (ICV, CCV) met criteria.

All calibration blank verification standards (ICB, CCB) met criteria.

The matrix spike sample is used to identify spectral interference for each batch of samples, if within 85-115%, no interference is observed and no further action is taken.

The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.

The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

#### **QC (Batch Specific):**

##### **Batch 505187 (CE55357)**

CE55705

All LCS recoveries were within 75 - 125 with the following exceptions: None.

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 75-125%

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### ***ICP Metals Narration***

Were all QA/QC performance criteria specified in the analytical method achieved? Yes.

#### **Instrument:**

**BLUE 11/07/19 08:10** Cindy Pearce, Chemist 11/07/19  
CE55705

The initial calibration met criteria.

The continuing calibration standards met criteria for all the elements reported. The linear range is defined daily by the calibration range.

The continuing calibration blanks were less than the reporting level for the elements reported.

The ICSA and ICSAB were analyzed at the beginning and end of the run and were within criteria. The linear range is defined daily by the calibration range.

The following Initial Calibration Verification (ICV) compounds did not meet criteria: None.

The following Continuing Calibration Verification (CCV) compounds did not meet criteria: None.

The following ICP Interference Check (ICSAB) compounds did not meet criteria: None.

#### **QC (Batch Specific):**

##### **Batch 505088 (CE54459)**

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## Certification Report

November 11, 2019

SDG I.D.: GCE55698

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### **ICP Metals Narration**

CE55705

All LCS recoveries were within 75 - 125 with the following exceptions: None.  
All LCSD recoveries were within 75 - 125 with the following exceptions: None.  
All LCS/LCSD RPDs were less than 20% with the following exceptions: None.

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### **SVOASIM Narration**

Were all QA/QC performance criteria specified in the MADEP document CAM achieved? No.

**QC Batch 505082 (Samples: CE55698, CE55699, CE55700, CE55701, CE55702, CE55703, CE55704, CE55705): -----**

**The LCS/LCSD RPD exceeds the method criteria for one or more analytes, but these analytes were not reported in the sample(s) so no variability is suspected. (Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Indeno(1,2,3-cd)pyrene)**

**The LCS/LCSD RPD exceeds the method criteria for one or more analytes, therefore there may be variability in the reported result. (Benzo(ghi)perylene, Dibenz(a,h)anthracene)**

#### **Instrument:**

**CHEM25 11/07/19-1**

Wes Bryon, Chemist 11/07/19

CE55702, CE55703, CE55704, CE55705

For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

Initial Calibration Evaluation (CHEM25/25\_SIM18\_1031):

100% of target compounds met criteria.

The following compounds had %RSDs >20%: None.

The following compounds did not meet recommended response factors: None.

The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM25/1107\_03-25\_SIM18\_1031) (MCP Compliance):

Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.

100% of target compounds met criteria.

The following compounds did not meet % deviation criteria: None.

The following compounds did not meet maximum % deviations: None.

The following compounds did not meet recommended response factors: None.

The following compounds did not meet minimum response factors: None.

**CHEM27 11/07/19-1**

Wes Bryon, Chemist 11/07/19

CE55698, CE55699, CE55700, CE55701

For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

Initial Calibration Evaluation (CHEM27/27\_BNSIM18\_1023):

100% of target compounds met criteria.

The following compounds had %RSDs >20%: None.

The following compounds did not meet recommended response factors: None.

The following compounds did not meet a minimum response factors: None.

Continuing Calibration Verification (CHEM27/1107\_03-27\_BNSIM18\_1023) (MCP Compliance):



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## MCP Certification Report

November 11, 2019

SDG I.D.: GCE55698

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### **SVOASIM Narration**

Internal standard areas were within 50 to 200% of the initial calibration with the following exceptions: None.

95% of target compounds met criteria.

The following compounds did not meet % deviation criteria: None.

The following compounds did not meet maximum % deviations: None.

The following compounds did not meet recommended response factors: None.

The following compounds did not meet minimum response factors: None.

### **QC (Batch Specific):**

#### **Batch 505082 (CE54190)**

CE55698, CE55699, CE55700, CE55701, CE55702, CE55703, CE55704, CE55705

All LCS recoveries were within 40 - 140 with the following exceptions: None.

All LCSD recoveries were within 40 - 140 with the following exceptions: None.

All LCS/LCSD RPDs were less than 20% with the following exceptions: Benzo(a)pyrene(27.5%), Benzo(b)fluoranthene(23.3%), Benzo(ghi)perylene(33.3%), Benzo(k)fluoranthene(26.8%), Dibenz(a,h)anthracene(39.2%), Indeno(1,2,3-cd)pyrene(36.1%)

Additional 8270 criteria: 10% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 10-110%, for soils 30-130%)

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

---

### **VPH Narration**

Were all QA/QC performance criteria specified in the MADEP document CAM achieved? Yes.

#### **Instrument:**

**PIDFID 11/06/19-1**

Raman Makol, Chemist 11/06/19

CE55698, CE55699, CE55700, CE55701, CE55702, CE55703, CE55704, CE55705

### **QC (Batch Specific):**

#### **Batch 505289 (CE55698)**

CE55698, CE55699, CE55700, CE55701, CE55702, CE55703, CE55704, CE55705

All LCS recoveries were within 70 - 130 with the following exceptions: None.

All LCSD recoveries were within 70 - 130 with the following exceptions: None.

All LCS/LCSD RPDs were less than 20% with the following exceptions: None.

A blank MS/MSD was analyzed with this batch.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.



### EPH Fractionation Standard

SDG I.D.: GCE55698

Effective Date(s): 01/01/19 - 01/01/20

Analyst: aw

AS #	TV	20ml	22ml	25ml	30ml	% Rec1	% Rec2	% Rec3	% Rec4	Rec Limits
Napthalene	40	29.07	25.21	26.79	27.50	72.7	63.0	67.0	68.8	40-140
2-Methylnaphthalene	40	29.38	25.00	26.56	26.37	73.4	62.5	66.4	65.9	40-140
Acenaphthalene	40	27.84	26.03	27.27	27.96	69.6	65.1	68.2	69.9	40-140
Acenaphthene	40	28.33	26.52	27.80	28.46	70.8	66.3	69.5	71.2	40-140
C9 - Nonane	40	14.24	14.96	14.72	16.54	35.6	37.4	36.8	41.4	40-140
C-10 Decane	40	19.60	20.53	19.99	19.59	49.0	51.3	50.0	49.0	40-140
Fluorene	40	30.43	26.85	28.06	28.49	76.1	67.1	70.1	71.2	40-140
C12 - Dodecane	40	23.94	24.94	24.29	23.93	59.8	62.3	60.7	59.8	40-140
Phenanthrene	40	28.88	26.42	28.17	28.74	72.2	66.1	70.4	71.9	40-140
Anthracene	40	30.28	27.00	28.64	28.70	75.7	67.5	71.6	71.8	40-140
C14 - Tetradecane	40	25.84	27.22	26.41	26.16	64.6	68.1	66.0	65.4	40-140
C16 - Hexadecane	40	27.33	28.78	28.18	29.40	68.3	71.9	70.4	73.5	40-140
Fluoranthene	40	26.66	23.93	25.51	25.75	66.6	59.8	63.8	64.4	40-140
C18 - Octadecane	40	28.14	29.82	29.74	30.29	70.4	74.5	74.4	75.7	40-140
Pyrene	40	28.23	23.73	25.55	25.56	70.6	59.3	63.9	63.9	40-140
Benzo(a)anthracene	40	27.98	23.04	25.56	26.23	69.9	57.6	63.9	65.6	40-140
Chrysene	40	30.41	21.98	28.13	26.63	76.0	54.9	70.3	66.6	40-140
Benzo(b/k)fluoranthene (c)	80	55.04	49.58	52.79	52.21	68.8	62.0	66.0	65.3	40-140
Benzo(a)pyrene	40	30.15	26.66	24.88	24.10	75.4	66.6	62.2	60.3	40-140
Indeno/Dibenz(copk)	80	50.82	51.28	46.48	50.01	63.5	64.1	58.1	62.5	40-140
Benzo(ghi)perylene	40	30.57	30.80	26.05	26.44	76.4	77.0	65.1	66.1	40-140
C19 - Nonadecane	40	28.94	30.51	30.55	31.40	72.4	76.3	76.4	78.5	40-140
C20 - Eicosane	40	28.67	29.78	30.17	31.33	71.7	74.4	75.4	78.3	40-140
C22 - Docosane	40	28.10	28.68	28.73	30.25	70.3	71.7	71.8	75.6	40-140
C24 - Tetracosane	40	28.36	29.39	29.13	30.44	70.9	73.5	72.8	76.1	40-140
C26 - Hexacosane	40	28.40	30.03	29.45	30.55	71.0	75.1	73.6	76.4	40-140
C28 - Octacosane	40	30.66	32.31	31.96	33.00	76.6	80.8	79.9	82.5	40-140
C30 - Tricotane	40	28.64	29.93	29.68	30.69	71.6	74.8	74.2	76.7	40-140
C36 - Hexatriacontane	40	31.38	33.40	32.73	33.70	78.4	83.5	81.8	84.2	40-140

Notes: EPH Frac Check Solution EPH10b-solvent transfer into hex, frac 1ml. Dilute 5x to run tv=40 Lot:140118-1165992  
AU-FID3 10/29/18 EPH O29\_062/O29\_064/O29\_066/O29\_068



## **Bobbi Aloisa**

---

**From:** Chris Buchanan <[cbuchanan@iesinc.com](mailto:cbuchanan@iesinc.com)>  
**Sent:** Thursday, November 07, 2019 9:03 AM  
**To:** Bobbi Aloisa  
**Subject:** Re: 345 Medford Question

Please run the target PAHs just in cas. Thank you. Chris

Sent from my Sprint Samsung Galaxy S7.

----- Original message -----

**From:** Bobbi Aloisa <[bobbi@phoenixlabs.com](mailto:bobbi@phoenixlabs.com)>  
**Date:** 11/6/19 3:49 PM (GMT-05:00)  
**To:** Chris Buchanan <[cbuchanan@iesinc.com](mailto:cbuchanan@iesinc.com)>, Tara Banning <[tara@phoenixlabs.com](mailto:tara@phoenixlabs.com)>  
**Subject:** 345 Medford Question

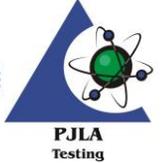
**Chris**

**Samples are here, I see that you wrote “eph” on some lines and then “EPH with PAHS” on others.**

**The samples that just have “EPH” written on them, I am assuming you don’t want PAH targets reported on those samples?**

**Bobbi**

**Bobbi Aloisa  
Vice President  
Director of Client Services  
Phoenix Environmental Laboratories  
587 East Middle Turnpike  
Manchester, CT 06040  
Ph: 860-645-8728**



Accreditation#

98218

11/1/2019

## IES, Inc.

**MicroVision Labs Coal Ash Report, Job Number 13289**

**IES Project Number: 2018-08-0527**

**IES Project Name: 345 Medford Street, Somerville**

### Scope of Work:

This report covers the methods and findings of the Coal/Coal Ash analysis that MicroVision Laboratories, Inc. conducted on two (2) soil samples submitted for testing from the 345 Medford Street, Somerville project, number 2018-08-0527. The purpose of this analysis was to detect and document any coal, coal ash, wood ash or asphalt that may be present in the submitted soil samples by use of a combination of microscopy techniques including SEM/EDS, PLM, and macroscopic inspection.

### Methods:

MicroVision Labs is accredited to the ISO/IEC 17025:2017 standard. This analysis follows our in house SOP #MVL05 (Microscopic Analysis for Coal, Coal Ash and Wood Ash). This method is listed on our certificate of accreditation and has been validated.

### Findings:

The following pages display the data for each particle type detected in the samples for this project. Each page contains a PLM image, SEM image, and EDS spectrum for the particle types detected for these samples as well as particle type descriptions and observations.

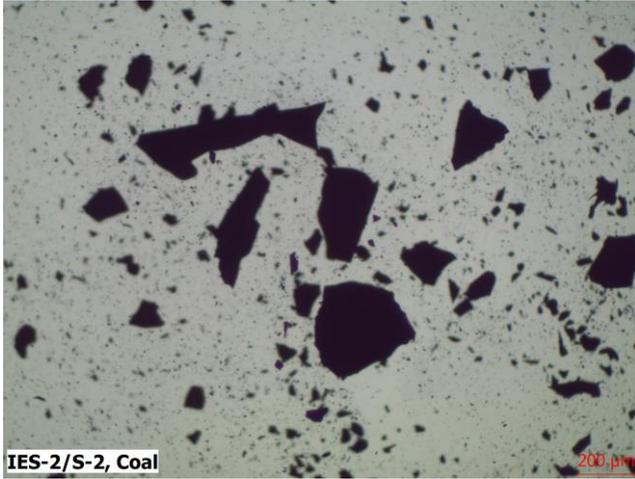
### ISO/IEC 17025:2017 Accredited

MicroVision Laboratories, Inc. 187 Billerica Road, Chelmsford, MA 01824  
Phone: (978) 250-9909 Fax: (978) 250-9901 Email: Sales@MicroVisionLabs.com  
www.MicroVisionLabs.com

## Sample: IES-2/S-2

### Number of Suspect Particle Types: Two (2)

**Coal:** This particle type consisted of over fifty (50+) shiny, black grains approximately 1-9mm in diameter. The PLM examination indicated this particle type to be consistent with coal. The PLM and SEM images of this particle type show the angular edges and typical conchoidal fractures found in coal.

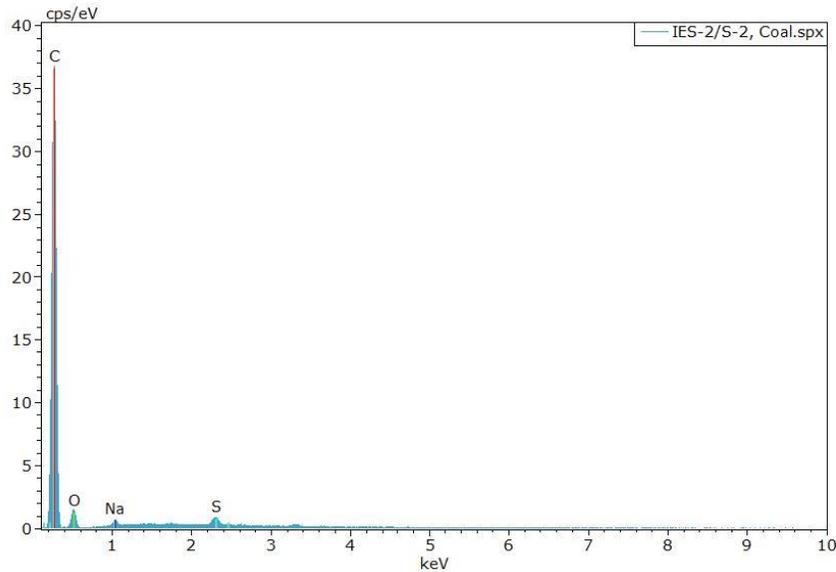


PLM Image



SEM Image

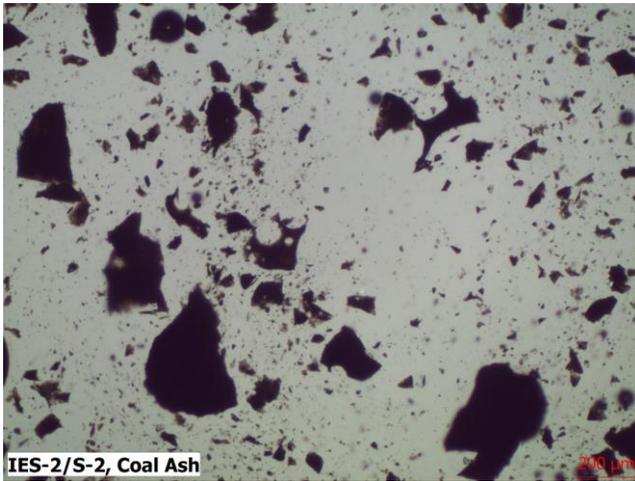
The EDS spectrum, shown below, confirms that this particle type is coal. The analysis for this particle shows concentrations of carbon, oxygen, sodium, and sulfur.



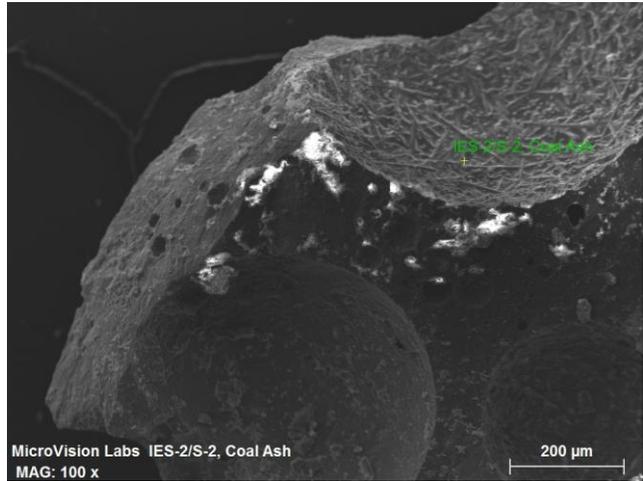
### ISO/IEC 17025:2017 Accredited

MicroVision Laboratories, Inc. 187 Billerica Road, Chelmsford, MA 01824  
Phone: (978) 250-9909 Fax: (978) 250-9901 Email: Sales@MicroVisionLabs.com  
www.MicroVisionLabs.com

**Coal Ash:** This particle type consisted of twenty-four (24) dark, porous grains approximately 1-10mm in diameter. The PLM examination indicated this particle type to be consistent with coal ash. The PLM and SEM images show the spherical gas voids that formed during combustion.

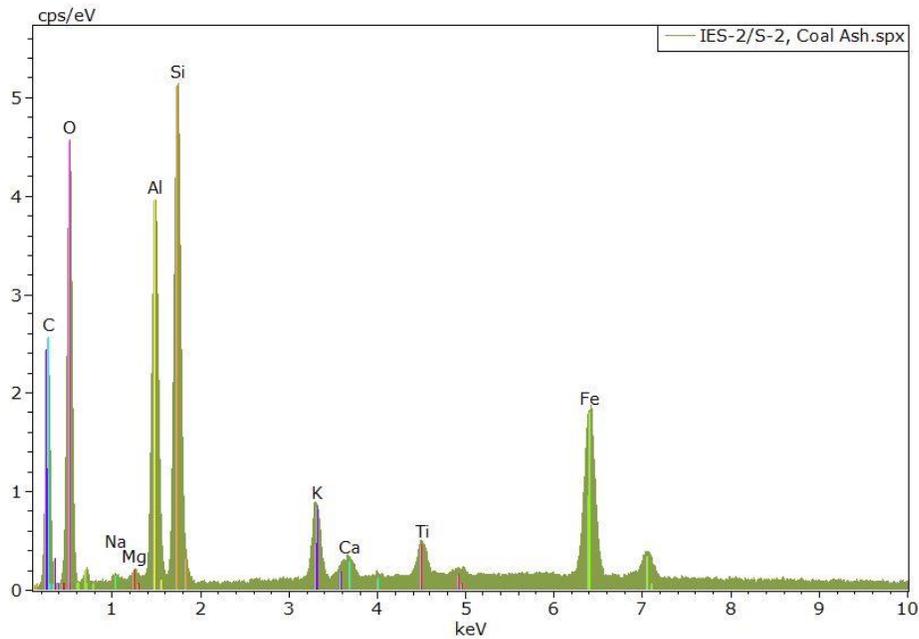


**PLM Image**



**SEM Image**

The EDS spectrum, shown below, indicates this particle type is coal ash. The analysis for this particle shows concentrations of carbon, oxygen, sodium, magnesium, aluminum, silicon, potassium, calcium, titanium, and iron.



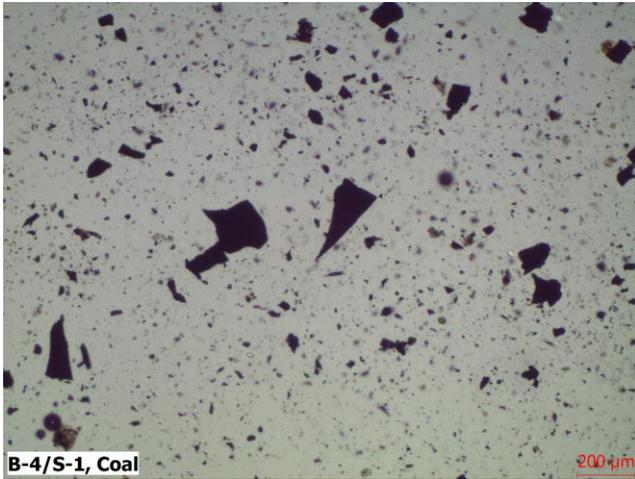
**ISO/IEC 17025:2017 Accredited**

MicroVision Laboratories, Inc. 187 Billerica Road, Chelmsford, MA 01824  
Phone: (978) 250-9909 Fax: (978) 250-9901 Email: Sales@MicroVisionLabs.com  
www.MicroVisionLabs.com

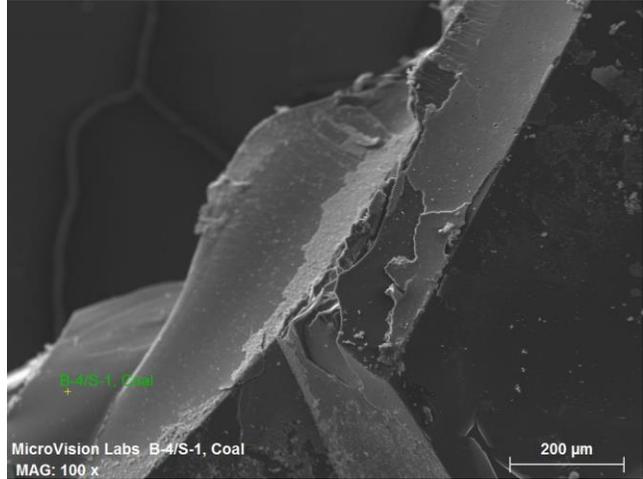
# Sample: B-4/S-1

## Number of Suspect Particle Types: Three (3)

**Coal:** This particle type consisted of thirty-two to thirty-five (32-35) shiny, black grains approximately 1-13mm in diameter. The PLM examination indicated this particle type to be consistent with coal. The PLM and SEM images of this particle type show the angular edges and typical conchoidal fractures found in coal.

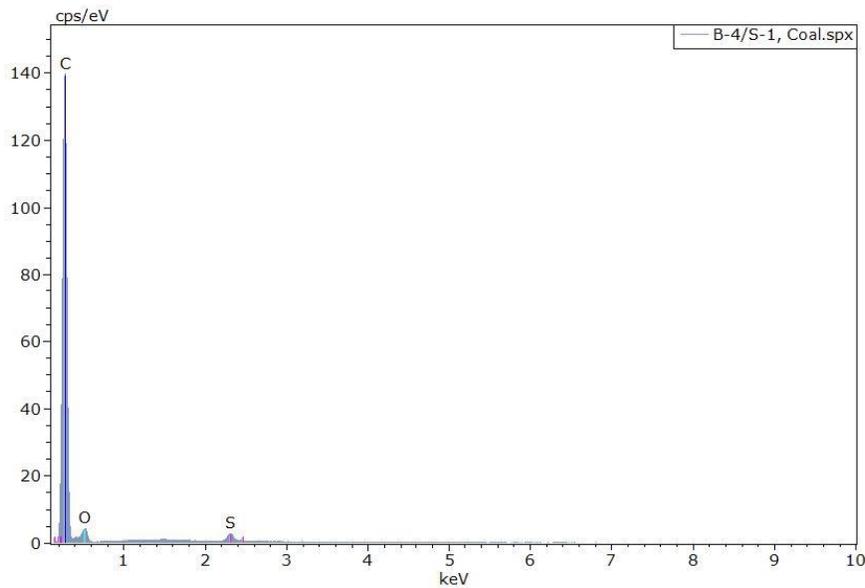


**PLM Image**



**SEM Image**

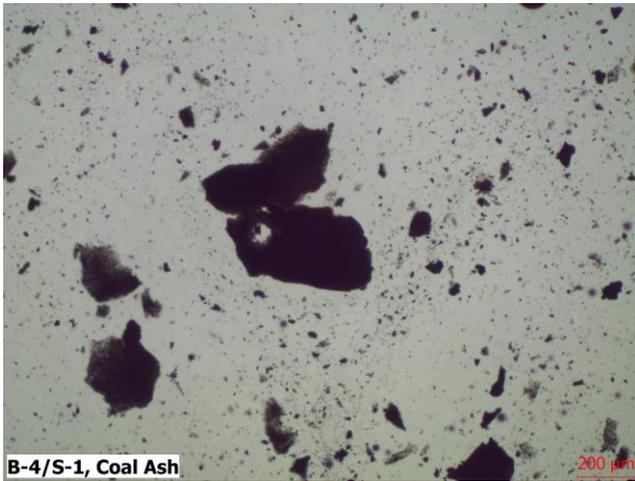
The EDS spectrum, shown below, confirms that this particle type is coal. The analysis for this particle shows concentrations of carbon, oxygen, and sulfur.



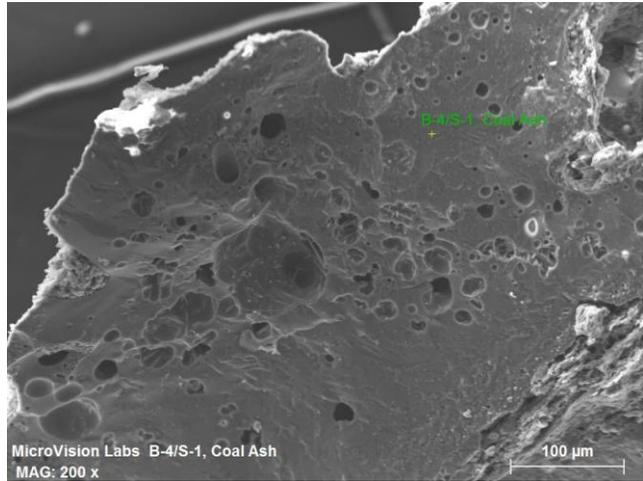
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**Coal Ash:** This particle type consisted of four (4) dark, porous grains approximately 1-6mm in diameter. The PLM examination indicated this particle type to be consistent with coal ash. The PLM and SEM images show the spherical gas voids that formed during combustion.

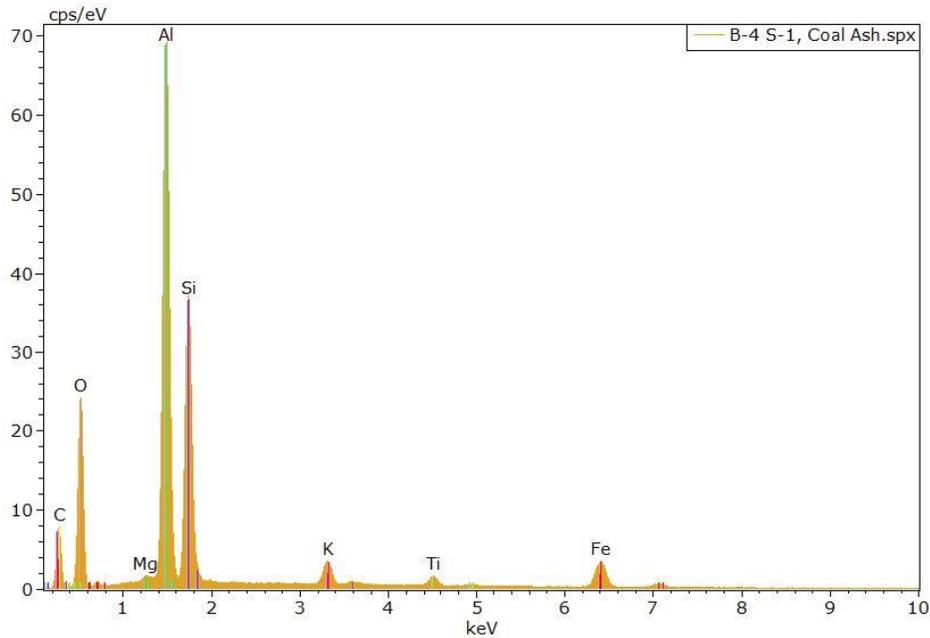


**PLM Image**



**SEM Image**

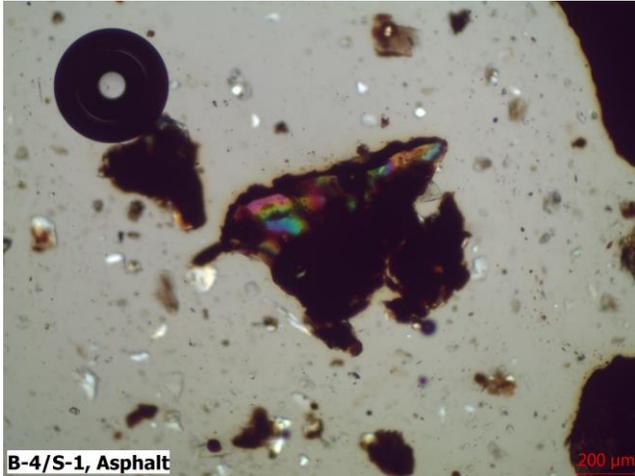
The EDS spectrum, shown below, indicates this particle type is coal ash. The analysis for this particle shows concentrations of carbon, oxygen, magnesium, aluminum, silicon, potassium, titanium and iron.



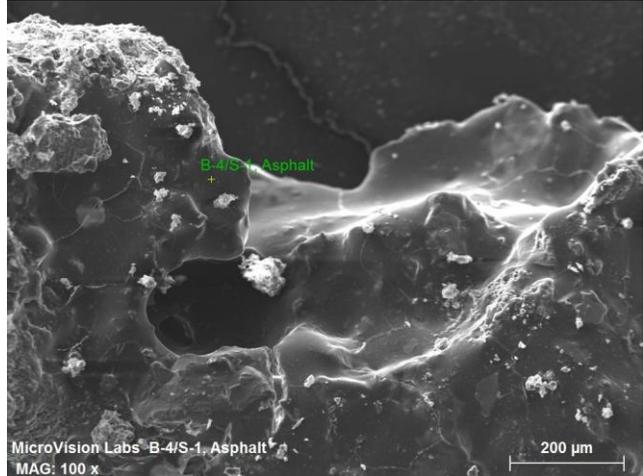
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**Asphalt:** This particle type consisted of over fifty (50+) ductile, black grains approximately 1-12mm in diameter. These grains had mineral matter embedded in and stuck to them. During the PLM examination, these particles slowly dissolved in the mounting oil which is a typical characteristic of asphalt. The PLM image shows the dissolving asphalt particles, and the SEM image illustrates the morphology of asphalt with the embedded mineral grains.

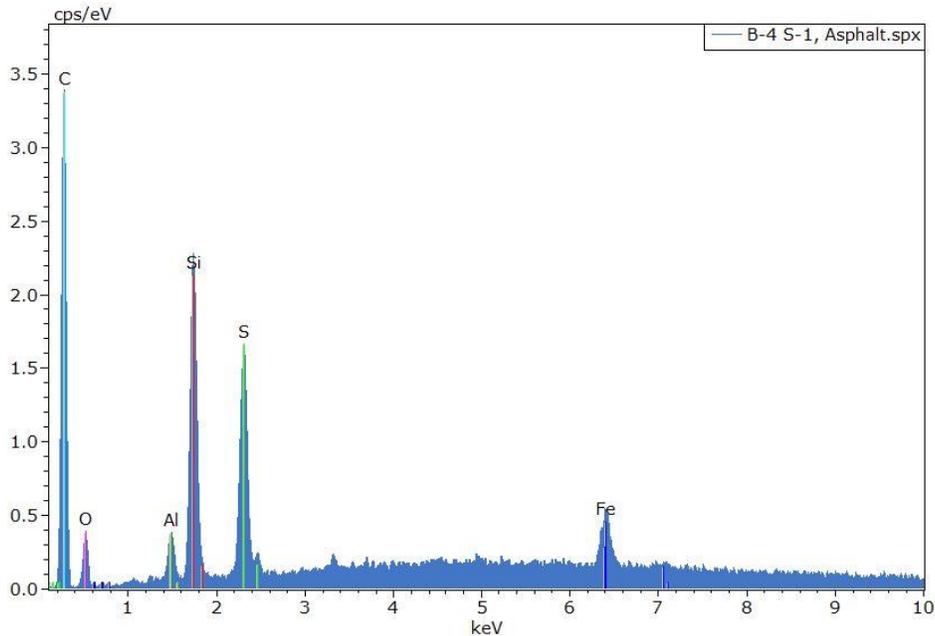


PLM Image



SEM Image

The EDS spectrum, shown below, indicates this particle type is asphalt. The analysis for this particle shows concentrations of carbon, oxygen, aluminum, silicon, sulfur, and iron.



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**Results Summary Table:**

<b>Sample Name</b>	<b>Material Detected</b>
<b>IES-2/S-2</b>	<b>Coal (heavy), Coal Ash (moderate)</b>
<b>B-4/S-1</b>	<b>Coal (moderate), Coal Ash (light), Asphalt (heavy)</b>

The concentrations of the particle types detected in these samples are listed in parenthesis in the table above and are based on the number of particles found and the relative difficulty in finding them. The concentration information is listed for informational purposes only and has no bearing on exemption status.

Please let us know if you have any questions about this analysis or if there is anything else we can do for you.

Sincerely,



Alexander Cloonan  
Analytical Microscopist

Reviewed By: TW

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LABORATORIES, INC.

Chain of Custody		Client Information		Project Information										
		Client: <b>IEF, INC.</b>		Project Name: <b>345 Audford Street Somerville</b>										
		Billing Address: <b>50 Salem St., Bldg 4-R-108 Lynnfield MA 01940</b>		Project Location: <b>345 Audford Street Somerville</b>										
		Phone: <b>617-623-8880</b>		Project Number: <b>2018-08-0527</b>										
		Fax:		Project Manager: <b>Steve Torib</b>										
		Email: <b>storie@ievinc.com</b>		PO#:										
Requested Analyses														
Sample ID	Collected Date	Sampler's Initials	Coal Ash Test	Lead Paint	SEM/EDS	PLM/Light Microscopy	Soot ID	Dust ID	Unknow Mat'l ID	FTIR	Polished Cross Section	Particle Size Analysis	Wildfire	Other
1) <b>1E5-2/5-2</b>	<b>10/24/19</b>	<b>JB</b>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>								
2) <b>B-4/5-1</b>	<b>10/24/19</b>	<b>JB</b>	<input checked="" type="checkbox"/>											
3)														
4)														
5)														
6)														
7)														
8)														
9)														
10)														
11)														
12)														
Relinquished By:		Date/Time	Received By:	Date/Time	Turn Around Time and Notes:									
		<b>11/13 10:31 AM</b>	<b>Quip Stoddard</b>	<b>11/13 10:31 AM</b>	<b>11/13 Standard TAT</b>									
Hazardous Contaminants: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		If Yes, please list: <b>Lead / PAHs</b>												
Analytical Report Requested: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO														

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