

Mr. Bernard Franklin
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Albany, New York 12233-7017

Subject:
NYSEG McMaster Street Former MGP Site
Sediment PDI Summary Report

Dear Mr. Franklin:

This letter report has been prepared on behalf of NYSEG to summarize the activities and results of the sediment Pre-Design Investigation (PDI) completed at the McMaster Street Former Manufactured Gas Plant (MGP) Site (the site) located in Auburn, New York. The objectives of the Sediment PDI were to:

- Delineate the extent of site-related impacts in Owasco Outlet (the outlet) sediment to the top of bedrock
- Refine the proposed sediment removal area (as necessary) presented in the June 2009, *Feasibility Study Report* (FS Report) (ARCADIS, 2009)

PDI activities were conducted during August and September 2010 in general accordance with the November 2009 New York State Department of Environmental Conservation (NYSDEC) Record of Decision (ROD) (NYSDEC, 2009) and the May 2010 Draft *Remedial Design Work Plan* (RDWP) (ARCADIS, 2010). NYSDEC approved implementation of the proposed sediment PDI activities in a June 30, 2010 letter to NYSEG.

PDI activities consisted of evaluating the background (i.e., upstream from the McMaster Street former MGP property) sediment quality as well as sediment adjacent to and immediately downstream from the former MGP to help delineate the extent of site-related impacts.

Prior to conducting the sediment PDI activities, ARCADIS notified the United States Army Corp of Engineers (USACE) and completed a self-governing Nationwide Permit 6 (NWP 6). Additionally, ARCADIS notified the City of Auburn of outlet investigation activities and arrangements were made with the City of Auburn Department of

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June 1, 2011

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Our ref:
B0013049 #10

Imagine the result

Municipal Utilities to regulate outlet water levels from the Mill Street Dam during sediment investigation activities. ARCADIS notified the Department of Municipal Utilities each day prior to entering the outlet and in turn, the Department of Municipal Utilities notified ARCADIS prior to flow increases within the outlet.

The following sections present descriptions of the sediment PDI activities, PDI results, and rationale (supported by the PDI results) that help to define the limits of the proposed sediment removal areas for the selected site remedy.

Background Sediment PDI Activities and Results

ARCADIS conducted background sediment sampling reconnaissance on August 12, 2010 to identify potential sampling locations. A figure and photographs documenting proposed background sediment sampling locations were provided to NYSDEC in an August 13, 2010 email and NYSDEC subsequently approved (with NYSDEC-requested modifications) the sampling locations via an August 19, 2010 email.

A total of 19 background sediment samples, including one duplicate sample, were collected from 18 sediment boring locations extending approximately ¼ mile upstream from the former MGP site. Background sediment samples were collected using stainless steel trowels at the locations shown on Figure 1. Sediment sampling locations were surveyed by ARCADIS on September 14, 2010.

ARCADIS field personnel collected sufficient sediment volume at each sampling location to facilitate splitting the samples for potential analysis at two separate laboratories. One of the split samples from each sampling location was submitted to TestAmerica, Inc. (TestAmerica) in Amherst, New York for analysis for the 17 priority pollutant polycyclic aromatic hydrocarbons (PAHs) using SW-846 Method 8270 (PAH-17). The other split sample from each sampling location was submitted to Alpha Analytical Laboratories (Alpha Analytical), located in Mansfield, Massachusetts, where they were frozen and retained for potential analysis for forensic PAHs and saturated hydrocarbons (i.e., detailed forensic analyses).

Results obtained for the analysis of background sediment samples for PAH-17 compounds are provided in Table 1. Total PAH concentrations for McMaster Street background sediment samples ranged from 13 to 300 milligrams per kilogram (mg/kg). As noted in Table 2, no visual (i.e., sheens, stains, blebs, NAPL) impacts were observed in background sediment samples.

As described in the *Forensic Evaluation Summary*, included as Attachment 2, a preliminary forensic evaluation was conducted for each of the background sediment samples. Based on the results of the preliminary forensic evaluation, eight representative background samples were selected and released from archive for detailed forensic analyses (by Alpha Analytical) to facilitate detailed forensic evaluation. Analytical results for the detailed forensic analyses are provided in Table 3. Results of the preliminary and detailed forensic evaluations indicated that the background samples had relatively similar PAH compositions to one another and PAHs appear to originate almost exclusively from non-MGP-related pyrogenic combustion sources, with negligible contributions from petroleum sources. Potential sources of PAHs were well mixed in the samples and a distinguishable specific source could not be identified.

Delineation Sampling Activities and Results

Delineation sediment sampling activities were conducted from September 15 to September 29, 2010. ARCADIS' drilling subcontractor, Parratt-Wolff, Inc. (Parratt-Wolff), completed 33 sediment borings along 11 sampling transects and at additional locations immediately adjacent to and downstream of the site. Sediment samples were collected with split barrel samplers driven to the top of bedrock using either a float-mounted tripod rig, a free-standing tripod rig, or an ATV-mounted rig, depending on the depth of water and accessibility of the sampling location. A total of 63 sediment samples were collected from the sediment boring locations at near-shore, mid-stream, and far-shore locations along the sampling transects. Each boring was completed to the top of the bedrock surface (0.7 to 6.5 feet below sediment surface [bss]). An ARCADIS geologist measured and recorded the length of the sample recovered from each interval and visually characterized each sediment sample for sediment type and the presence of visible staining, sheen, NAPL, tar, and obvious odors. Delineation sediment boring locations are shown on Figure 2.

A rock core was completed at sampling location T-05a-B from 5.5 to 10.5 feet bss using NX size coring equipment (i.e., 3-inch diameter core barrel). The rock core was collected to confirm that the sediment borings were completed to the top of bed rock and not on boulders or cobbles. The depth to bedrock measured in the sediment borings was compared to the elevation of bedrock measured in upland investigation locations (completed during the Remedial Investigation).

Similar to the background sampling activities, each delineation sediment sample was submitted to TestAmerica for laboratory analysis for PAH-17 compounds. Split volumes of each sediment sample were submitted to Alpha Analytical, frozen, and retained pending release for potential detailed forensic analyses.

Geotechnical sediment samples were collected from sampling locations PDI-01 and T-06-A/PDI-02 and submitted for particle grain-size analysis at PW-Labs located in Syracuse, New York. The geotechnical lab results are provided in Table 4.

A NAPL sample was collected from on-site monitoring well MW-06-11R and submitted to Alpha Analytical for detailed forensic analyses to provide a comparison of the PAH signature for MGP-related coal tar from the McMaster Street site to the PAH signatures observed in outlet sediment samples. Analytical results for the detailed forensic analyses of the NAPL sample are presented in Table 3.

A summary of the visual impacts observed in McMaster Street delineation samples is shown on Figure 3. As shown on Figure 3, the most significant visual impacts were observed at the following locations: T-02-A (2.7' to 3.2'), T-03-A (3' to 4'), T-07a-B (2.2' to 2.5'), and T-07a-C (2.5' to 2.8'). Note that observations of NAPL were all in sediment samples collected immediately above the top of bedrock surface at depths greater than two feet bss.

Analytical results for delineation sediment samples are provided in Table 5. Total PAH concentrations for McMaster Street delineation samples ranged from 0.62 to 3,000 mg/kg. All but five of the delineation samples contained total PAHs at concentrations within the range of PAHs detected in background sediment samples. As shown on Figure 3, sediment samples containing the highest total PAH concentrations generally coincided with sampling locations that contained the most significant visual impacts.

As indicated in the *Forensic Evaluation Summary* (Attachment 2), the preliminary forensic evaluation was conducted to identify potential PAH sources for the delineation samples. Detailed forensic results of the McMaster Street NAPL sample indicated a composition consistent with coal tar derived from the coal carbonization manufactured gas production process (i.e., the gas manufacturing process used at the McMaster Street MGP). Based on the results of the preliminary forensic evaluation, McMaster Street delineation sediment samples contained PAHs consistent with four potential compositions:

- Similar to background sediment
- Unknown, different than background, non-MGP related
- Mixture of potential coal carbonization and background
- Consistent with coal carbonization and McMaster Street NAPL

The PAH compositions of the delineation sediment samples are shown on Figure 3.

Sediment Removal Area Evaluation

Removal Area Criteria

The sediment removal area presented in the FS Report (as shown on Figure 4) was delineated based on the extent of NAPL and/or hardened tar observed during the Remedial Investigation. The ROD requires “excavation and off-site disposal of sediments, as determined by a pre-design investigation, which contain NAPL, visible tar, produce tar-related sheen when agitated in water, or which contain site-related PAH compounds that exceed background levels.”

No tar-related sheens were observed on the Outlet water surface during drilling activities. Therefore, sediment removal criteria were established to include sediment that contains the following:

- Total PAHs at concentrations greater than a site-specific background concentration (excluding non-site-related PAHs, based on the results of the forensic evaluations)
- NAPL or visible tar

Consistent with interpretation of NAPL/tar at other NYSDEC-regulated sites, minor visual impacts (e.g., sheen and/or isolated blebs noted in sediment when the cores were processed) were not considered “NAPL or visible tar”.

PAH Background Determination

The site-specific McMaster Street total PAH background concentration was determined using the total PAH concentrations detected in PDI background sediment

samples. Prior to calculating a background concentration, an interquartile range outlier test was conducted. The interquartile range is defined as the difference between the values (e.g., PAH concentrations) of the 75th percentile (third quartile) and the 25th percentile (first quartile) data points. Outliers would be considered those data points (i.e., concentrations) that fall further than one and a half times the interquartile range under the first quartile (the 25th percentile) or one and a half times the interquartile range over the third quartile (the 75th percentile). Based on the results of the interquartile range outlier test, McMaster Street sediment sample MSB-13 (with a PAH concentration of 300 mg/kg) was identified as a potential outlier and therefore, was not used in the calculation of the McMaster Street background PAH concentration. A statistical background calculation sheet is included as Attachment 3.

Consistent with background calculations completed at other NYSDEC-regulated sites, the McMaster Street background concentration was defined as the 90th percentile of the data set (i.e., the background concentrations). United States Environmental Protection Agency (USEPA) Pro UCL software was used to calculate a background concentration of 208 mg/kg.

Proposed Removal Areas

Thiessen polygons were used to estimate the limits of sediment impacted by MGP-related materials as a basis for identifying sediment removal areas and associated sediment quantities. Note that the polygons represent conceptual removal areas and may be modified during the remedial design based on accessibility and constructability.

Thiessen polygons were formed to enclose the space around each sediment sampling location using an algorithm in geographic information systems (GIS) software to calculate the midpoint between adjacent sampling locations and then connect these midpoints to form polygons. Any point inside a particular polygon is closer to the sampling location within that polygon than to any other sampling point, and therefore is considered to have the same characteristics of that sampling point within the polygon. Boundary lines for forming the polygons consisted of the outlet bank, the prison wall, and the outer edge of the ROD removal area (i.e., polygons did not divide the ROD removal area as sufficient data had been previously collected to support the removal of the entire ROD removal area).

Based on a review of the Owasco Outlet PDI results, recommended sediment removal limits include the area designated for removal in the ROD, as well as material near several PDI sediment sampling locations. The additional sediment sampling locations recommended for removal, along with the rationale for removal, are presented in the following table.

Sediment Sampling Location	Rationale for Removal
T-02-A	NAPL observed from 2.7 to 3.2 feet bss.
T-03-A	NAPL observed from 2.5 to 3 feet bss.
T-05a-B	1,400 mg/kg PAHs observed from 1 to 3 feet bss and 590 mg/kg PAHs with a coal carbonization composition observed from 3 to 5 feet bss.
T-07a-B	NAPL observed from 2.2 to 2.5 feet bss.
T-07a-C	3,000 mg/kg PAHs with a coal carbonization composition observed from 2.5 to 2.8 feet bss.
T-09-A*	240 mg/kg PAHs with a mixture of potential coal carbonization and background composition observed from 0 to 0.5 feet bss.
T-09-C	1,500 mg/kg PAHs with a coal carbonization composition observed from 2.5 to 2.8 feet bss.
T-09a-A	900 mg/kg PAHs observed from 1 to 3 feet bss and 1,700 mg/kg PAHs observed from 3 to 5 feet bss with a coal carbonization composition.

Note:

* = A sediment sample collected from sampling location T-09-A contained PAHs representative of a mixture of potential coal carbonization and background signatures. Although the PAH composition is not exclusively attributed to site related impacts, the PAH concentration of 240 mg/kg is greater than the background PAH concentration of 208 mg/kg that has been established for site sediment. Therefore, NYSEG elected to forgo the detailed forensic analyses for this sampling location and the area defined by sediment sample T-09-A is included as a proposed removal area.

Proposed sediment removal areas are shown on Figure 4. Note that no sediment sampling locations were excluded from removal based on elevated PAH concentrations attributed to non-MGP-related sources. Based on forensic evaluation

results, the PAH compositions in samples that contained total PAHs at concentrations greater than background levels were consistent with either a coal carbonization composition or a mixture of coal carbonization and background composition.

Schedule

NYSEG anticipates that upland PDI activities, as outlined in the RDWP, will be completed in the summer of 2011 and upland PDI Summary Reports are anticipated to be provided to NYSDEC in late 2011.

Please do not hesitate to contact Mr. John Ruspantini of NYSEG at 607.762.8787 or the undersigned at 315.671.9114 if you have any questions or comments regarding the information presented in this letter or any other aspects of this project.

Sincerely,

ARCADIS of New York, Inc.



Jason Brien, P.E.
Senior Engineer

Copies:

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- 2 Forensic Evaluation Summary Memorandum
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Table 1
Background Sediment PAH Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	MSB-1 0 - 0.25 8/19/2010	MSB-2 0 - 0.25 8/19/2010	MSB-3 0 - 0.25 8/19/2010	MSB-4 0 - 0.5 8/19/2010	MSB-5 0 - 0.5 8/19/2010	MSB-6 0 - 0.25 8/19/2010	MSB-7 0 - 0.333 8/19/2010	MSB-8 0 - 0.333 8/19/2010	MSB-9 0 - 0.5 8/19/2010
PAHs										
Chrysene	mg/kg	1.2	2.0	2.0	14	8.6	2.5	2.0	17	3.8
Naphthalene	mg/kg	0.10 UB	0.43 U	0.41 U	0.96	0.46 UB	0.46 U	0.40 U	0.68	0.42 U
Dibenzofuran	mg/kg	0.074 J	0.094 J	0.065 J	2.0	0.84	0.091 J	0.40 U	1.2	0.20 J
Acenaphthylene	mg/kg	0.032 J	0.43 U	0.41 U	0.24 J	0.46 U	0.46 U	0.040 J	0.23 J	0.42 U
Acenaphthene	mg/kg	0.10	0.15 J	0.12 J	2.7	1.4	0.14 J	0.40 U	1.6	0.44
Fluorene	mg/kg	0.14	0.20 J	0.15 J	3.3	1.7	0.46 U	0.40 U	2.2	0.48
Anthracene	mg/kg	0.40	0.37 J	0.39 J	5.5	3.5	0.45 J	0.50	3.9	1.1
Phenanthrene	mg/kg	2.1	3.4	2.9	33	22	3.9	4.0	32	7.0
Fluoranthene	mg/kg	3.0	5.8	5.5	39	29	7.3	6.5	49	12
Pyrene	mg/kg	2.3	4.1	3.7	28	20	4.9	4.8	34	7.9
Benzo(a)anthracene	mg/kg	1.2	2.1	1.7	15	9.7	2.3	2.1	16	3.6
Benzo(b)fluoranthene	mg/kg	1.5	3.3	3.2	20	13	4.0	3.7	26	5.8
Benzo(k)fluoranthene	mg/kg	0.71	1.3	1.1	9.2	5.3	1.6	1.1 J	11	1.8
Benzo(a)pyrene	mg/kg	1.4	2.6	2.4	18	11	3.1	2.8	21	4.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.56	1.2	1.2	6.8	4.6	1.4	1.4	9.2	1.8
Dibenz(a,h)anthracene	mg/kg	0.10 U	0.43 U	0.41 U	0.53 U	0.46 U	0.46 U	0.41	0.60 U	0.42 U
Benzo(g,h,i)perylene	mg/kg	0.55	1.3	1.2	6.7	4.9	1.5	1.5	9.1	1.8
2-Methylnaphthalene	mg/kg	0.016 J	0.43 U	0.41 U	0.60	0.15 J	0.46 U	0.40 U	0.16 J	0.42 U
Total PAHs	mg/kg	15 J	28 J	26 J	200 J	130 J	33 J	31 J	230 J	52

Table 1
Background Sediment PAH Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	MSB-10 0 - 0.417 8/19/2010	MSB-11 0 - 0.333 8/19/2010	MSB-12 0 - 0.333 8/19/2010	MSB-13 0 - 0.25 8/19/2010	MSB-14 0 - 0.25 8/19/2010	MSB-15 0 - 0.25 8/19/2010	MSB-16 0 - 0.25 8/19/2010	MSB-17 0 - 0.333 8/19/2010	MSB-17-DUP 0 - 0.333 8/19/2010	MSB-18 0 - 0.25 8/19/2010
PAHs											
Chrysene	mg/kg	16	3.1	1.7	21	1.6	0.87	0.80	1.5	1.5	0.87
Naphthalene	mg/kg	0.86 U	0.38 U	0.22 U	0.38 U	0.39 U	0.44 U	0.38 U	0.44 U	0.43 U	0.11 U
Dibenzofuran	mg/kg	1.1	0.11 J	0.084 J	1.0 J	0.39 U	0.44 U	0.38 U	0.095 J	0.085 J	0.20 J
Acenaphthylene	mg/kg	0.86 U	0.38 U	0.15 J	0.38 U	0.39 U	0.44 U	0.38 U	0.44 U	0.43 U	0.11 U
Acenaphthene	mg/kg	2.1	0.18 J	0.063 J	1.9	0.069 J	0.44 U	0.12 J	0.27 J	0.21 J	0.32
Fluorene	mg/kg	2.4	0.29 J	0.14 J	2.6	0.39 U	0.44 U	0.38 U	0.29 J	0.43 U	0.37
Anthracene	mg/kg	5.1	0.86	0.41	3.4	0.36 J	0.24 J	0.44	0.75	0.52	0.54
Phenanthrene	mg/kg	34	5.3	2.4	42	3.3	1.5	2.1	4.3	3.8	3.0 J
Fluoranthene	mg/kg	49	8.8	4.3	64	5.5	2.6	2.6	5.4	5.1	3.1 J
Pyrene	mg/kg	33	6.0	3.1	49	4.1	1.9	1.9	4.1	3.6	2.1 J
Benzo(a)anthracene	mg/kg	15	3.2	1.8	20	1.8	1.0	1.0	1.8	1.7	1.1
Benzo(b)fluoranthene	mg/kg	24	4.9	2.4	33	3.0	1.5	1.2	2.1	2.6	1.6
Benzo(k)fluoranthene	mg/kg	7.5	1.5	1.2	11 J	0.95 J	0.50 J	0.37 J	1.0 J	0.79 J	0.50 J
Benzo(a)pyrene	mg/kg	18	3.7	2.1	25	2.4	1.2	0.97	2.0	1.9	1.2
Indeno(1,2,3-cd)pyrene	mg/kg	7.3	1.4	0.81	13	1.2	0.65	0.46	0.85	0.92	0.57
Dibenz(a,h)anthracene	mg/kg	0.86 U	0.38 U	0.22 U	3.8	0.34 J	0.21 J	0.13 J	0.28 J	0.21 J	0.15
Benzo(g,h,i)perylene	mg/kg	7.4	1.5	0.81	15	1.2	0.72	0.45	0.87	0.96	0.53
2-Methylnaphthalene	mg/kg	0.12 J	0.38 U	0.22 U	0.12 J	0.39 U	0.44 U	0.38 U	0.44 U	0.43 U	0.10 J
Total PAHs	mg/kg	220 J	41 J	21 J	300 J	26 J	13 J	13 J	26 J	24 J	16 J

Notes:

1. Samples collected by ARCADIS on the dates indicated.
2. Samples analyzed by TestAmerica located in Amherst, NY.
3. J - Indicates that the analyte was detected at a concentration less than the Reporting Limit and greater than or equal to the Method Detection Limit.
The concentration presented is estimated.
4. U - Indicates that the compound was analyzed for but not detected. The associated value is the compound quantitation limit.
5. B - Indicates that the compound was also detected in the laboratory blank sample.

Table 2
Background Sediment Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location	Probing Depth (feet)	Sediment Description
MSB - 1	0.3	Gray to brown fine to coarse SAND, some fine to coarse rounded Gravel, trace Brick.
MSB - 2	0.3	Gray to brown fine to coarse SAND, some fine to coarse rounded Gravel, trace Silt and Shells, trace Brick.
MSB - 3	0.3	Gray to brown fine to coarse SAND, little fine rounded Gravel, trace Silt, trace Brick fragments, trace Shells.
MSB - 4	0.5	Gray to brown fine SAND and ORGANICS, little Silt.
MSB - 5	0.5	Gray fine to coarse SAND, trace Shell fragments and Brick fragments, trace Silt.
MSB - 6	0.3	Gray fine to coarse SAND, trace Silt and Shell fragments, trace Organics.
MSB - 7	0.3	Brown fine to coarse SAND, trace fine to medium Gravel and Brick fragments trace Shell fragments and Silt.
MSB - 8	0.3	Gray fine to medium SAND, some Organics, trace Shells and Silt.
MSB - 9	0.5	Brown fine to coarse SAND, trace Shell fragments.
MSB - 10	0.4	Gray to brown fine to coarse SAND, trace Shell fragments and fine Gravel.
MSB - 11	0.3	Brown-gray c-mf SAND, trace fine Gravel and Shell fragments.
MSB - 12	0.3	Gray to brown fine to coarse SAND, some fine to medium Gravel, trace Shells and Zebra Mussels, trace Silt.
MSB - 13	0.3	Gray to brown fine to coarse SAND, little fine to medium Gravel, trace Silt and Shell fragments.
MSB - 14	0.3	Brown fine to coarse SAND, little fine to medium Gravel, trace Shell fragments and Brick fragments.
MSB - 15	0.3	Gray to brown fine to coarse SAND, little fine to medium Gravel, trace Brick and Glass.
MSB - 16	0.3	Gray to brown fine to coarse SAND, little fine Gravel, trace Shell and Brick fragments.
MSB - 17	0.3	Brown fine to medium SAND, little Shells and coarse Sand, trace Organics. MSB-Dup-1-8-19-10 collected here
MSB - 18	0.3	Brown fine to coarse SAND, trace fine to medium Gravel, Shells

Notes:

1. Sediment samples collected by ARCADIS on August 19, 2010 using stainless steel trowels.
2. Sediment samples were visually characterized by an ARCADIS geologist.

Table 3
Background Sediment Detailed Forensic Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	MSB-1 0 - 0.25 8/19/2010	MSB-4 0 - 0.5 8/19/2010	MSB-6 0 - 0.25 8/19/2010	MSB-7 0 - 0.333 8/19/2010	MSB-8 0 - 0.333 8/19/2010	MSB-10 0 - 0.417 8/19/2010	MSB-13 0 - 0.25 8/19/2010	MSB-18 0 - 0.25 8/19/2010	NAPL 9/28/2010
Forensic PAHs										
cis/trans-Decalin	mg/kg	0.0033 U	0.014 J	0.0087 U	0.017 U	0.024 U	0.014 U	0.015 U	0.0014 J	12.9
C1-Decalins	mg/kg	0.0028 J	0.017 J	0.0071 J	0.016 J	0.024 U	0.010 J	0.020	0.0032	36.9 U
C2-Decalins	mg/kg	0.0033 U	0.024 U	0.020	0.036	0.024 U	0.025	0.033	0.0029 U	36.9 U
C3-Decalins	mg/kg	0.0033 U	0.024 U	0.0087 U	0.017 U	0.024 U	0.014 U	0.015 U	0.0029 U	36.9 U
C4-Decalins	mg/kg	0.0033 U	0.024 U	0.0087 U	0.017 U	0.024 U	0.014 U	0.015 U	0.0029 U	36.9 U
Benzothiophene	mg/kg	0.0021 J	0.078	0.0087 U	0.017 U	0.024 U	0.014 U	0.014 J	0.0015 J	36.9 U
C1-Benzo(b)thiophenes	mg/kg	0.0072	0.089	0.013	0.021	0.024	0.015	0.042	0.0053	36.9 U
C2-Benzo(b)thiophenes	mg/kg	0.0084	0.085	0.015	0.025	0.027	0.021	0.060	0.0059	36.9 U
C3-Benzo(b)thiophenes	mg/kg	0.026 G	0.082	0.044 G	0.041 G	0.090 G	0.028 G	0.077	0.023 G	36.9 U
C4-Benzo(b)thiophenes	mg/kg	0.0088	0.054	0.015	0.022	0.030	0.024	0.050	0.0069	36.9 U
Naphthalene	mg/kg	0.061	2.6	0.094	0.087	0.094	0.067	0.25	0.051	62,800
C1-Naphthalenes	mg/kg	0.067	1.9	0.12	0.18	0.091	0.081	0.32	0.052	17,000
C2-Naphthalenes	mg/kg	0.090	1.8	0.15	0.14	0.13	0.12	0.49	0.057	36.9 U
C3-Naphthalenes	mg/kg	0.080	1.1	0.13	0.10	0.13	0.11	0.56	0.043	36.9 U
C4-Naphthalenes	mg/kg	0.046	0.48	0.10	0.071	0.084	0.065	0.39	0.034	36.9 U
Biphenyl	mg/kg	0.033	0.55	0.060	0.073	0.082	0.046	0.12	0.021	36.9 U
Dibenzofuran	mg/kg	0.17	4.0	0.25	0.41	0.38	0.35	1.3	0.017	8,470
Acenaphthylene	mg/kg	0.052	0.74	0.16	0.066	0.13	0.13	0.56	0.021	7,690
Acenaphthene	mg/kg	0.35	5.8	0.53	0.70	0.88	0.80	2.6	0.023	9,070
Fluorene	mg/kg	0.43	6.9	0.59	0.73	0.98	0.87	3.3	0.026	10,500
C1-Fluorenes	mg/kg	0.10	1.2	0.13	0.12	0.19	0.17	0.74	0.014	36.9 U
C2-Fluorenes	mg/kg	0.078	0.96	0.14	0.11	0.19	0.17	0.75	0.028	36.9 U
C3-Fluorenes	mg/kg	0.33	4.5	0.80	0.65	1.5	1.0	5.3	0.058	36.9 U
Anthracene	mg/kg	0.81	10	1.1	1.0	1.7	1.9	5.2	0.048	9,430
Phenanthrene	mg/kg	3.8	57	6.9	6.6	12	9.7	42	0.32	31,200
C1-Phenanthrenes/Anthracenes	mg/kg	0.83	11	1.5	1.0	2.1	2.0	7.9	0.11	36.9 U
C2-Phenanthrenes/Anthracenes	mg/kg	0.33	4.0	0.63	0.48	0.93	0.91	3.5	0.062	36.9 U
C3-Phenanthrenes/Anthracenes	mg/kg	0.14	1.5	0.28	0.24	0.41	0.41	1.8	0.033	36.9 U
C4-Phenanthrenes/Anthracenes	mg/kg	0.054	0.64	0.14	0.16	0.21	0.16	0.88	0.022	36.9 U
Retene	mg/kg	0.033	0.024 U	0.14	0.017 U	0.081	0.014 U	0.015 U	0.023	36.9 U
Dibenzothiophene	mg/kg	0.24	3.2	0.39	0.38	0.64	0.56	2.4	0.019	36.9 U
C1-Dibenzothiophenes	mg/kg	0.092	1.0	0.15	0.15	0.27	0.27	0.79	0.019	36.9 U
C2-Dibenzothiophenes	mg/kg	0.074	0.65	0.13	0.18	0.27	0.28	0.76	0.024	36.9 U
C3-Dibenzothiophenes	mg/kg	0.056	0.45	0.11	0.19	0.26	0.23	0.68	0.023	36.9 U
C4-Dibenzothiophenes	mg/kg	0.036	0.25	0.075	0.17	0.21	0.15	0.45	0.020	36.9 U
Benzo(b)fluorene	mg/kg	0.40	4.3	0.77	0.54	1.3	1.0	5.8	0.029	36.9 U
Fluoranthene	mg/kg	4.4	65	10	8.0	19	15	67	0.38	17,400
Pyrene	mg/kg	3.5	44	8.3	6.4	15	12	54	0.32	13,600

Table 3
Background Sediment Detailed Forensic Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	MSB-1 0 - 0.25 8/19/2010	MSB-4 0 - 0.5 8/19/2010	MSB-6 0 - 0.25 8/19/2010	MSB-7 0 - 0.333 8/19/2010	MSB-8 0 - 0.333 8/19/2010	MSB-10 0 - 0.417 8/19/2010	MSB-13 0 - 0.25 8/19/2010	MSB-18 0 - 0.25 8/19/2010	NAPL 9/28/2010
Forensic PAHs (cont'd)										
C1-Fluoranthenes/Pyrenes	mg/kg	1.3	16	2.8	1.9	4.5	3.7	15	0.12	36.9 U
C2-Fluoranthenes/Pyrenes	mg/kg	0.59	9.3	1.5	1.0	2.4	2.1	8.8	0.091	36.9 U
C3-Fluoranthenes/Pyrenes	mg/kg	0.23	3.2	0.54	0.49	0.84	0.76	3.3	0.052	36.9 U
C4-Fluoranthenes/Pyrenes	mg/kg	0.18	2.4	0.46	0.46	0.84	0.66	2.8	0.058	36.9 U
Naphthobenzothiophenes	mg/kg	0.46	6.0	1.2	0.85	2.1	1.7	6.8	0.048	36.9 U
C1-Naphthobenzothiophenes	mg/kg	0.17	1.8	0.35	0.39	0.61	0.52	2.1	0.036	36.9 U
C2-Naphthobenzothiophenes	mg/kg	0.13	1.1	0.28	0.55	0.57	0.47	1.5	0.063	36.9 U
C3-Naphthobenzothiophenes	mg/kg	0.13	0.86	0.28	0.61	0.58	0.50	1.1	0.085	36.9 U
C4-Naphthobenzothiophenes	mg/kg	0.089	0.51	0.20	0.46	0.43	0.38	0.61	0.078	36.9 U
Benzo(a)anthracene	mg/kg	1.7	26	3.7	2.6	6.1	5.6	21	0.14	7,890
Chrysene/Triphenylene	mg/kg	1.9	27	4.6	3.2	8.2	6.4	29	0.21	5,540
C1-Chrysenes	mg/kg	0.54	8.0	1.2	0.81	1.7	1.5	7.2	0.071	36.9 U
C2-Chrysenes	mg/kg	0.24	3.4	0.52	0.53	0.80	0.70	3.7	0.050	36.9 U
C3-Chrysenes	mg/kg	0.21	2.7	0.47	0.64	0.82	0.72	2.8	0.073	36.9 U
C4-Chrysenes	mg/kg	0.11	1.2	0.23	0.41	0.49	0.44	1.4	0.056	36.9 U
Benzo(b)fluoranthene	mg/kg	1.6	22	4.3	2.8	7.0	5.9	26	0.19	3,900
Benzo(k)fluoranthene	mg/kg	1.3	22	3.3	2.4	6.5	4.5	17	0.18	36.9 U
Benzo[a]fluoranthene	mg/kg	0.18	3.8	0.50	0.36	0.79	0.78	3.4	0.021	36.9 U
Benzo[e]pyrene	mg/kg	1.1	15	2.8	2.0	5.0	3.9	16	0.15	36.9 U
Benzo(a)pyrene	mg/kg	1.5	27	4.2	2.9	7.2	5.9	24	0.16	6,370
Perylene	mg/kg	0.41	6.7	1.1	0.77	1.9	1.6	6.1	0.048	36.9 U
Indeno(1,2,3-cd)pyrene	mg/kg	1.1	18	3.0	2.0	5.2	4.0	17	0.15	36.9 U
Dibenz(a,h)anthracene	mg/kg	0.29	4.6	0.73	0.42	1.2	0.93	4.5	0.033	36.9 U
Benzo(g,h,i)perylene	mg/kg	1.1	16	2.9	1.9	5.0	3.8	17	0.16	36.9 U
1-Methylnaphthalene	mg/kg	0.057	1.3	0.098	0.11	0.066	0.058	0.19	0.040	8,930
2-Methylnaphthalene	mg/kg	0.053	1.7	0.088	0.18	0.079	0.073	0.33	0.046	17,400
2,6-Dimethylnaphthalene	mg/kg	0.043	0.77	0.072	0.075	0.053	0.058	0.21	0.025	36.9 U
2,3,5-Trimethylnaphthalene	mg/kg	0.016	0.20	0.019	0.015 J	0.020 J	0.017	0.097	0.0054	36.9 U
Carbazole	mg/kg	0.37	7.7	0.90	0.70	1.7	1.3	5.5	0.035	36.9 U
4-Methyldibenzothiophene	mg/kg	0.029	0.30	0.047	0.047	0.084	0.087	0.26	0.0057	36.9 U
2/3-Methyldibenzothiophene	mg/kg	0.037	0.40	0.059	0.056	0.11	0.11	0.32	0.0060	36.9 U
1-Methyldibenzothiophene	mg/kg	0.011	0.13	0.021	0.025	0.037	0.033	0.092	0.0043	36.9 U
3-Methylphenanthrene	mg/kg	0.21	2.7	0.35	0.27	0.56	0.53	2.1	0.023	36.9 U
2/4-Methylphenanthrene	mg/kg	0.28	3.6	0.48	0.34	0.73	0.68	2.6	0.033	36.9 U
2-Methylantracene	mg/kg	0.059	0.83	0.089	0.068	0.10	0.13	0.37	0.0048	36.9 U
9-Methylphenanthrene	mg/kg	0.14	1.9	0.26	0.17	0.36	0.33	1.5	0.017	36.9 U
1-Methylphenanthrene	mg/kg	0.13	1.7	0.28	0.15	0.33	0.29	1.3	0.030	36.9 U

Table 3
Background Sediment Detailed Forensic Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:		MSB-1 0 - 0.25 8/19/2010	MSB-4 0 - 0.5 8/19/2010	MSB-6 0 - 0.25 8/19/2010	MSB-7 0 - 0.333 8/19/2010	MSB-8 0 - 0.333 8/19/2010	MSB-10 0 - 0.417 8/19/2010	MSB-13 0 - 0.25 8/19/2010	MSB-18 0 - 0.25 8/19/2010	NAPL 9/28/2010
Saturated Hydrocarbons										
2,6,10 Trimethyldodecane (1380)	mg/kg	0.00820 J	0.0530 J	0.0323 J	0.141 J	0.0774 J	0.118 J	0.122 J	0.00488 J	184 U
2,6,10 Trimethyltridecane (1470)	mg/kg	0.0535 J	0.518 J	0.151 J	0.108 J	0.138 J	0.0924 J	0.320 J	0.0295 J	184 U
Decane	mg/kg	0.0184 J	0.188 J	0.0357 J	1.74 U	2.35 U	1.40 U	0.151 J	0.0169 J	2,500 G
Dodecane	mg/kg	0.0367 J	0.190 J	0.0689 J	0.113 J	0.110 J	0.0644 J	0.661 J	0.0230 J	184 U
n-Docosane (C22)	mg/kg	0.141 J	0.779 J	0.199 J	0.243 J	0.481 J	0.224 J	0.653 J	0.0625 J	674
n-Dotriacontane (C32)	mg/kg	0.231 J	1.09 J	0.340 J	0.645 J	1.38 J	0.598 J	1.13 J	0.135 J	184 U
n-Eicosane (C20)	mg/kg	0.251 J	2.11 J	0.404 J	0.499 J	0.758 J	0.505 J	1.53 U	0.101 J	1,310
n-Heneicosane (C21)	mg/kg	0.156 J	2.41 U	0.174 J	0.386 J	0.488 J	0.381 J	1.53 U	0.0686 J	14,800 G
n-Hentriacontane (C31)	mg/kg	0.282 J	1.39 J	0.960	0.461 J	6.99	0.507 J	1.06 J	0.167 J	184 U
n-Heptacosane (C27)	mg/kg	0.174 J	0.436 J	0.342 J	0.235 J	3.29	0.217 J	0.222 J	0.0924 J	218
n-Heptadecane (C17)	mg/kg	0.176 J	0.528 J	0.230 J	0.240 J	0.293 J	0.101 J	0.211 J	0.105 J	116 J
n-Heptatriacontane (C37)	mg/kg	0.254 J	1.94 J	0.493 J	0.516 J	1.16 J	0.655 J	1.66	0.0995 J	184 U
n-Hexacosane (C26)	mg/kg	0.222 J	1.41 J	0.363 J	0.383 J	1.20 J	0.350 J	1.53 U	0.106 J	184 U
n-Hexadecane (C16)	mg/kg	0.506	7.04	0.615 J	0.822 J	1.03 J	0.846 J	3.56	0.0694 J	8,770 G
n-Hexatriacontane (C36)	mg/kg	0.131 J	0.429 J	0.186 J	0.487 J	0.622 J	0.354 J	0.285 J	0.110 J	184 U
n-Nonacosane (C29)	mg/kg	1.62	19.3	4.12	2.65	13.6	5.10	19.9	0.359	686
n-Nonadecane (C19)	mg/kg	0.160 J	0.465 J	0.123 J	0.210 J	0.277 J	0.129 J	0.297 J	0.0602 J	112 J
n-Nonatriacontane (C39)	mg/kg	0.109 J	2.41 U	0.872 U	1.74 U	0.582 J	1.40 U	1.53 U	0.106 J	184 U
n-Octacosane (C28)	mg/kg	0.141 J	0.552 J	2.42	0.329 J	1.14 J	0.230 J	0.638 J	0.0777 J	184 U
n-Octadecane (C18)	mg/kg	4.50 C	62.3 C	7.57 C	7.08 C	12.7 C	10.5 C	46.2 C	0.376 C	184 U
n-Octatriacontane (C38)	mg/kg	0.148 J	2.41 U	0.872 U	1.74 U	0.727 J	1.40 U	1.53 U	0.0978 J	184 U
Nonane	mg/kg	0.328 U	2.41 U	0.872 U	1.74 U	2.35 U	1.40 U	1.53 U	0.287 U	167 J
Norpristane (1650)	mg/kg	0.130 J	1.80 J	0.173 J	0.125 J	0.228 J	0.179 J	0.759 J	0.0384 J	184 U
n-Pentacosane (C25)	mg/kg	2.52 C	36.9 C	5.88 C	4.33 C	11.5 C	9.00 C	34.7 C	0.366 C	6,600 G
n-Pentadecane (C15)	mg/kg	0.462 G	6.53 G	0.644 JG	0.939 JG	1.08 JG	0.930 JG	3.02 G	0.0729 JG	7,850 G
n-Pentatriacontane (C35)	mg/kg	0.228 J	0.870 J	0.441 J	0.815 J	2.17 J	0.648 J	1.12 J	0.155 J	184 U
n-Tetracontane (C40)	mg/kg	0.151 J	2.41 U	0.872 U	1.74 U	0.828 J	1.40 U	1.53 U	0.120 J	184 U
n-Tetracosane (C24)	mg/kg	0.136 J	0.407 J	0.142 J	0.198 J	0.413 J	0.207 J	0.416 J	0.0611 J	184 U
n-Tetradecane (C14)	mg/kg	0.0623 J	0.241 J	0.0636 J	0.158 J	0.120 J	0.0784 J	0.456 J	0.0370 J	299
n-Tetatriacontane (C34)	mg/kg	0.232 J	0.836 J	0.392 J	0.946 J	1.69 J	0.581 J	0.661 J	0.195 J	184 U
n-Triacontane (C30)	mg/kg	0.371	2.03 J	0.616 J	0.671 J	1.87 J	0.777 J	1.65	0.148 J	369
n-Tricosane (C23)	mg/kg	0.143 J	1.56 J	0.114 J	0.191 J	0.680 J	0.120 J	1.55	0.0823 J	569
n-Tritriacontane (C33)	mg/kg	0.394	2.41 U	0.745 J	1.18 J	2.89	0.875 J	1.53 U	0.270 J	556

Table 3
Background Sediment Detailed Forensic Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID:		MSB-1	MSB-4	MSB-6	MSB-7	MSB-8	MSB-10	MSB-13	MSB-18	NAPL
Sample Depth(Feet):		0 - 0.25	0 - 0.5	0 - 0.25	0 - 0.333	0 - 0.333	0 - 0.417	0 - 0.25	0 - 0.25	
Date Collected:	Units	8/19/2010	8/19/2010	8/19/2010	8/19/2010	8/19/2010	8/19/2010	8/19/2010	8/19/2010	9/28/2010
Saturated Hydrocarbons (cont'd)										
Phytane	mg/kg	0.799	11.4	1.28	0.998 J	2.03 J	2.21	5.26	0.0886 J	24,900 G
Pristane	mg/kg	0.0594 J	0.342 J	0.137 J	0.132 J	0.110 J	0.0686 J	1.53 U	0.0330 J	184
Total Petroleum Hydrocarbons (C9-C44)	mg/kg	294	2,010	595	1,040	1,440	970	1,820	233	586,000
Total Saturated Hydrocarbons	mg/kg	15.1	164	29.6	26.5	73.0	36.8	128	4.02	71,700
Tridecane	mg/kg	0.0892 JB	0.282 J	0.0863 JB	0.151 J	0.160 J	0.0812 JB	0.609 J	0.0640 JB	601
Undecane	mg/kg	0.0256 J	0.217 J	0.0392 J	0.0887 J	0.0962 J	0.0448 J	0.583 J	0.0221 J	340

Notes:

1. Samples collected by ARCADIS on the dates indicated.
2. Samples analyzed by Alpha Analytical located in Mansfield, MA.
3. J - Indicates that the analyte was detected at a concentration less than the Reporting Limit and greater than or equal to the Method Detection Limit. The concentration presented is estimated.
4. U - Indicates that the compound was analyzed for but not detected. The associated value is the compound quantitation limit.
5. C - indicates that another compound is likely co-eluting with this n-alkane. The presence of the co-eluting compound likely biases the concentration of this n-alkane high.
6. B - Indicates that the compound was also detected in the laboratory blank sample.
7. G - Indicates probable matrix interference in PAH alkyl group quantification.

Table 4
Geotechnical Analysis Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Sample	Sieve Size - Percent Passing Sieve													
	2"	1.5"	1"	0.75"	0.5"	0.375"	0.25"	#4	#10	#30	#40	#60	#100	#200
PDI-1	100	84.9	73.9	65.1	52.8	47.8	40.8	36.5	25.7	14.7	12.3	9.5	7.7	6.1
PDI-2	100	63.8	63.8	55.8	46.6	43.3	35.9	30.3	21.2	10.4	7.2	4.4	2.9	1.5

Notes:

1. Samples collected by ARCADIS.
2. Samples analyzed by PW Labs located in Syracuse, NY.

Table 5
Delineation Sediment PAH Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	T-1-A 0 - 0.5 9/22/2010	T-1-A 0.5 - 1 9/22/2010	T-1-A 1 - 3 9/22/2010	T-1-A 3 - 5 9/22/2010	T-1-C 0 - 0.5 9/22/2010	T-1-C 0.5 - 1 9/22/2010	T-1-C 1 - 3 9/22/2010	T-1-C 3 - 5.1 9/22/2010
PAHs									
Chrysene	mg/kg	0.65	2.5	3.7	2.5	0.88	0.15	0.49 J	3.9
Naphthalene	mg/kg	0.098 U	0.64	1.4	1.1 U	0.13	0.020 U	0.11 U	0.47
Dibenzofuran	mg/kg	0.021 J	0.66	1.7	0.46 J	0.11	0.0059 J	0.028 J	0.90
Acenaphthylene	mg/kg	0.098 U	0.072 J	0.089 J	0.29 J	0.089 J	0.031	0.095 J	0.20
Acenaphthene	mg/kg	0.019 J	0.82	2.5	0.37 J	0.14	0.0055 J	0.037 J	1.3
Fluorene	mg/kg	0.037 J	0.91	2.5	1.1 U	0.18	0.0098 J	0.048 J	1.7
Anthracene	mg/kg	0.16	1.9	4.1	1.4	0.38	0.032	0.15 J	3.4
Phenanthrene	mg/kg	0.83	7.5	14	5.6	2.0	0.13	0.58 J	11
Fluoranthene	mg/kg	1.7	7.9	11	6.2	2.3	0.30	1.1 J	10
Pyrene	mg/kg	1.2	6.2	9.3	5.2	1.9	0.24	0.89 J	8.5
Benzo(a)anthracene	mg/kg	0.71	3.0	4.4	3.0	1.0	0.17	0.58 J	4.6
Benzo(b)fluoranthene	mg/kg	0.91	3.4	4.4	3.0	1.2	0.22	0.64 J	4.2
Benzo(k)fluoranthene	mg/kg	0.24	0.89	1.4	1.0 J	0.34	0.063	0.31	1.3
Benzo(a)pyrene	mg/kg	0.75	3.2	4.7	3.0	1.1	0.19	0.65 J	4.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.52	2.0	2.4	1.7	0.59	0.12	0.37 J	2.2
Dibenz(a,h)anthracene	mg/kg	0.098 U	0.11 U	0.11 U	1.1 U	0.11 U	0.020 U	0.11 UJ	0.11 U
Benzo(g,h,i)perylene	mg/kg	0.55	2.4	2.8	1.8	0.68	0.14	0.50 J	2.6
2-Methylnaphthalene	mg/kg	0.098 U	0.16	0.81	1.1 U	0.063 J	0.0043 J	0.11 U	0.31
Total PAHs	mg/kg	8.3 J	43 J	69 J	35 J	13 J	1.8 J	6.4 J	60

Table 5
Delineation Sediment PAH Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	T-2-B 0 - 0.5 9/21/2010	T-2-B 0.5 - 1 9/21/2010	T-2-B 1 - 3 9/21/2010	T-2-C 0 - 0.5 9/21/2010	T-2-C 0.5 - 1 9/21/2010	T-2-C 1 - 3 9/21/2010	T-3-B 0 - 0.5 9/20/2010	T-3-B 0.5 - 1 9/20/2010	T-3-B 1 - 3 9/20/2010	T-3-B 3 - 5.3 9/20/2010
PAHs											
Chrysene	mg/kg	0.41 H	0.83 JH	1.6 H	1.2 H	1.4 H	2.2 H	0.26	1.1	0.31	0.076
Naphthalene	mg/kg	0.037 JH	0.11 JH	0.22 H	0.061 JH	0.27 H	0.11 JH	0.091 U	0.098 U	0.099 U	0.035
Dibenzofuran	mg/kg	0.014 JH	2.0 UH	0.13 JH	0.089 JH	0.097 JH	0.36 JH	0.091 U	0.12	0.062 J	0.033
Acenaphthylene	mg/kg	0.014 JH	2.0 UH	0.33 H	0.12 JH	0.12 JH	0.54 H	0.091 U	0.18	0.099 U	0.0094 J
Acenaphthene	mg/kg	0.022 JH	0.039 JH	0.22 H	0.089 JH	0.16 JH	0.28 JH	0.091 U	0.098 U	0.099 U	0.019 U
Fluorene	mg/kg	0.031 JH	2.0 UH	0.37 H	0.25 H	0.22 H	0.83 H	0.091 U	0.21	0.093 J	0.050
Anthracene	mg/kg	0.089 JH	0.15 JH	0.78 H	0.28 H	0.47 H	1.5 H	0.077 J	0.48	0.099	0.057
Phenanthrene	mg/kg	0.39 H	0.79 JH	2.3 H	1.2 H	1.5 H	3.6 H	0.091 U	2.0	0.099 U	0.0041 J
Fluoranthene	mg/kg	0.85 H	1.7 JH	3.6 H	2.6 H	3.1 H	5.7 H	0.66	2.7	0.61	0.17
Pyrene	mg/kg	0.66 H	1.4 JH	2.9 H	2.2 H	2.5 H	4.5 H	0.47	2.3	0.53	0.16
Benzo(a)anthracene	mg/kg	0.41 H	0.76 JH	2.0 H	1.1 H	1.5 H	2.8 H	0.091 U	0.93	0.099 U	0.019 U
Benzo(b)fluoranthene	mg/kg	0.47 H	0.80 JH	1.5 H	1.3 H	1.5 H	2.4 H	0.35	1.3	0.37	0.082
Benzo(k)fluoranthene	mg/kg	0.28 H	0.52 JH	0.84 H	0.77 H	0.87 H	1.1 H	0.091 U	0.13	0.099 U	0.019 U
Benzo(a)pyrene	mg/kg	0.41 H	0.76 JH	1.5 H	1.2 H	1.4 H	2.3 H	0.30	1.3	0.35	0.067
Indeno(1,2,3-cd)pyrene	mg/kg	0.21 H	0.44 JH	0.49 H	0.52 H	0.57 H	0.73 H	0.19	0.72	0.20	0.035
Dibenz(a,h)anthracene	mg/kg	0.068 JH	2.0 UH	0.17 JH	0.16 JH	0.20 H	0.26 JH	0.091 U	0.098 U	0.099 U	0.019 U
Benzo(g,h,i)perylene	mg/kg	0.21 H	0.55 JH	0.47 H	0.54 H	0.60 H	0.68 H	0.21	0.81	0.21	0.039
2-Methylnaphthalene	mg/kg	0.011 JH	2.0 UH	0.065 JH	0.021 JH	0.042 JH	0.041 JH	0.091 U	0.060 J	0.021 J	0.013 J
Total PAHs	mg/kg	4.6 J	8.8 J	19 J	14 J	16 J	30 J	2.5 J	14 J	2.8 J	0.80 J

Table 5
Delineation Sediment PAH Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	T-3-C 0 - 0.5 9/20/2010	T-3-C 0.5 - 1 9/20/2010	T-3-C 1 - 3 9/20/2010	T-3-C 3 - 5 9/20/2010	T-3-C 5 - 5.5 9/20/2010	T-4-A 1 - 2.7 9/20/2010	T-4-B 0 - 0.5 9/17/2010	T-4-B 0.5 - 1 9/17/2010	T-4-B 1 - 3 9/17/2010	T-4-B 3 - 5 9/17/2010	T-4-B 5 - 5.7 9/17/2010
PAHs												
Chrysene	mg/kg	0.057	0.32	0.30	0.16	0.14	92	1.7	0.39 H	2.5 H	5.7 H	3.7
Naphthalene	mg/kg	0.018 U	0.097 U	0.021 U	0.11	0.34	440 D	0.22 U	0.040 JH	0.42 H	0.73 JH	1.5
Dibenzofuran	mg/kg	0.011 J	0.040 J	0.019 J	0.024	0.031	91	0.095 J	0.035 JH	0.36 JH	4.2 H	3.0
Acenaphthylene	mg/kg	0.018 U	0.097 U	0.024	0.029	0.023	71	0.22 U	0.017 JH	0.36 JH	1.6 H	0.88
Acenaphthene	mg/kg	0.018 U	0.097 U	0.021 U	0.019 U	0.020 U	95	0.15 J	0.052 JH	0.78 H	5.7 H	3.1
Fluorene	mg/kg	0.019	0.097 U	0.037	0.042	0.047	120	0.18 J	0.055 JH	0.76 H	7.5 H	4.5
Anthracene	mg/kg	0.028	0.10	0.081	0.12	0.10	130	0.46	0.16 JH	1.5 H	8.3 H	9.0
Phenanthrene	mg/kg	0.015 J	0.097 U	0.33	0.12	0.14	340 D	2.8	0.55 H	4.8 H	24 H	18 D
Fluoranthene	mg/kg	0.14	0.75	0.77	0.36	0.32	230 D	5.0	0.85 H	5.7 H	16 H	10
Pyrene	mg/kg	0.11	0.58	0.56	0.28	0.25	190 D	3.4	0.69 H	4.6 H	13 H	7.1
Benzo(a)anthracene	mg/kg	0.018 U	0.097 U	0.24	0.095	0.056	110	1.8	0.41 H	3.0 H	7.8 H	4.2
Benzo(b)fluoranthene	mg/kg	0.084	0.41	0.36	0.16	0.15	93	2.4	0.44 H	2.9 H	5.4 H	3.2
Benzo(k)fluoranthene	mg/kg	0.018 U	0.097 U	0.077	0.019 U	0.020 U	20	0.91	0.24 H	1.4 H	3.0 H	1.4
Benzo(a)pyrene	mg/kg	0.067	0.39	0.33	0.16	0.14	91	2.2	0.38 H	2.7 H	5.8 H	3.7
Indeno(1,2,3-cd)pyrene	mg/kg	0.044	0.23	0.19	0.083	0.081	48	1.5 J	0.18 JH	1.0 H	2.1 H	1.7 J
Dibenz(a,h)anthracene	mg/kg	0.018 U	0.097 U	0.021 U	0.019 U	0.020 U	0.73 U	0.22 U	0.062 JH	0.33 JH	0.65 JH	0.093 U
Benzo(g,h,i)perylene	mg/kg	0.046	0.24	0.21	0.091	0.086	45	1.7	0.19 H	1.0 H	2.1 H	1.6
2-Methylnaphthalene	mg/kg	0.0045 J	0.097 U	0.0077 J	0.017 J	0.034	140	0.22 U	0.016 JH	0.16 JH	0.15 JH	0.65
Total PAHs	mg/kg	0.61 J	3.0	3.5 J	1.8 J	1.9	2,300	24 J	4.7 J	34 J	110 J	74 J

Table 5
Delineation Sediment PAH Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	T-4-C 0.5 - 1 9/17/2010	T-4-C 1 - 3 9/17/2010	T-4-C 3 - 5 9/17/2010	T-5a-B 0.5 - 1 9/15/2010	T-5a-B 1 - 3 9/15/2010	T-5a-B 3 - 5 9/15/2010	T-5-B 0.5 - 1 9/15/2010	T-5-C 0 - 0.5 9/16/2010	T-5-C 0.5 - 1 9/16/2010	T-5-C 1 - 3 9/16/2010	T-5-C 3 - 5 9/17/2010
PAHs												
Chrysene	mg/kg	0.24 H	0.42 H	2.7 H	1.0 H	50 H	22	1.8 H	1.7 H	3.3 H	0.17 JH	4.5 H
Naphthalene	mg/kg	0.032 JH	0.059 JH	5.3 H	0.56 H	210 H	52	0.17 JH	0.17 JH	0.13 JH	0.087 JH	3.8 H
Dibenzofuran	mg/kg	0.016 JH	0.034 JH	1.7 H	0.15 JH	49 H	28	0.11 JH	0.066 JH	0.14 JH	0.016 JH	4.0 H
Acenaphthylene	mg/kg	0.037 JH	0.043 JH	1.4 H	0.066 JH	29 H	19	0.094 JH	0.24 H	0.048 JH	0.19 UH	1.1 H
Acenaphthene	mg/kg	0.020 JH	0.043 JH	1.8 H	0.25 H	70 H	24	0.15 JH	0.17 JH	0.26 JH	0.039 JH	6.2 H
Fluorene	mg/kg	0.024 JH	0.057 JH	2.8 H	0.28 H	62 H	34	0.34 H	0.17 JH	0.36 JH	0.032 JH	5.5 H
Anthracene	mg/kg	0.065 JH	0.16 JH	3.1 H	0.63 H	63 H	33	0.75 H	0.46 H	1.2 H	0.058 JH	5.7 H
Phenanthrene	mg/kg	0.24 H	0.56 H	8.7 H	1.9 H	240 H	120	2.0 H	1.4 H	3.9 H	0.20 H	22 H
Fluoranthene	mg/kg	0.45 H	0.84 H	7.3 H	2.2 H	180 H	80	2.8 H	3.7 H	5.9 H	0.27 H	13 H
Pyrene	mg/kg	0.36 H	0.66 H	5.4 H	1.7 H	140 H	59	2.3 H	3.2 H	5.8 H	0.30 H	11 H
Benzo(a)anthracene	mg/kg	0.28 H	0.47 H	3.8 H	1.1 H	65 H	30	2.0 H	1.9 H	3.0 H	0.16 JH	5.1 H
Benzo(b)fluoranthene	mg/kg	0.30 H	0.56 H	2.9 H	1.0 H	57 H	27	1.8 H	2.3 H	3.2 H	0.16 JH	5.4 H
Benzo(k)fluoranthene	mg/kg	0.17 JH	0.22 H	1.7 H	0.49 H	28 H	9.0	1.0 H	0.98 H	1.4 H	0.062 JH	0.92 UH
Benzo(a)pyrene	mg/kg	0.27 H	0.47 H	2.9 H	0.90 H	57 H	28	1.7 H	2.0 H	3.0 H	0.14 JH	4.2 H
Indeno(1,2,3-cd)pyrene	mg/kg	0.11 JH	0.16 JH	0.79 H	0.28 H	21 H	14 J	0.49 H	0.62 H	1.2 H	0.067 JH	1.6 H
Dibenz(a,h)anthracene	mg/kg	0.048 JH	0.068 JH	0.30 JH	0.10 JH	5.6 H	0.98 U	0.21 H	0.20 H	0.61 H	0.12 JH	0.95 H
Benzo(g,h,i)perylene	mg/kg	0.12 JH	0.17 JH	0.74 H	0.28 H	23 H	15	0.50 H	0.69 H	1.5 H	0.079 JH	2.0 HK
2-Methylnaphthalene	mg/kg	0.015 JH	0.026 JH	2.3 H	0.095 JH	59 H	25	0.11 JH	0.052 JH	0.079 JH	0.038 JH	3.7 H
Total PAHs	mg/kg	2.8 J	5.0 J	54 J	13 J	1,400	590 J	18 J	20 J	35 J	2.0 J	96

Table 5
Delineation Sediment PAH Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	T-6-A/PD1-02 0 - 0.5 9/23/2010	T-6-A/PD1-02 0.5 - 1 9/23/2010	T-6-A/PD1-02 1 - 3 9/23/2010	T-6-B 0 - 0.5 9/20/2010	T-6-B 0.5 - 1.2 9/20/2010	T-6-C 0 - 0.5 9/17/2010	T-6-C 0.5 - 1 9/17/2010	T-6-C 1 - 2.5 9/17/2010	T-7-A 0 - 0.5 9/23/2010	T-7-A 0.5 - 1 9/23/2010	T-7-A 1 - 3 9/23/2010
PAHs												
Chrysene	mg/kg	0.43	2.0	1.9	1.3	0.46	1.4	0.15	2.6	2.1	0.18	2.8
Naphthalene	mg/kg	0.17	3.4	2.0	0.12	0.092 U	0.10 U	0.092 U	1.5	0.17	0.098 J	0.89
Dibenzofuran	mg/kg	0.20	1.5	1.2	0.022 J	0.049 J	0.061 J	0.092 U	0.67	0.36	0.043 J	0.51
Acenaphthylene	mg/kg	0.060 J	0.46	0.33	0.096 U	0.044 J	0.036 J	0.092 U	0.42	0.36	0.045 J	0.42
Acenaphthene	mg/kg	0.099 J	7.7	4.3	0.028 J	0.092 U	0.10 U	0.092 U	1.4	0.58	0.074 J	1.4
Fluorene	mg/kg	0.093 J	7.0	3.6	0.051 J	0.092 U	0.14	0.092 U	1.6	0.63	0.041 J	1.1
Anthracene	mg/kg	0.13	3.5	2.2	0.20	0.14	0.33	0.034 J	1.7	1.2	0.076 J	2.0
Phenanthrene	mg/kg	0.66	13	8.7	0.83	0.12	1.3	0.092 U	6.1	4.8	0.26	6.9
Fluoranthene	mg/kg	1.1	9.3	6.7	2.8	1.1	3.5	0.32	5.9	6.9	0.47	7.8
Pyrene	mg/kg	0.77	6.8	5.0	2.1	0.87	2.6	0.25	4.9	5.3	0.37	6.2
Benzo(a)anthracene	mg/kg	0.50	2.0	2.2	1.1	0.065 J	1.0	0.092 U	2.8	2.7	0.25	3.3
Benzo(b)fluoranthene	mg/kg	0.63	2.2	2.3	1.4	0.59	1.7	0.20	2.7	2.7	0.26	3.5
Benzo(k)fluoranthene	mg/kg	0.18	0.84	0.79	0.46	0.092 U	0.19	0.092 U	0.83	0.84	0.096 J	1.3
Benzo(a)pyrene	mg/kg	0.59	2.1	2.1	1.2	0.59	1.5	0.17	2.4	2.8	0.25	3.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.36	1.1	1.0	0.79	0.38	0.93	0.12	1.3	1.5	0.14	2.0
Dibenz(a,h)anthracene	mg/kg	0.10 U	0.11 U	0.11 U	0.096 U	0.092 U	0.10 U	0.040 J	0.10 U	0.094 U	0.10 U	0.096 U
Benzo(g,h,i)perylene	mg/kg	0.38	1.2	1.1	0.87	0.40	1.1	0.14	1.3	1.6	0.18	2.2
2-Methylnaphthalene	mg/kg	0.022 J	0.30	0.19	0.022 J	0.027 J	0.10 U	0.092 U	0.72	0.042 J	0.025 J	0.22
Total PAHs	mg/kg	6.2 J	63	44	13 J	4.8 J	16 J	1.4 J	38	34 J	2.8 J	46

Table 5
Delineation Sediment PAH Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	T-7a-C 2.5 - 2.8 9/17/2010	T-7-B 0 - 0.7 9/16/2010	T-7-C 0 - 0.5 9/16/2010	T-7-C 0.5 - 1 9/16/2010	T-8-A 0 - 0.5 9/23/2010	T-8-A 0.5 - 1 9/23/2010	T-8-A 1 - 3 9/23/2010	T-8-A 3 - 4.1 9/23/2010	T-8-B 0 - 0.5 9/15/2010	T-8-B 0.5 - 1 9/15/2010	T-8-B 1 - 3 9/15/2010
PAHs												
Chrysene	mg/kg	110	4.3	0.93	0.54	0.90	0.44	6.5	7.2	1.2	2.9	1.8
Naphthalene	mg/kg	330	1.5	0.089 J	0.11 U	0.11 U	0.10 U	0.14 U	2.3	0.23	0.098 U	0.31
Dibenzofuran	mg/kg	130	0.60	0.032 J	0.078 J	0.066 J	0.055 J	1.0	6.5	0.24	0.37	0.16
Acenaphthylene	mg/kg	37	0.62	0.034 J	0.099 J	0.11 U	0.073 J	0.84	1.6	0.077 J	0.073 J	0.095 J
Acenaphthene	mg/kg	190	1.7	0.051 J	0.11 U	0.11 U	0.10 U	0.91	11	0.38	0.47	0.43
Fluorene	mg/kg	170	1.3	0.11 U	0.14	0.13	0.10	2.0	9.8	0.38	0.66	0.39
Anthracene	mg/kg	140	1.5	0.16	0.25	0.25	0.18	5.3	9.3	0.47	1.5	0.65
Phenanthrene	mg/kg	560 D	4.3	0.86	0.10 J	1.0 J	0.10 U	13	36	1.7	6.4	3.0
Fluoranthene	mg/kg	380 D	8.2	1.8	1.4	2.2	1.0	17	22	2.4	7.6	4.3
Pyrene	mg/kg	280	7.3	1.5	1.1	1.7 J	0.82	13	17	1.9	6.1	3.4
Benzo(a)anthracene	mg/kg	170	4.9	0.79	0.29	0.37	0.045 J	8.2	10	1.1	3.3	1.8
Benzo(b)fluoranthene	mg/kg	130	4.5	1.1	0.72	1.0	0.56	7.6	7.7	1.2	3.3	1.9
Benzo(k)fluoranthene	mg/kg	57	1.5	0.36	0.11 U	0.11 U	0.10 U	2.1	3.0	0.52	1.2	0.74
Benzo(a)pyrene	mg/kg	150	4.4	0.89	0.68	0.94	0.53	7.2	8.1	1.1	3.2	1.7
Indeno(1,2,3-cd)pyrene	mg/kg	67 J	2.6	0.66	0.36	0.57	0.31	3.3	3.2	0.74 J	1.9	0.030 J
Dibenz(a,h)anthracene	mg/kg	2.3 U	0.10 U	0.11 U	0.13	0.11 U	0.10 U	0.14 U	0.18 U	0.093 U	0.098 U	0.10 U
Benzo(g,h,i)perylene	mg/kg	63	2.8	0.70	0.34	0.57	0.32	3.3	3.0	0.82	2.1	1.1
2-Methylnaphthalene	mg/kg	170	0.44	0.023 J	0.040 J	0.11 U	0.032 J	0.14	0.22	0.27	0.24	0.093 J
Total PAHs	mg/kg	3,000 J	52	9.9 J	6.2 J	9.6 J	4.4 J	90	150	14 J	41 J	22 J

Table 5
Delineation Sediment PAH Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	T-8-C 0 - 0.5 9/15/2010	T-8-C 0.5 - 1 9/15/2010	T-8-C 1 - 2.5 9/15/2010	T-8-C 2.5 - 2.8 9/15/2010	T-9-A 0 - 0.5 9/23/2010	T-9-A 0.5 - 1 9/23/2010	T-9-A 1 - 3 9/23/2010
PAHs								
Chrysene	mg/kg	1.1	3.6 H	0.81 H	1.7	19	11	0.32
Naphthalene	mg/kg	0.082 J	0.52 JH	0.062 JH	0.37	0.35 U	1.2 U	0.034
Dibenzofuran	mg/kg	0.069 J	0.50 JH	0.058 JH	0.20	1.6	1.5	0.067
Acenaphthylene	mg/kg	0.11 U	0.19 JH	0.051 JH	0.25	2.4	1.7	0.042
Acenaphthene	mg/kg	0.15	0.92 JH	0.12 JH	0.26	0.92	1.2 U	0.13
Fluorene	mg/kg	0.13	1.0 JH	0.11 JH	0.36	3.3	2.6	0.23
Anthracene	mg/kg	0.30	2.1 H	0.20 JH	0.60	7.0	4.3	0.19
Phenanthrene	mg/kg	1.2	7.5 H	0.86 H	2.2	34	15	0.34
Fluoranthene	mg/kg	2.2	6.8 H	1.5 H	2.9	41	27	1.1
Pyrene	mg/kg	1.7	7.2 H	1.5 H	2.7	34	20	0.90
Benzo(a)anthracene	mg/kg	1.0	3.4 H	0.67 H	1.6	21	7.6	0.30
Benzo(b)fluoranthene	mg/kg	1.2	2.9 H	0.81 H	1.8	23	14	0.34
Benzo(k)fluoranthene	mg/kg	0.51	1.7 H	0.43 H	0.64	6.5	1.2 U	0.023 U
Benzo(a)pyrene	mg/kg	1.1	3.3 H	0.75 H	1.6	20	12	0.31
Indeno(1,2,3-cd)pyrene	mg/kg	0.66 J	1.4 H	0.33 H	0.98	11	6.7	0.16
Dibenz(a,h)anthracene	mg/kg	0.11 U	1.0 JH	0.20 JH	0.10 U	0.35 U	1.2 U	0.023 U
Benzo(g,h,i)perylene	mg/kg	0.77	2.0 H	0.40 H	1.1	11	7.2	0.16
2-Methylnaphthalene	mg/kg	0.033 J	0.27 JH	0.028 JH	0.15	0.80	0.55 J	0.019 J
Total PAHs	mg/kg	12 J	46 J	8.8 J	19	230	130 J	4.6 J

Table 5
Delineation Sediment PAH Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Location ID: Sample Depth(Feet): Date Collected:	Units	T-9a-A 0 - 0.5 9/20/2010	T-9a-A 0.5 - 1 9/20/2010	T-9a-A 1 - 3 9/20/2010	T-9a-A 3 - 5 9/20/2010	T-9a-A 5 - 5.7 9/20/2010	T-9a-B 0 - 0.5 9/21/2010	T-9a-B 0.5 - 1 9/21/2010	T-9a-B 1 - 3 9/21/2010	T-9a-B 3 - 5 9/21/2010	T-9a-B 5 - 5.7 9/21/2010
PAHs											
Chrysene	mg/kg	2.2	1.1	55	120	12	4.2	1.4	7.8	0.53	0.13
Naphthalene	mg/kg	0.80	0.096 U	0.76 U	4.1 U	0.80	0.47	0.097 U	1.1	0.042	0.054
Dibenzofuran	mg/kg	0.87	0.088 J	19	14	5.3	0.60	0.26	2.0	0.14	0.099
Acenaphthylene	mg/kg	0.46	0.049 J	7.0	9.9	1.4	0.36	0.12	0.62	0.029	0.015 J
Acenaphthene	mg/kg	1.1	0.096 U	26	4.1 U	6.7	1.1	0.097 U	1.9	0.091	0.12
Fluorene	mg/kg	1.3	0.16	37	25	10	1.0	0.42	2.6	0.20	0.13
Anthracene	mg/kg	1.7	0.32	77	68	14	1.8	0.77	5.2	0.40	0.13
Phenanthrene	mg/kg	5.8	1.3	170	310	41 D	7.4	3.3	18	1.5	0.51
Fluoranthene	mg/kg	5.7	3.0	140	330	35 D	10	4.2	18	1.5	0.35
Pyrene	mg/kg	4.6	2.1	120	250	29 D	8.1	3.1	14	1.1	0.29
Benzo(a)anthracene	mg/kg	2.3	0.76	73	130	13	4.6	1.4	9.9	0.64	0.14
Benzo(b)fluoranthene	mg/kg	2.2	1.4	58	120	11	4.8	1.7	9.0	0.57	0.13
Benzo(k)fluoranthene	mg/kg	0.79	0.13	18	36	3.9	1.1	0.28	2.7	0.18	0.053
Benzo(a)pyrene	mg/kg	2.2	1.3	60	120	12	4.1	1.7	8.7	0.60	0.13
Indeno(1,2,3-cd)pyrene	mg/kg	1.3	0.82	29	65	7.1	2.7	0.93	4.6	0.31	0.072
Dibenz(a,h)anthracene	mg/kg	0.099 U	0.096 U	0.76 U	4.1 U	0.11 U	0.10 U	0.097 U	0.12 U	0.019 U	0.018 U
Benzo(g,h,i)perylene	mg/kg	1.3	0.91	30	68	7.0	2.8	1.0	4.7	0.32	0.083
2-Methylnaphthalene	mg/kg	0.25	0.096 U	1.1	2.8 J	0.76	0.058 J	0.061 J	0.57	0.053	0.020
Total PAHs	mg/kg	34	13 J	900	1,700 J	200	55 J	20 J	110	8.1	2.4 J

Table 5
Delineation Sediment PAH Analytical Summary

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

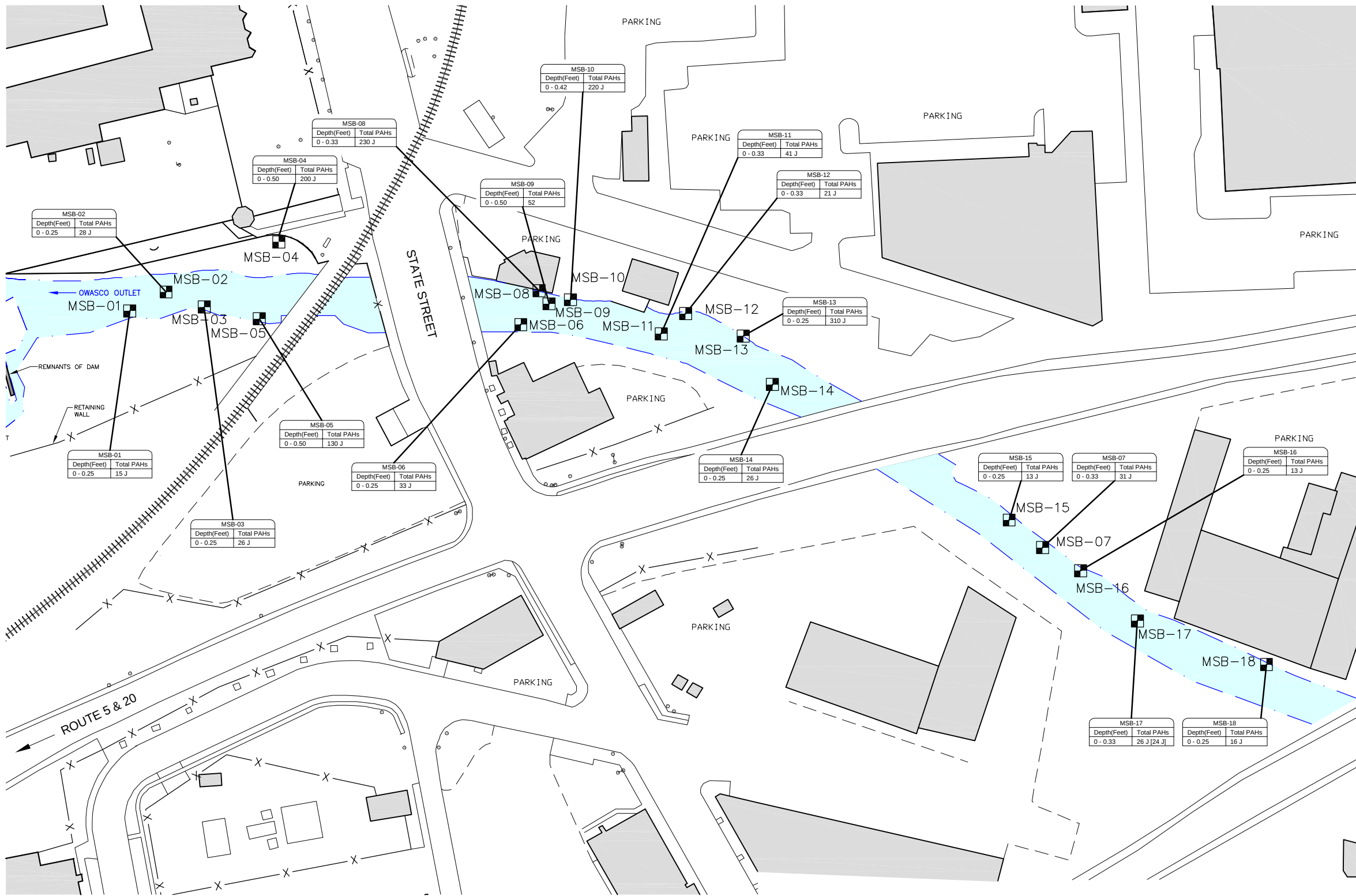
Location ID: Sample Depth(Feet): Date Collected:	Units	T-9-B 0.5 - 1 9/15/2010	T-9-B 1 - 3 9/15/2010	T-9-B 3 - 3.5 9/15/2010	T-9-C 0 - 0.5 9/15/2010	T-9-C 0.5 - 1 9/15/2010	T-9-C 1 - 2.5 9/15/2010	T-9-C 2.5 - 2.8 9/15/2010
PAHs								
Chrysene	mg/kg	1.6	1.5 JH	5.9	1.0 J	3.7 H	3.4 H	70 H
Naphthalene	mg/kg	0.19 J	0.40 JH	1.9	0.11 J	0.25 JH	0.39 JH	90 H
Dibenzofuran	mg/kg	0.098 J	0.17 JH	0.79	0.22 J	0.16 JH	0.22 JH	67 H
Acenaphthylene	mg/kg	0.16 J	0.19 JH	0.60	0.31 J	0.30 JH	0.36 JH	7.6 JH
Acenaphthene	mg/kg	0.36 J	0.72 JH	2.3	0.097 J	0.43 H	0.64 H	130 H
Fluorene	mg/kg	0.32 J	0.56 JH	2.3	0.47 J	0.73 H	0.79 H	91 H
Anthracene	mg/kg	0.47	0.68 JH	2.6	0.60 J	1.7 H	1.5 H	85 H
Phenanthrene	mg/kg	1.9	2.0 H	11	3.3 J	2.6 H	4.3 H	290 H
Fluoranthene	mg/kg	3.2	2.8 H	14	2.9 J	6.3 H	8.2 H	170 H
Pyrene	mg/kg	2.9	3.2 H	11	2.2 J	6.5 H	7.9 H	140 H
Benzo(a)anthracene	mg/kg	1.8	1.6 JH	7.0	1.3 J	3.6 H	3.8 H	78 H
Benzo(b)fluoranthene	mg/kg	1.9	1.4 JH	6.6	1.2 J	4.3 H	2.9 H	80 HK
Benzo(k)fluoranthene	mg/kg	0.75	0.63 JH	2.2	0.38 J	2.5 H	1.8 H	12 UH
Benzo(a)pyrene	mg/kg	1.5	1.5 JH	6.2	1.2 J	4.4 H	3.1 H	65 H
Indeno(1,2,3-cd)pyrene	mg/kg	0.96 J	0.51 JH	3.0	0.61 J	2.0 H	0.93 H	24 H
Dibenz(a,h)anthracene	mg/kg	0.42 U	1.1 JH	0.21 U	0.099 UJ	0.83 H	0.44 H	13 H
Benzo(g,h,i)perylene	mg/kg	1.1	0.59 JH	3.1	0.64 J	2.3 H	1.0 H	29 H
2-Methylnaphthalene	mg/kg	0.42 U	0.062 JH	0.42	0.10 J	0.12 JH	0.17 JH	100 H
Total PAHs	mg/kg	19 J	19 J	80	16 J	43 J	42 J	1,500 J

Notes:

1. Samples collected by ARCADIS on the dates indicated.
2. Samples analyzed by TestAmerica located in Amherst, NY.
3. J - Indicates that the analyte was detected at a concentration less than the Reporting Limit and greater than or equal to the Method Detection Limit. The concentration presented is estimated.
4. U - Indicates that the compound was analyzed for but not detected. The associated value is the compound quantitation limit.
5. H - Indicates that the sample was prepared or analyzed beyond the specific holding time.
6. K - Indicates that benzo(b&k)fluoranthene are unresolved due to matrix interference, result is reported as Benzo(b)fluoranthene.
7. D - Indicates that the sample required dilution due to high concentration of target analytes.

Figures

CITY: SYRACUSE, NY DIV: GROUP: ENV/CADD DB: P. LISTER, P. LISTER, W. JONES, P. M. T. W. J. B. R. I. E. N. T. R.: J. G. O. L. U. B. S. K. I. L. Y. R.: O. N. 2: OFF-REF. (FRZ)
G:\ENV\CADD\SYRACUSE\ACT\B001304900060001.dwg LAYOUT: 1. SAVED: 5/11/2011 1:03 PM ACADVER: 18.0S (LWS TECH) PAGES: 10 PAGESETUP: PLOTSTYLETABLE: PLT\Full.ctb PLOTTED: 5/11/2011 1:03 PM BY: JONES, WENDY
XREFS: 13049X01 IMAGES: PROJECTNAME: ---



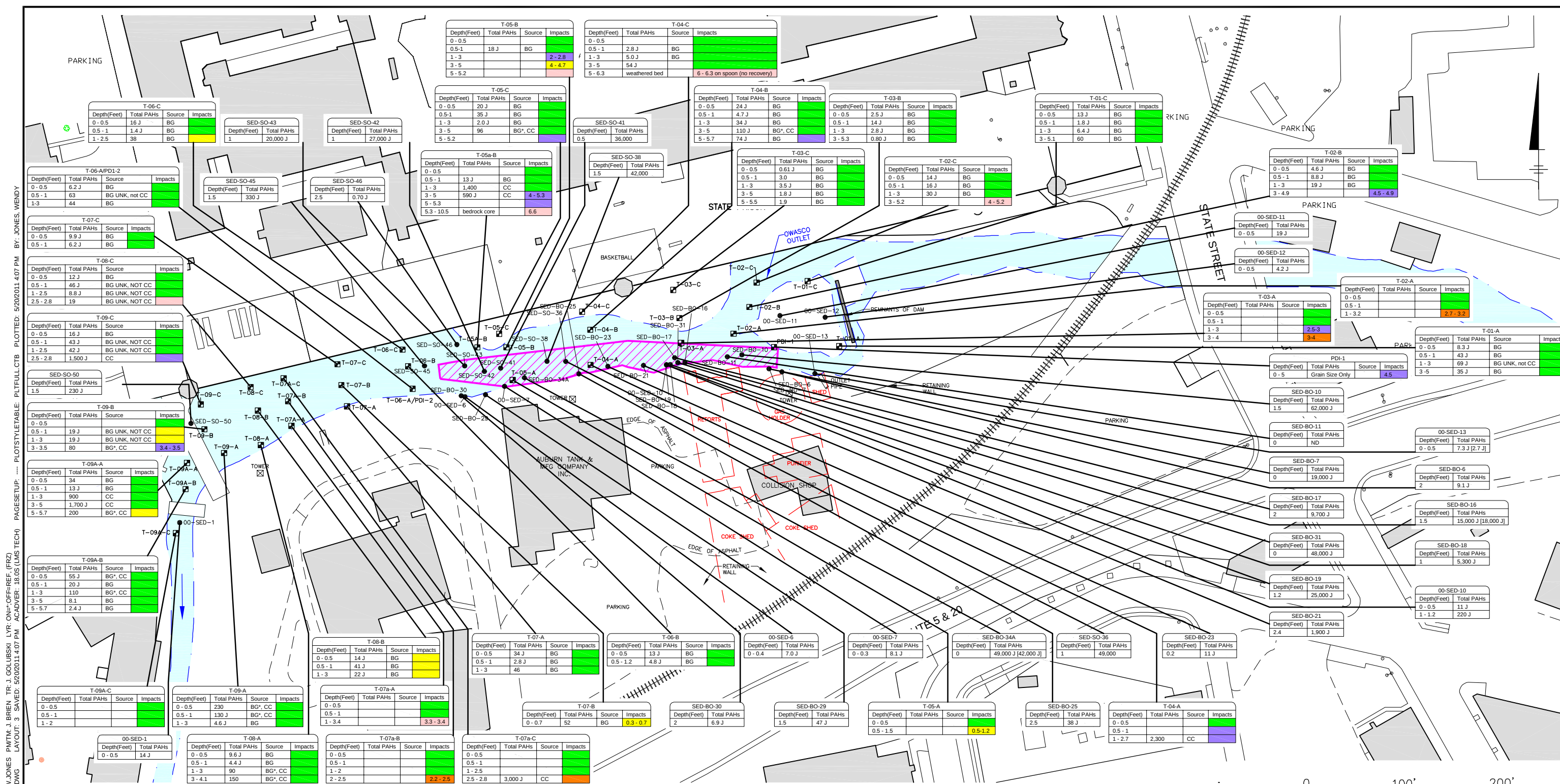
LEGEND:

- PDI SEDIMENT SAMPLING LOCATION
- - - WATER EDGE

NOTES:

1. BASE MAP PREPARED BY MERGING SITE HISTORICAL LOCATIONS FROM ELECTRONIC CADD FILE PROVIDED BY NYSEG ON 2/18/04, NAMED AUBMCMA.DWG. INTO FILE NAMED BASE_MAP.DWG, ALSO PROVIDED BY NYSEG ON 2/18/04. LAST REVISION DATE AND COORDINATE POSITIONING OF THESE FILES UNKNOWN.
2. BACKGROUND PDI SEDIMENT SAMPLING CONDUCTED BY ARCADIS IN AUGUST, 2010.
3. SEDIMENT SAMPLING LOCATIONS SURVEYED BACKGROUND PDIBY ARCADIS IN SEPTEMBER AND OCTOBER 2010. ALL OTHER LOCATIONS ARE APPROXIMATE.
4. TOTAL PAHs REPORTED AS MILLIGRAMS PER KILOGRAM (mg/kg).

0 100' 200'
GRAPHIC SCALE



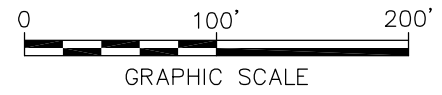
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LEGEND:

- HISTORICAL MGP STRUCTURE
- 2010 PDI SEDIMENT SAMPLING LOCATION
- 2004 SEDIMENT SAMPLING LOCATION
- WATER EDGE
- ROD REMOVAL AREA
- NO OBVIOUS IMPACTS
- MGP-LIKE ODOR
- SHEENS OR STAINING
- BLEBS
- NAPL
- NO SEDIMENT
- BG - PAH COMPOSITION SIMILAR TO BACKGROUND
- BG UNK, NOT CC - UNKNOWN PAH COMPOSITION, DIFFERENT THAN BACKGROUND, NOT MGP-RELATED
- BG*, CC - MIXTURE OF POTENTIAL COAL CARBONIZATION AND BACKGROUND PAH COMPOSITIONS
- CC - COAL CARBONIZATION PAH COMPOSITION CONSISTENT WITH McMASTER STREET NAPL

NOTES:

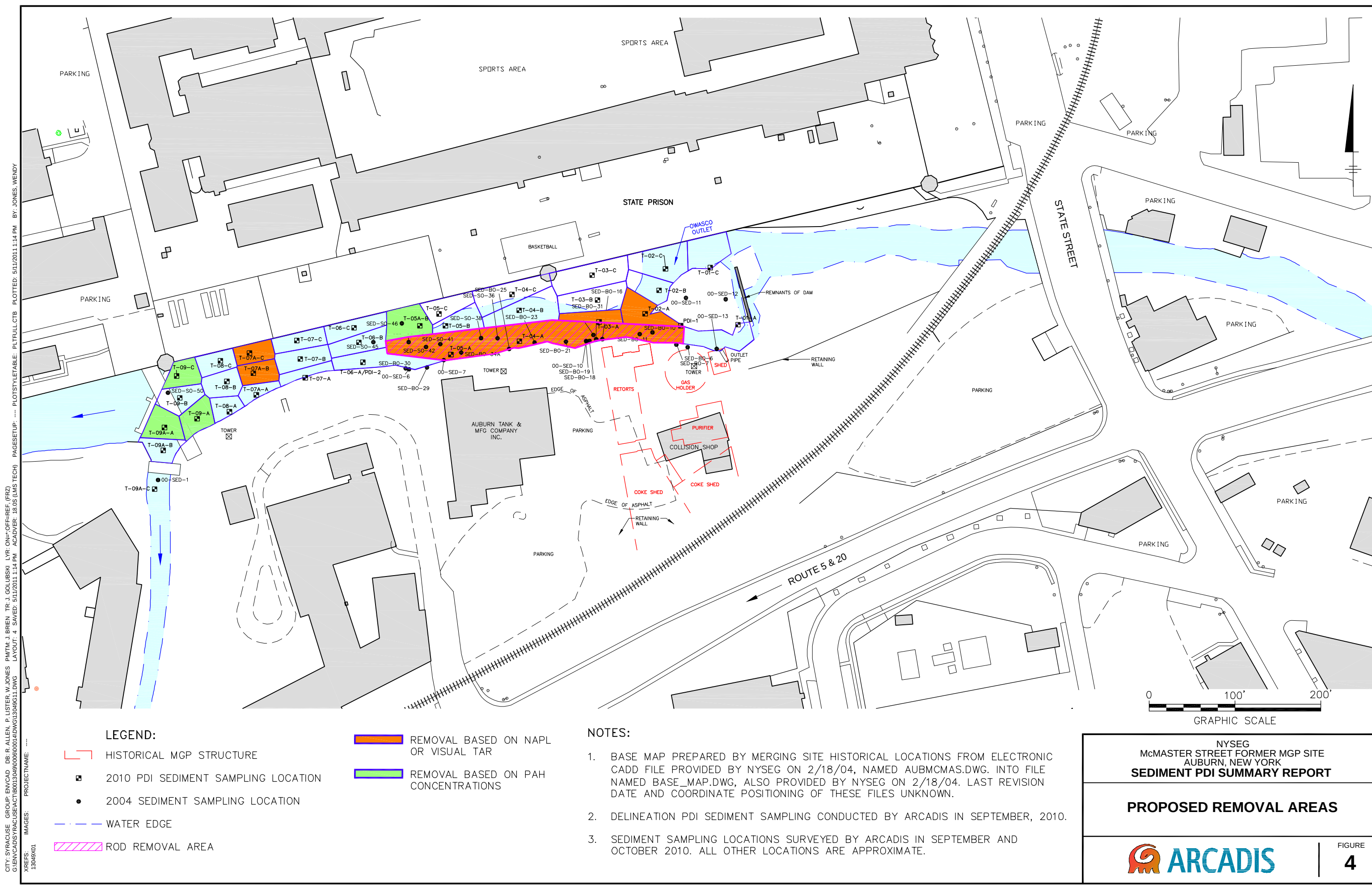
- BASE MAP PREPARED BY MERGING SITE HISTORICAL LOCATIONS FROM ELECTRONIC CADD FILE PROVIDED BY NYSEG ON 2/18/04, NAMED AUBMCMA.DWG. INTO FILE NAMED BASE_MAP.DWG, ALSO PROVIDED BY NYSEG ON 2/18/04. LAST REVISION DATE AND COORDINATE POSITIONING OF THESE FILES UNKNOWN.
- DELINEATION PDI SEDIMENT SAMPLING CONDUCTED BY ARCADIS IN SEPTEMBER, 2010.
- SEDIMENT SAMPLING LOCATIONS SURVEYED BY ARCADIS IN SEPTEMBER AND OCTOBER 2010. ALL OTHER LOCATIONS ARE APPROXIMATE.
- TOTAL PAHs REPORTED AS MILLIGRAMS PER KILOGRAM (mg/kg).



NYSEG
McMASTER STREET FORMER MGP SITE
AUBURN, NEW YORK
SEDIMENT PDI SUMMARY REPORT

**SEDIMENT PDI DELINEATION
TOTAL PAH CONCENTRATIONS**

FIGURE
3



CITY: SYRACUSE GROUP: ENVCAD DB: R ALLEN, P LISTER, W JONES PMTM: J BRIEN TR: J GOLUBSKI LVR: ON*OFF=REF (FRZ)
G:\ENVCAD\SYRACUSE\ACT\B0013049\0000000001.dwg 13049G11.DWG LAYOUT: 4 SAVED: 5/11/2011 1:14 PM ACADVER: 18.05 (LWS TECH) PAGES: 10 PLOT: 5/11/2011 1:14 PM BY: JONES, WENDY
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NYSEG
McMASTER STREET FORMER MGP SITE
AUBURN, NEW YORK
SEDIMENT PDI SUMMARY REPORT

PROPOSED REMOVAL AREAS

FIGURE
4

ARCADIS

Attachment 1

Sediment Boring Logs

Date Start/Finish: 9/21/2010	Northing: 1069032.7	Boring ID: PDI-01
Drilling Company: Parratt-Wolff	Easting: 823251.0	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: NA	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 652.7 feet AMSL	
Casing Size: NA	Borehole Depth: 5.2 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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655									
0		1	0-2	1.2	ND			Brown to gray (to black at 0.5 feet bgs) fine to medium SAND and fine to medium subangular GRAVEL, trace red Brick, Glass, and Organics, saturated, non-plastic, organic-like odor.	
650		2	2-4	0.9	ND			Black medium to coarse subangular GRAVEL, some fine to medium Sand, trace Silt, organic-like odor, Rock fragment in tip of spoon, saturated, non-plastic.	
5		3	4-5.2	0.5	ND			Weathered Rock in tip of spoon at 4.5 feet bss. One NAPL bleb in weathered rock.	
								Auger refusal at 5.2 feet. End of boring at 5.2 feet bss.	
645									
10									
640									
15									

Backfilled to sediment surface with bentonite chips



Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery;
Coordinates are based on the North American Datum of 1983, New York Central Zone.
Elevations are based on the North American Vertical Datum of 1988.

Analytical sample PDI-01 collected at (0-5') for geotechnical analysis

Date Start/Finish: 9/22/2010	Northing: 1069033.9	Boring ID: T-01-A
Drilling Company: Parratt-Wolff	Easting: 823317.8	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: NA	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 654.5 feet AMSL	
Casing Size: NA	Borehole Depth: 5.6 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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655									
0		1	0-2	1.7	ND			Brown to multicolored medium to coarse SAND and fine to medium GRAVEL, some red Brick, little coarse Gravel, trace Glass and Organics, moist (saturated at 1.2 feet bss), non-plastic.	
		2	2-4	1.2	ND			Black medium to coarse subangular GRAVEL and Silt, trace fine to medium Sand, organic-like odor, saturated, non-plastic.	
650		3	4-5.2	0.7	ND			Auger refusal at 5.6 feet. End of boring at 5.6 feet bss.	Backfilled to sediment surface with bentonite chips
5									
645									
10									
640									
15									

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Analytical sample T-1-A collected at (0-.5'), (.5-1'), (1-3'), (3-5')
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Date Start/Finish:	9/21/2010	Northing:	NA	Boring ID:	T-01-C
Drilling Company:	Parratt-Wolff	Easting:	NA	Client:	NYSEG
Driller's Name:	Joel Rauscher	Water Depth:	NA		
Drilling Method:	3.25 inch HSA	Sediment Surface Elevation:	NA	Location:	McMaster Street Former MGP Site Auburn, New York
Casing Size:	NA	Borehole Depth:	5.1 feet bss		
Rig Type:	Diedrich D90 ATV	Descriptions By:	Joshua Oliver		
Sampling Method:	Direct-Push 3" x 2' Split Spoon				

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column		
								Stratigraphic Description	Boring Construction

Depth (ft)	Soil Type	Moisture (%)	Plasticity	Notes
0 - 1	Brown SILT, some Organics, moist, non-plastic.			
1 - 2	WOOD (possible root).			
2 - 3	Gray to black fine to medium GRAVEL, some fine to medium Sand, trace Silt and Wood, moist, non-plastic.			
3 - 4	Black fine to medium SAND and fine GRAVEL, organic-like odor, saturated, non-plastic.			
4 - 5.1	Auger refusal at 5.1 feet. End of boring at 5.1 feet bss.			



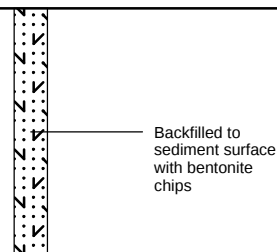
Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery;
Coordinates are based on the North American Datum of 1983, New York Central Zone.
Elevations are based on the North American Vertical Datum of 1988.

Analytical sample T-1-C collected at (0-.5'), (.5-1'), (1-3'), (3-5.1')
MS/MSD collected at (1-3'), DUP-92210 Collected at (3-5.1')

Date Start/Finish: 9/22/2010	Northing: 1069046.6	Boring ID: T-02-A
Drilling Company: Parratt-Wolff	Easting: 823209.6	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: 0.5 foot	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 651.4 feet AMSL	
Casing Size: NA	Borehole Depth: 4.3 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
-------	-----------	-------------------	-----------------	-----------------	---------------------	-------------------	-----------------	---------------------------	---------------------

0									
650	1	0-2	1.2	ND				Brown to gray fine to medium SAND and fine to medium subangular GRAVEL, some red Brick, trace Silt, Glass, and Organics, saturated, non-plastic.	
	2	2-3	0.9	ND				Gray to black fine to medium SAND and fine GRAVEL, some medium Gravel, trace red Brick and Cobbles, trace Wood at 2.6 feet bss, saturated, non-plastic, MGP-like odor, viscous black tar-like material from 2.7 to 2.9 feet bss.	
	3	3-4	0.5	ND				Brown to black fine to medium SAND and fine to medium GRAVEL, trace red Brick, saturated, non-plastic, faint MGP-like odor at 3.5 feet bss.	
5								Auger refusal at 4.3 feet. End of boring at 4.3 feet bss.	
645									
10									
640									
15									



	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Descriptions based on multiple drilling attempts. No analytical sample collected Archive samples collected at (0-.5'), (.5-1'), (1-4')
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Date Start/Finish: 9/21/2010	Northing: 1069073.8	Boring ID: T-02-B
Drilling Company: Parratt-Wolff	Easting: 823225.8	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: 0.5 foot	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 652.2 feet AMSL	
Casing Size: NA	Borehole Depth: 5.2 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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655									
0		1	0-2	1.2	ND			Brown fine to medium SAND and fine to medium GRAVEL, trace Silt, loose, red Brick, and Glass, saturated, non-plastic.	
650		2	2-3.5	0.1	ND			Gray to brown fine to medium SAND and medium GRAVEL, some fine Gravel, little Silt, saturated, non-plastic.	
		3	3.5-4.5	0.5	ND			Gray weathered ROCK, some fine to medium Sand and Silt, Rock fragment in tip of spoon, trace NAPL blebs (less than 10 blebs), sheen, saturated, non-plastic.	
5		4	4.5-5.2	0.4	ND			Auger refusal at 5.2 feet. End of boring at 5.2 feet bss.	
645									
10									
640									
15									

Backfilled to sediment surface with bentonite chips



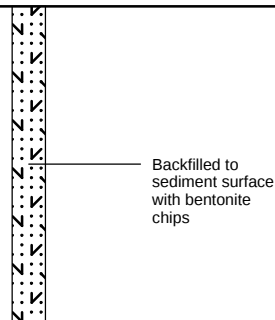
Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery;
Coordinates are based on the North American Datum of 1983, New York Central Zone.
Elevations are based on the North American Vertical Datum of 1988.

No analytical sample collected
Archive samples collected at (0-.5'), (.5-1'), (1-3'), (3-4.9')

Date Start/Finish: 9/21/2010	Northing: 1069098.8	Boring ID: T-02-C
Drilling Company: Parratt-Wolff	Easting: 823233.3	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: 2 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 652.3 feet AMSL	
Casing Size: NA	Borehole Depth: 5.5 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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655									
0		1	0-2	0.8	ND			Brown to gray fine to medium SAND and fine subangular GRAVEL, some medium Gravel, trace Silt, colored Glass and red Brick, saturated, non-plastic.	
650		2	2-4	1.0	ND			Brown to gray fine to medium SAND and fine to medium subangular GRAVEL, some Silt, trace weathered Rock, stiff, saturated, non-plastic.	
		3	4-5	0.6	ND			Increasing Silt content, trace sheen, faint MGP-like odor.	
5		4	5-5.5	0.2	ND			Weathered Rock in tip of spoon, trace sheen, faint MGP-like odor.	
								Auger refusal at 5.5 feet. End of boring at 5.5 feet bss.	
645									
10									
640									
15									

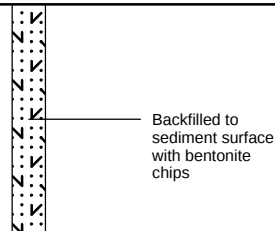


	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. No analytical sample collected Archive samples collected at (0-.5'), (.5-1'), (1-3'), (3-5'), (5-5.2')
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Date Start/Finish: 9/20/2010	Northing: 1069037.0	Boring ID: T-03-A
Drilling Company: Parratt-Wolff	Easting: 823156.0	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: 1.1 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 649.9 feet AMSL	
Casing Size: NA	Borehole Depth: 4 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
-------	-----------	-------------------	-----------------	-----------------	---------------------	-------------------	-----------------	---------------------------	---------------------

0	650								
		1	0-2	1.0	ND			Brown to gray fine to medium SAND and fine to coarse subangular to angular GRAVEL, trace Silt, red Brick, saturated, non-plastic.	
		2	2-4	1.3	ND			Gray brown fine to medium SAND and fine to medium GRAVEL, some Silt and weathered Rock, stiff, trace NAPL blebs from 2.5 to 4 feet bss (about 10 blebs in spoon), light NAPL-like coating on Rock at tip of shoe, saturated, non-plastic.	
5	645							Auger refusal at 4 feet. End of boring at 4 feet bss.	
10	640								
15	635								

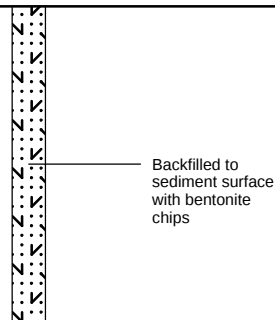


	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Descriptions based on multiple drilling attempts. No analytical sample collected Archive samples collected at (0-.5'), (.5-1'), (1-3'), (3-4')
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Date Start/Finish: 9/20/2010	Northing: 1069062.5	Boring ID: T-03-B
Drilling Company: Parratt-Wolff	Easting: 823154.2	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: 0.5 foot	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 651.7 feet AMSL	
Casing Size: NA	Borehole Depth: 5.5 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
-------	-----------	-------------------	-----------------	-----------------	---------------------	-------------------	-----------------	---------------------------	---------------------

0									
650		1	0-2	1.1	ND			Brown fine to medium SAND and fine to coarse GRAVEL, trace Silt, red Brick, and Glass (no glass from 2 feet bss), saturated, non-plastic.	
		2	2-4	0.5	ND				
5		3	4-5	0.3	ND			Gray brown fine to medium SAND and fine to medium GRAVEL, some Silt, stiff, saturated, non-plastic.	
		4	5-5.5	0.1	ND			Weathered Rock in tip of spoon. Auger refusal at 5.5 feet. End of boring at 5.5 feet bss.	
645									
10									
640									
15									

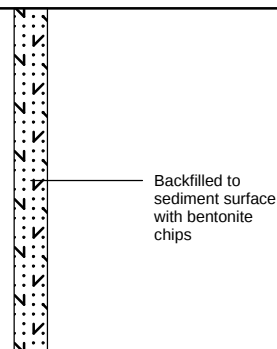


	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Descriptions based on multiple drilling attempts. Analytical sample T-3-B collected at (0-5'), (.5-1'), (1-3')
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Date Start/Finish: 9/20/2010	Northing: 1069091.4	Boring ID: T-03-C
Drilling Company: Parratt-Wolff	Easting: 823147.8	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: 1 foot	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 651.8 feet AMSL	
Casing Size: NA	Borehole Depth: 6 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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0									
650		1	0-2	1.5	ND			Brown fine to medium SAND and fine to coarse GRAVEL, trace Silt, red Brick, and Organics, saturated, non-plastic.	
		2	2-4	1.0	ND			Brown fine to medium SAND and fine to coarse GRAVEL, some Silt, red Brick, and Organics, loose, saturated, non-plastic.	
5		3	4-5	0.7	ND			Brown to gray fine to medium SAND and fine to medium GRAVEL, some Silt, stiff, saturated, non-plastic.	
		4	5-5.5	0.3	ND			Gray to brown weathered BEDROCK, some fine to medium Sand, trace Silt, stiff, Cobble in tip of spoon, saturated, non-plastic.	
645								Auger refusal at 6 feet. End of boring at 6 feet bss.	
10									
640									
15									

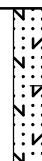


	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Analytical sample T-3-C collected at (0-.5') Archive samples collected at (.5-1'), (1-3'), (3-5'), (5-5.5')
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Date Start/Finish: 9/20/2010	Northing: 1069014.6	Boring ID: T-04-A
Drilling Company: Parratt-Wolff	Easting: 823063.1	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 1.2 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 649.6 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 2.7 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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650											
0		1	0-2	1.5	35 50 60 31	110	7.2			Gray to brown fine to coarse GRAVEL and fine to coarse SAND, trace Silt, red Brick, and Cobbles, saturated, non-plastic.	
										Weathered subangular ROCK and fine to coarse SAND and GRAVEL, little to trace Slag and red Brick, saturated, non-plastic, trace to moderate NAPL blebs from 0.7 to 1.5 feet bss, moderate MGP-like odor, trace sheen.	
		2	2-4	0.4	65 150/2	NA	16.2			Gray to black fine to coarse SAND, little fine to medium subangular Gravel, trace Weathered Rock, Silt, and Clay, till-like, moderate to strong MGP-like odor (increases with depth), trace NAPL blebs (about 5 to 10 blebs) and staining, moderate sheen.	
										Auger refusal at 2.7 feet bss. End of boring at 2.7 feet bss.	
645											
5											
640											
10											
635											
15											



Backfilled to sediment surface with bentonite chips

 ARCADIS <i>Infrastructure, environment, buildings</i>	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Analytical sample T-04-A collected at (0-.5') Archive samples collected at (.5-1'), (1-2.7')/DUP-92010 at (1-2.7')
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Date Start/Finish: 9/16 - 9/17/2010	Northing: 1069050.6	Boring ID: T-04-B
Drilling Company: Parratt-Wolff	Easting: 823062.7	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: NA	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 650.9 feet AMSL	
Casing Size: NA	Borehole Depth: 6.5 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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0									
650		1	0-2	1.7	ND			Brown fine to medium SAND and fine subangular GRAVEL, some Organics, little red Brick, trace Glass and Silt, saturated, non-plastic.	
		2	2-3	0.3	ND				
		3	3-4.5	0.7	ND			Gray to black fine to medium GRAVEL, some fine to medium Sand, trace Silt, saturated, non-plastic.	
		4	4.5-5	0.5	ND			Gray to black fine to coarse GRAVEL and fine to medium SAND, some Silt, stiff, saturated, non-plastic.	
5		5	5-5.5	0.5	0.9			Dark gray black weathered BEDROCK, some fine to medium angular Gravel, little fine to medium Sand, trace Silt, trace NAPL blebs, trace sheen in spoon, very faint MGP-like odor, saturated, non-plastic. (spoon refusal at 5.5 feet bss).	
645		6	5.5 6.5	0.1	0.1			Augered to 6.5 feet bss.	
								Auger refusal at 6.5 feet. End of boring at 6.5 feet bss.	
10									
640									
15									
635									

Backfilled to sediment surface with bentonite chips



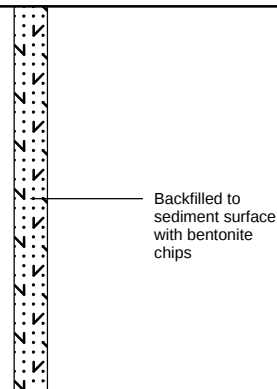
Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery;
Coordinates are based on the North American Datum of 1983, New York Central Zone.
Elevations are based on the North American Vertical Datum of 1988.
Descriptions based on multiple drilling attempts.

Analytical sample T-4-B collected at (0-5'), (5-5.7')
Archive samples collected at (.5-1'), (1-3'), (3-5')

Date Start/Finish: 9/17/2010	Northing: 1069069.0	Boring ID: T-04-C
Drilling Company: Parratt-Wolff	Easting: 823054.4	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: NA	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 652.4 feet AMSL	
Casing Size: NA	Borehole Depth: 6.7 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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655									
0		1	0-2	1.5	ND			Brown to gray fine to medium SAND, some Silt and fine to medium subangular Gravel, trace red Brick, Glass, Plastic, and Organics, red Brick in tip of spoon, saturated, non-plastic.	
650		2	2-4	0.9	ND			Red Brick at 2.5-2.6 feet bss.	
5		3	4-6	0.9	ND			Brown to gray fine to medium SAND and medium to fine GRAVEL, little Silt, stiff, saturated, non-plastic.	
		4	6-6.7	NR	NA			No recovery, sheen in spoon.	
645								Auger refusal at 6.7 feet. End of boring at 6.7 feet bss.	
10									
640									
15									



Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery;
Coordinates are based on the North American Datum of 1983, New York Central Zone.
Elevations are based on the North American Vertical Datum of 1988.
Descriptions based on multiple drilling attempts.

Analytical sample T-4-C collected at (0-.5')
Archive samples collected at (.5-1'), (1-3'), (3-5')

Date Start/Finish: 9/20/2010	Northing: 1068999.0	Boring ID: T-05-A
Drilling Company: Parratt-Wolff	Easting: 822983.3	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 2.5 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 648.3 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 1.2 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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650											
0		1	0-2	0.7	100/4	NA	1.6			Gray to brown fine to coarse subangular GRAVEL and fine to coarse SAND, trace red Brick, saturated, non-plastic. Black to gray fine to coarse GRAVEL and Weathered ROCK, little fine to coarse Sand, faint MGP-like odor (increases with depth). End of boring at 1.2 feet bss.	Backfilled to sediment surface with bentonite chips
645											
5											
640											
10											
635											
15											

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Analytical sample T-05-A collected at (.5-1.2') Archive sample collected at (0-.5')
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Date Start/Finish: 9/15/2010	Northing: 1069032.6	Boring ID: T-05-B
Drilling Company: Parratt-Wolff	Easting: 822976.9	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: NA	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 650.2 feet AMSL	
Casing Size: NA	Borehole Depth: 5.2 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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0	650	1	0-2	1.6	ND			Brown (to black at 1 foot bss) fine to medium SAND and fine to medium subangular GRAVEL, trace Silt, Organics, red Brick, and Glass, saturated, non-plastic.	
		2	2-4	0.8	ND			Black fine to medium SAND and fine to medium subangular GRAVEL, trace red Brick and Silt, saturated, non-plastic, sheen and trace NAPL blebs, faint MGP-like odor.	
		3	4-5	0.7	ND			Black to gray, fine SAND, some Clayey Silt and fine to medium subangular to angular Gravel, stiff, saturated, non-plastic, faint MGP-like odor.	
5	645	4	5-6	0.2	ND			Slight sheen from 5 to 5.2 feet bss. Auger refusal at 5.2 feet. End of boring at 5.2 feet bss.	Backfilled to sediment surface with bentonite chips
10	640								
15	635								

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Analytical sample T-05-B collected at (0-5'), (1-3') Archive samples collected at (.5-1'), (3-5'), (5-5.2')
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Date Start/Finish: 9/15/2010	Northing: 1069032.6	Boring ID: T-05-B
Drilling Company: Parratt-Wolff	Easting: 822976.9	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: NA	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 650.2 feet AMSL	
Casing Size: NA	Borehole Depth: 5.2 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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0	650	1	0-2	1.6	ND			Brown (to black at 1 foot bss) fine to medium SAND and fine to medium subangular GRAVEL, trace Silt, Organics, red Brick, and Glass, saturated, non-plastic.	
		2	2-4	0.8	ND			Black fine to medium SAND and fine to medium subangular GRAVEL, trace red Brick and Silt, saturated, non-plastic, sheen and trace NAPL blebs, faint MGP-like odor.	
		3	4-5	0.7	ND			Black to gray, fine SAND, some Clayey Silt and fine to medium subangular to angular Gravel, stiff, saturated, non-plastic, faint MGP-like odor.	
5	645	4	5-6	0.2	ND			Slight sheen from 5 to 5.2 feet bss. Auger refusal at 5.2 feet. End of boring at 5.2 feet bss.	Backfilled to sediment surface with bentonite chips
10	640								
15	635								

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Analytical sample T-05-B collected at (0-5'), (1-3') Archive samples collected at (.5-1'), (3-5'), (5-5.2')
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Date Start/Finish:	9/15/2010	Northing:	1069032.5	Boring ID:	T-5a-B
Drilling Company:	Parratt-Wolff	Easting:	822947.1	Client:	NYSEG
Driller's Name:	Joel Rauscher	Water Depth:	NA	Location:	McMaster Street Former MGP Site Auburn, New York
Drilling Method:	3.25 inch HSA	Sediment Surface Elevation:	650.6 feet AMSL		
Casing Size:	NX Core Barrel	Borehole Depth:	10.5 feet bss		
Rig Type:	Diedrich D90 ATV	Descriptions By:	Joshua Oliver		
Sampling Method:	Direct-Push 3" x 2' Split Spoon				

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
0	650	1	0-2	0.8	0.0			Brown to gray fine to medium SAND and fine to medium subangular GRAVEL, trace Silt, Organics, and red Brick, saturated, non-plastic	
		2	2-4	0.4	0.0				
5		3	4-5	0.5	8.9			Gray fine to medium SAND and CLAY, some fine to medium subangular GRAVEL, trace Silt, stiff, trace NAPL blebs throughout spoon, faint MGP-like odor, slight sheen, saturated, non-plastic, till-like material One bleb of NAPL, faint MGP-like odor. (5-5.3')	
	645	4	5-6	0.3	2.1			Spoon Refusal 5.3 feet bss; used rollerbit to 5.5 feet bss; began rock coring at 5.5 feet bss Dark gray to black (N2.5) BEDROCK.	
		5	5.5-10	4.0	ND			NAPL staining at 6.6 feet bss.	
10									
	640							End of boring at 10.5 feet bss.	
15									
	635								



Remarks: bss = below ground surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; HZ = Horizontal Fracture; VF = Vertical Fracture.
Coordinates are based on the North American Datum of 1983, New York Central Zone.
Elevations are based on the North American Vertical Datum of 1988.

Analytical sample T-5a-B collected at (3-5')
Archive samples collected at (0-.5'), (.5-1'), (1-3'), (5-5.3')

Date Start/Finish: 9/23/2010	Northing: 1068983.1	Boring ID: T-6-A/PDI-02
Drilling Company: Parratt-Wolff	Easting: 822935.9	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: 2 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 649.8 feet AMSL	
Casing Size: NA	Borehole Depth: 3.3 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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0	650								
		1	0-2	1.0	ND			Brown fine to coarse SAND and fine to medium GRAVEL, trace Silt, red Brick, Glass, and Organics, saturated, non-plastic.	
								Black fine to medium SAND and fine GRAVEL, trace Silt.	
		2	2-3	0.6	ND			Weathered Rock in tip of spoon.	
								Auger refusal at 3.3 feet. End of boring at 3.3 feet bss.	
5	645								
10	640								
15	635								

Backfilled to sediment surface with bentonite chips

 ARCADIS Infrastructure, environment, buildings	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Analytical sample T-6-A/PDI-02 collected at (0-.5'), (.5-1'), (1-3')
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Date Start/Finish: 9/20/2010	Northing: 1069013.1	Boring ID: T-06-B
Drilling Company: Parratt-Wolff	Easting: 822876.1	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 3.2 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 647.8 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 1.2 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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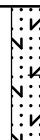
650											
0											
	1	0-2	1.0	17 23 100/.2	44	ND				Gray to brown fine to medium subangular GRAVEL and unsorted fine to coarse SAND, trace red Brick and Glass, Silt, saturated, non-plastic.	
										Spoon refusal @ 1.2 feet bss. End of boring at 1.2 feet bss.	Backfilled to sediment surface with bentonite chips
645											
5											
640											
10											
635											
15											

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. 3 Attempts Analytical sample T-06-B collected at (0-.5') Archive sample collected at (.5-1.2')
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Date Start/Finish: 9/17/2010	Northing: 1069030.2	Boring ID: T-06-C
Drilling Company: Parratt-Wolff	Easting: 822870.4	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 1.8 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 648.8 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 2.4 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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650											
0		1	0-2	1.0	25 25 19 8	44	ND			Brown fine to medium GRAVEL and fine to coarse SAND, little Cobble and red Brick, trace Silt, saturated, non-plastic.	
										Gray SILT and SAND, little fine to medium Gravel, trace Organics and Wood, saturated, non-plastic, faint to moderate MGP-like odor.	
		2	2-4	0.4	100/4	NA	ND			Spoon refusal at 2.4 feet bss. End of boring at 2.4 feet bss.	
645											
5											
640											
10											
635											
15											



Backfilled to sediment surface with bentonite chips

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. 2 Attempts Analytical sample T-06-C collected at (1-2.5') Archive samples collected at (0-.5'), (.5-1')
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Date Start/Finish: 9/23/2010	Northing: 1068972.0	Boring ID: T-7-A
Drilling Company: Parratt-Wolff	Easting: 822813.7	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: 1.5 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 649.4 feet AMSL	
Casing Size: NA	Borehole Depth: 3.4 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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650									
0		1	0-2	1.4	ND			Brown to multicolored fine to coarse SAND and fine to medium GRAVEL, trace Silt (increasing silt content with depth), red Brick, Glass, and Organics, loose, saturated, non-plastic.	
		2	2-3	0.7	ND			Weathered Rock in tip of spoon.	Backfilled to sediment surface with bentonite chips
								Auger refusal at 3.4 feet. End of boring at 3.4 feet bss.	
645									
5									
640									
10									
635									
15									

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Descriptions based on multiple drilling attempts. Analytical sample T-7-A collected at (0-5'), (.5-1'), (1-3')
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Date Start/Finish: 9/16/2010	Northing: 1068993.9	Boring ID: T-07-B
Drilling Company: Parratt-Wolff	Easting: 822807.8	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 2.43 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 648.4 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 0.7 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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650											
0											
	1	0-2	0.7	37 12 114/2	NA	ND				Gray to black fine to coarse SAND and fine to medium GRAVEL, little Silt, trace Clay (increasing with depth), trace Organics and red Brick, saturated, non-plastic, faint MGP-like odor from 0.3 to 0.7 feet bss. Spoon refusal at 0.7 feet bss. End of boring at 0.7 feet bss.	Backfilled to sediment surface with bentonite chips
645											
5											
640											
10											
635											
15											

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. 2 Attempts Analytical sample T-07-B collected at (0-0.7')
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Date Start/Finish: 9/16/2010	Northing: 1069015.3	Boring ID: T-07-C
Drilling Company: Parratt-Wolff	Easting: 822803.9	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 2.7 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 648.5 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 1 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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650											
0		1	0-2	1.0	85 16 100/5	NA	ND			Fine to coarse GRAVEL and fine to medium SAND, little Silt, trace Clay, Cobbles, red Brick, and Cinders, saturated, non-plastic.	
										Spoon refusal at 1.0 foot bss. End of boring at 1.0 feet bss.	Backfilled to sediment surface with bentonite chips
645											
5											
640											
10											
635											
15											

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. 4 Attempts Analytical sample T-07-C collected at (0-.5') Archive sample collected at (.5-1')
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Date Start/Finish: 9/23/2010	Northing: 1068952.0	Boring ID: T-7a-A
Drilling Company: Parratt-Wolff	Easting: 822756.6	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: 0.3 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 649.8 feet AMSL	
Casing Size: NA	Borehole Depth: 4 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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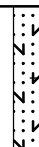
0	650								
		1	0-2	1.4	ND			Brown to multicolored fine to coarse SAND and fine GRAVEL, trace Silt, red Brick, Glass, and Organics, loose, saturated, non-plastic.	
		2	2-4	1.1	ND			Gray to brown fine to coarse SAND and fine to medium GRAVEL, trace Silt, Glass, and Organics, saturated, non-plastic.	
								Brown to gray fine to medium SAND and fine subangular GRAVEL, little Silt, stiff, saturated, non-plastic [TILL], weathered Rock, sheen, and faint MGP-like odor in tip of spoon.	
5	645							Auger refusal at 4 feet. End of boring at 4 feet bss.	
10	640								
15	635								

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Archive samples collected at (0-.5'), (.5-1'), (1-3'), (3-3.5')
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Date Start/Finish: 9/17/2010	Northing: 1069000.8	Boring ID: T-7a-B
Drilling Company: Parratt-Wolff	Easting: 822748.6	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 1.7 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 648.7 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 2.5 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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650											
0		1	0-2	2.0	27 25 14 11	39	ND			Gray to brown fine to medium SAND and fine to medium subangular GRAVEL, trace Silt, trace red Brick, Cinders, and Ash, saturated, non-plastic.	
										Gray to dark gray SILT and fine SAND, little Clay, fine to coarse Gravel, saturated, non-plastic, moderate NAPL throughout from 2.3 to 2.5 feet bss (very tacky), moderate MGP-like odor, Rock Fragments in tip of spoon.	
		2	2-4	0.5	210/5	NA	23.9			Spoon refusal at 2.5 feet bss. End of boring at 2.5 feet bss.	
645											
5											
640											
10											
635											
15											



Backfilled to
sediment surface
with bentonite
chips

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. 2 Attempts Analytical sample T-7a-B collected at (0-.5'), (2-2.5') Archive samples collected at (.5-1'), (1-2')
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Date Start/Finish: 9/17/2010	Northing: 1069000.8	Boring ID: T-7a-C
Drilling Company: Parratt-Wolff	Easting: 822748.6	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 2.2 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 648.7 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 2.8 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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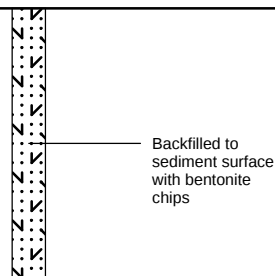
650											
0		1	0-2	0.8	17 15 20 7	25	ND			Gray to brown fine to medium GRAVEL and fine to medium SAND, little Organics and Silt, trace fire Brick and red Brick, saturated, non-plastic.	
		2	2-4	0.5	41 101/3	NA	4.4			Gray to black SILT and fine SAND, trace Clay and fine to medium Gravel, saturated, non-plastic, moderate to heavy viscous Tar-like material, Rock Fragments in tip of spoon.	Backfilled to sediment surface with bentonite chips
645										Spoon refusal at 2.8 feet bss. End of boring at 2.8 feet bss.	
5											
640											
10											
635											
15											

 ARCADIS <i>Infrastructure, environment, buildings</i>	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. 5 Attempts Analytical sample T-7a-C collected at (0-.5'), (2.5-2.8') Archive samples collected at (.5-1'), (1-2.5')
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Date Start/Finish: 9/23/2010	Northing: 1068932.4	Boring ID: T-08-A
Drilling Company: Parratt-Wolff	Easting: 822725.3	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: 1 foot	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 650.2 feet AMSL	
Casing Size: NA	Borehole Depth: 4.7 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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0	650	1	0-2	1.4	ND			Brown fine to medium SAND and fine subangular GRAVEL, little red Brick, trace Organics, Glass, and Wood, saturated, non-plastic.	
								Gray to black fine to medium SAND and medium GRAVEL, little Coal fragments and Wood pieces, Cobble in tip of spoon, saturated, non-plastic.	
		2	2-4	1.1	ND			Gray to brown fine to medium SAND and medium to coarse subangular to angular GRAVEL, some Silt, trace fine Gravel, stiff, saturated, non-plastic. [TILL]	
		3	4-4.7	0.1	ND			Gray to black Weathered BEDROCK.	
5	645							Auger refusal at 4.7 feet. End of boring at 4.7 feet bss.	
10	640								
15	635								



	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Analytical sample T-8-A collected at (0-.5'), (.5-1'), (1-3'), (3-4.1') MS/MSD at (.5-1), DUP-92310 at (0-.5')
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Date Start/Finish:	9/15/2010	Northing:	1068967.5	Boring ID:	T-08-B
Drilling Company:	Parratt-Wolff	Easting:	822718.5	Client:	NYSEG
Driller's Name:	Doug Richmond	Water Depth:	1.3 feet		
Drilling Method:	140 lb. Hammer	Sediment Surface Elevation:	649.0 feet AMSL	Location:	McMaster Street Former MGP Site Auburn, New York
Casing Size:	4 inch	Borehole Depth:	3.0 feet bss		
Rig Type:	Barge Mounted Tripod	Descriptions By:	Marcus Eriksson		
Sampling Method:	3 inch x 2 feet Split Spoon				

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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[illegible]

Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery;
Coordinates are based on the North American Datum of 1983, New York Central Zone.
Elevations are based on the North American Vertical Datum of 1988.
2 Attempts
Analytical sample T-08-B collected at (0-.5'), (1-3')
Archive sample collected at (.5-1')

Date Start/Finish: 9/15/2010	Northing: 1068991.9	Boring ID: T-08-C
Drilling Company: Parratt-Wolff	Easting: 822714.8	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 0.92 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 649.4 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 2.8 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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650											
0		1	0-2	1.0	14 14 14 10	28	ND			Gray to dark brown fine to coarse GRAVEL and fine to medium Sand, little Silt, trace Organics and red Brick, saturated, non-plastic.	
		2	2-4	0.8	14 105/3	NA	ND			Black fine to medium SAND, some fine Gravel, little Cinders and Ash, trace red Brick, saturated, non-plastic, trace sheen.	
										Spoon refusal at 2.8 feet bss. End of boring at 2.8 feet bss.	Backfilled to sediment surface with bentonite chips
645											
5											
640											
10											
635											
15											

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Analytical sample T-08-C collected at (0-.5'), (2.5-2.8') Archive samples collected at (.5-1'), (1-2.5')
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Date Start/Finish: 9/23/2010	Northing: 1068924.2	Boring ID: T-09-A
Drilling Company: Parratt-Wolff	Easting: 822687.6	Client: NYSEG
Driller's Name: Joel Rauscher	Water Depth: 0.7 foot	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 3.25 inch HSA	Sediment Surface Elevation: 650.7 feet AMSL	
Casing Size: NA	Borehole Depth: 4.1 feet bss	
Rig Type: Diedrich D90 ATV	Descriptions By: Joshua Oliver	
Sampling Method: Direct-Push 3" x 2' Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Boring Construction
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0									
650		1	0-2	1.5	ND			Brown to black fine to medium SAND and fine subangular GRAVEL, little Silt, trace red Brick and Glass, saturated, non-plastic.	
								Black to gray fine to medium GRAVEL, some fine to medium Sand, little Silt, trace Wood, saturated, non-plastic.	
		2	2-4.1	0.8	ND			Gray to brown fine to medium SAND and medium subangular GRAVEL, little Silt, trace fine to coarse Gravel, stiff, saturated, non-plastic.	
								Auger refusal at 4.1 feet. End of boring at 4.1 feet bss.	Backfilled to sediment surface with bentonite chips
5									
645									
10									
640									
15									
635									

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Descriptions based on multiple drilling attempts. 2 Attempts Analytical sample T-9-A collected at (0-0.5'), (0.5-1'), (1-3.8')
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Date Start/Finish: 9/15/2010	Northing: 1068946.4	Boring ID: T-09-B
Drilling Company: Parratt-Wolff	Easting: 822668.5	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 1.2 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 649.5 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 3.5 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: David Cornell	
Sampling Method: 3 inch x 2 feet Split Spoon		

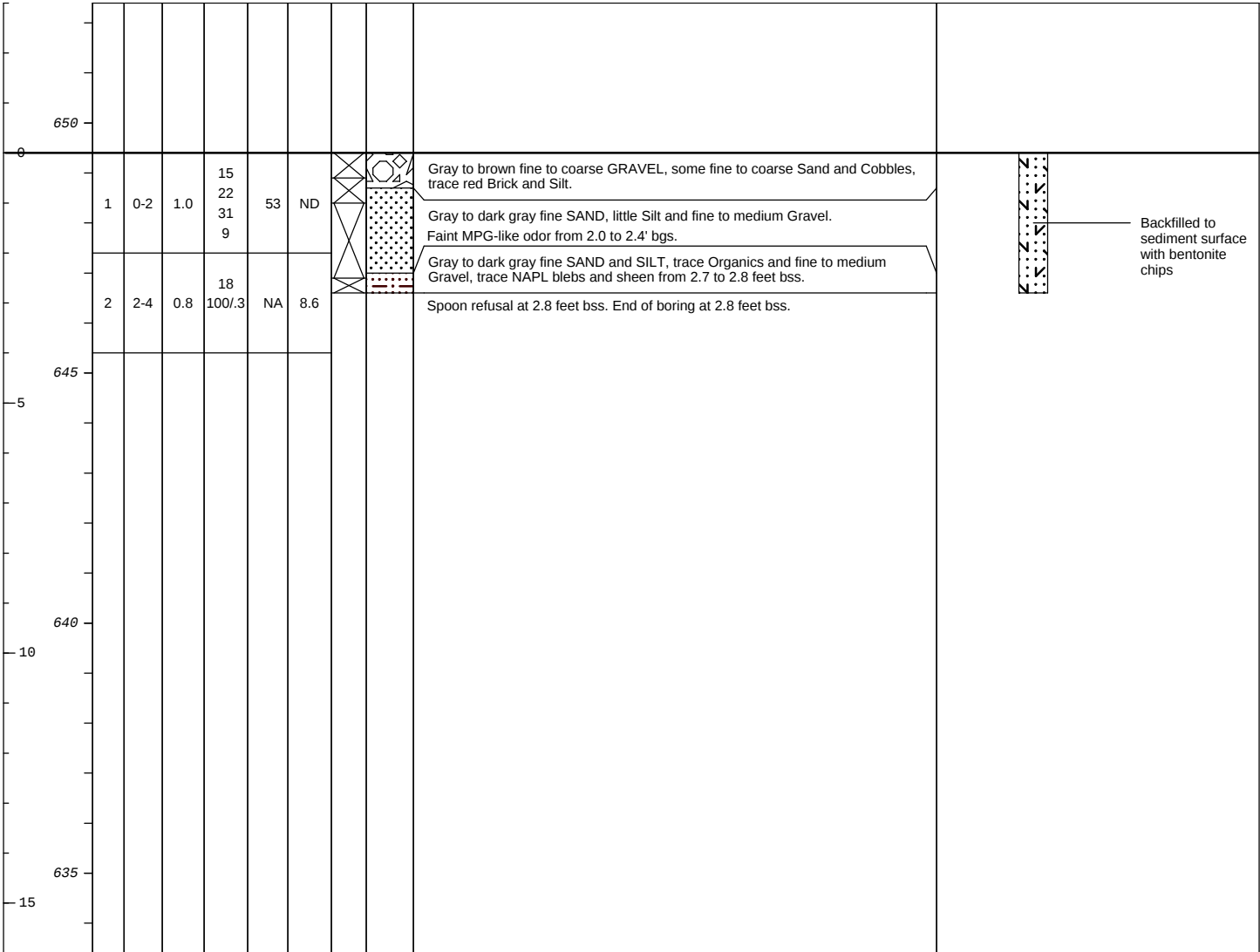
DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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0	0										
1	0-2	0.8	25 61 21 18	81	ND					Brown fine to coarse GRAVEL, some to little fine to coarse Sand, little Cobbles and Brick, trace Silt and Glass, saturated, non-plastic.	
2	2-3.5	0.7	14 16 65 100/0	NA	ND					Black fine to medium SAND, little Silt and fine to medium Gravel, faint to moderate degraded petroleum-like odor. Moderate MPG-like odor from 1.5 to 3.1 feet bgs. Gray to dark gray CLAY and SILT, little fine to subangular Gravel, till-like, little to trace Weathered Rock, little sheen, trace NAPL blebs, trace sheen from 3.1 to 3.5 feet bss.	
										Weathered ROCK, little Clay and Silt, trace fine Sand, little NAPL blebs, sheen is in between weathered rock and till, moderate MGP-like odor. End of boring at 3.5 feet bss.	Backfilled to sediment surface with bentonite chips
5	-5										
10	-10										
15	-15										

 ARCADIS <i>Infrastructure, environment, buildings</i>	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. 3 Attempts Analytical sample T-09-B collected at (0-.5'), (3-3.5') Archive sample collected at (1-3')
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Date Start/Finish:	9/15/2010	Northing:	1068974.0	Boring ID:	T-09-C
Drilling Company:	Parratt-Wolff	Easting:	822663.8	Client:	NYSEG
Driller's Name:	Doug Richmond	Water Depth:	1.3 feet	Location:	McMaster Street Former MGP Site Auburn, New York
Drilling Method:	140 lb. Hammer	Sediment Surface Elevation:	649.4 feet AMSL		
Casing Size:	4 inch	Borehole Depth:	2.8 feet bss		
Rig Type:	Barge Mounted Tripod	Descriptions By:	Marcus Eriksson		
Sampling Method:	3 inch x 2 feet Split Spoon				

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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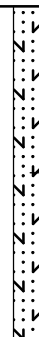
Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery;
Coordinates are based on the North American Datum of 1983, New York Central Zone.
Elevations are based on the North American Vertical Datum of 1988.

Analytical sample T-09-C collected at (0-.5'), (2.5-2.8')
Archive samples collected at (.5-1'), (1-2.5')

Date Start/Finish: 9/20/2010	Northing: 1068842.1	Boring ID: T-9a-A
Drilling Company: Parratt-Wolff	Easting: 822638.1	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 0.3 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 650.1 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 5.8 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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0	650	1	0-2	0.8	15 20 14 17	34	ND			Brown fine to coarse GRAVEL and fine to coarse SAND, little red Brick, trace Silt, saturated, non-plastic.	
		2	2-4	2.0	25 5 6 6	11	ND			Gray SILT and fine to medium SAND, some to little Clay and fine to coarse Gravel, till-like, saturated, non-plastic.	
5	645	3	4-6	1.7	5 5 50 75/0.3	55	ND			Faint odor from 5 to 5.7 feet bss.	
										Spoon refusal at 5.8 feet bss. End of boring at 5.8 feet bss.	
10	640										
15	635										



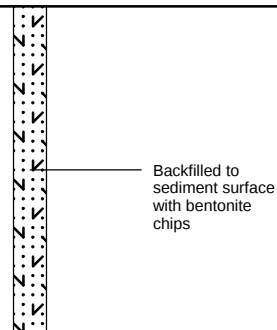
Backfilled to sediment surface with bentonite chips

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Analytical sample T-9a-A collected at (0-.5') Archive samples collected at (.5-1'), (1-3'), (3-5'), (5-5.7')
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Date Start/Finish: 9/21/2010	Northing: 1068946.4	Boring ID: T-9a-B
Drilling Company: Parratt-Wolff	Easting: 822668.5	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 0.4 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 649.5 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 5.7 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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650											
0		1	0-2	0.8	15 16 15 30	31	ND			Fine to coarse SAND and fine to medium subangular GRAVEL, trace red Brick and Silt, saturated, non-plastic.	
		2	2-4	0.2	16 18 31 21	49	ND				
645		3	4-6	1.7	24 29 65 75/0.2	95	ND			Brown SILT and SAND, little Clay, fine to coarse subangular Gravel, and weathered Rock, saturated, non-plastic.	
5										Transitions from brown to gray TILL to Weathered ROCK.	
										End of boring at 5.7 feet bss.	
640											
10											
635											
15											



	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. Analytical sample T-9a-B collected at (0-.5'), (5-5.7') Archive samples collected at (.5-1'), (1-3'), (3-5')
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Date Start/Finish: 9/21/2010	Northing: 1068914.0	Boring ID: T-9a-C
Drilling Company: Parratt-Wolff	Easting: 822649.6	Client: NYSEG
Driller's Name: Doug Richmond	Water Depth: 0.5 feet	Location: McMaster Street Former MGP Site Auburn, New York
Drilling Method: 140 lb. Hammer	Sediment Surface Elevation: 650.4 feet AMSL	
Casing Size: 4 inch	Borehole Depth: 2.0 feet bss	
Rig Type: Barge Mounted Tripod	Descriptions By: Marcus Eriksson	
Sampling Method: 3 inch x 2 feet Split Spoon		

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	Blow Counts	N - Value	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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0	650	1	0-2	2.0	5 6 12 6	18	ND			Gray fine to coarse GRAVEL and fine to coarse SAND, trace red Brick.	
										Gray weathered Rock and Till in tip of spoon at 2 feet bss. Spoon refusal at 2.0 feet bss. End of boring at 2.0 feet bss.	Backfilled to sediment surface with bentonite chips
5	645										
10	640										
15	635										

	Remarks: bss = below sediment surface; ND = non-detect; NA = not available/applicable; AMSL = Above Mean Sea Level; NR = No Recovery; Coordinates are based on the North American Datum of 1983, New York Central Zone. Elevations are based on the North American Vertical Datum of 1988. No analytical sample collected Archive samples collected at (0-.5'), (.5-1'), (1-2')
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Attachment 2

Forensic Evaluation Summary
Memorandum



ARCADIS of New York, Inc
6723 Towpath Road
P O Box 66
Syracuse
New York 13214-0066
Tel 315 446 9120
Fax 315 449 0017

MEMO

To:
File

Copies:
Stu Messur, ARCADIS
Jason Brien, PE, ARCADIS

From:
Ted Sauer, PhD
Jason Golubski, PE

Date:
May 18, 2011

ARCADIS Project No.:
B0013049

Subject:
NYSEG McMaster Street Sediment Pre-Design Investigation
Forensic Evaluation Summary

This memorandum presents the results of the forensic evaluation completed as part of the sediment pre-design investigation (PDI) for the NYSEG McMaster Street Former Manufactured Gas Plant (MGP) Site (the site) located in Auburn, New York.

The New York State Department of Environmental Conservation (NYSDEC) Record of Decision (ROD) (NYSDEC, 2009) requires "*Excavation and off-site disposal of sediments, as determined by a pre-design investigation, which contain NAPL, visible tar, produce a tar-related sheen when agitated in water, or which contain site-related [polycyclic aromatic hydrocarbons] PAH compounds that exceed background levels*". A PDI was conducted in August and September 2010 to delineate the extent of MGP-related impacts in sediment near the NYSEG McMaster Street site. As part of the sediment PDI, a forensic evaluation was conducted to assess the potential sources of PAHs detected in Owasco Outlet (the outlet) sediment. A summary of the sediment sampling activities, forensic evaluation procedures, and forensic evaluation results are presented below.

Sediment Sampling and Analysis Summary

As part of the McMaster Street sediment PDI, a total of 19 background sediment samples (including duplicates) were collected from 18 sampling locations extending approximately ¼ mile upstream from the former MGP site. A total of 63 delineation sediment samples were collected from 27 sampling locations adjacent to and downstream of the site. Samples from both McMaster Street background and McMaster

Street delineation areas were submitted for analysis for the 17 priority pollutant PAHs using USEPA SW-846 Method 8270 (PAH-17). A subset of eight background samples were selected for more detailed hydrocarbon analysis that included analysis for parent and alkyl group PAH concentrations (i.e., forensic PAHs) by modified EPA Method 8270C, and total hydrocarbon concentrations (i.e., forensic TPH) by modified EPA Method 8015. A NAPL sample was also collected from on-site monitoring well MW-06-11R and submitted for forensic PAHs and forensic TPHs for comparison to PAHs that were detected in outlet sediment samples.

Forensic Evaluation Procedures

The forensic evaluation was conducted in general accordance with the *Draft Remedial Design Work Plan* (RDWP) (ARCADIS, 2010)¹ and consisted of a preliminary forensic evaluation of all sediment samples using the PAH-17 results, which was supplemented by the results of the forensic PAH and TPH analyses of selected McMaster Street background samples. The preliminary forensic evaluation consisted of:

- Reviewing the total ion chromatograms (TICs) generated by the PAH-17 analysis to determine the presence of petroleum or other organic-type material in the river sediments.
- Calculating PAH diagnostic ratios (e.g., fluoranthene/pyrene [F]/[Py], benzo(a)anthracene/ chrysene [BAA]/[C]) to determine PAH compositional groupings to identify potential PAH sources in the sediments.
- Assessing the spatial relationships of PAH compositions and concentrations in the sediments upstream and adjacent to the site.

Based on the preliminary forensic analysis of the McMaster Street sediment samples, eight McMaster Street background samples were selected for forensic PAH and TPH analysis. Samples containing similar characteristics (i.e., similar PAH concentration, PAH composition, and spatial relation in the outlet) were grouped and select samples that represent the sample groups were analyzed for forensic PAHs and TPH.

Forensic Evaluation Results

The results for the forensic evaluations conducted for McMaster Street background and delineation samples are summarized in the following subsections.

¹ Only sediment PDI activities had been approved by NYSDEC prior to conducting the 2010 sediment PDI activities. NYSDEC approved the complete February 2010 Draft RDWP in a May 4, 2011 letter to NYSEG.

McMaster Street Background Sediment

Total PAH (i.e., PAH-17) concentrations for the McMaster Street background samples ranged from 13 to 300 milligrams per kilogram (mg/kg). Based on the results of the preliminary forensic evaluation, eight representative background sediment samples were selected and submitted for detailed forensic analyses. The PAH compositional distributions of the eight background samples submitted for forensic analyses (Figures 1a thru 1h) each showed PAH compositions characteristic of PAHs originating from pyrogenic sources (Stout et al., 2002). Obvious evidence of PAHs originating from petroleum sources was not observed in these samples. The PAH distribution for the NAPL sample is included as Figure 1i for comparison purposes.

The PAH compositional characteristics of the McMaster Street background samples are represented in the double ratio plot (BAA/C vs. Fl/Py) presented as Figure 2. As shown on Figure 2, the double ratio plot for the representative background samples are clustered, indicating a similar PAH composition. The relative PAH distributions in these eight samples further support the similarity of the PAH composition of the background sediment samples. The PAHs detected in McMaster Street background samples appear to originate almost exclusively from non-MGP related pyrogenic combustion sources with negligible contributions from petroleum sources. Potential sources of PAHs were well mixed in the sediment samples and a distinguishable specific source cannot be identified.

McMaster Street Delineation Sediment

As shown on Figure 3, with the exception of seven samples with total PAH concentrations ranging from 590 to 3,000 mg/kg, McMaster Street delineation samples contained total PAHs at concentrations within the range of McMaster Street background samples. However, as shown on the double ratio plot included as Figure 4a, the PAH composition of several delineation samples differs from the PAH composition of the background samples. The PAH compositions of McMaster Street delineation samples reflects a mixing of local (i.e., MGP- and unknown non-MGP-related impacts) and background (i.e., upstream) sources of PAHs. Potential PAH sources in McMaster Street delineation samples were identified based on a comparison of the detailed forensic results from the McMaster Street NAPL sample to the results of the preliminary forensic analysis (i.e., double ratio plot included as Figure 4a) for the delineation samples, as well as by elevated PAH concentrations in delineation samples that would indicate a potential MGP source (i.e., double ratio plot included as Figure 4b). As shown on Figure 4b, McMaster Street delineation sediment samples that contain PAHs at concentrations greater than 100 mg/kg generally have a potential PAH source similar to the McMaster Street NAPL sample. The potential PAH sources identified for McMaster Street delineation samples are summarized in the following table.

PAH Composition	PAH Concentration Range (mg/kg)	McMaster Street Delineation Sample Locations
Unknown, different than background, non-MGP-related	8.8 to 69	T-1-A (1'-3'), T-6-A (0.5'-1'), T-8-C (0.5'-2.8'), T-9-B (0.5'-3'), and T-9-C (0.5'-2.5')
Mixture of potential coal carbonization coal tar and background	55 to 230	T-4-B (3'-5'), T-5-C (3'-5'), T-8-A (1'-4.1'), T-9-A (0-1'), T-9a-A (5'-5.7'), T-9a-B (0'-0.5', 1'-3'), and T-9-B (3'-3.5')
Consistent with coal carbonization coal tar and McMaster Street NAPL	590 to 3,000	T-4-A (1'-2.7'), T-5a-B (1'-5'), T-7a-C (2.5'-2.8'), T-9a-A (1'-5'), and T-9-C (2.5'-2.8')
Consistent with McMaster Street background samples	0.62 to 52	T-1-A (0-1', 3-5'), T-1-C (0-5.1'), T-2-B (0-3'), T-2-C (0-3'), T-3-B (0-5.3'), T-3-C (0-5.5'), T-4-B (0-3', 5-5.7'), T-4-C (0.5-3'), T-5-B (0.5-1'), T-5-C (0-3'), T-5a-B (0.5-1'), T-6-A/PDI-2 (0-0.5', 1-3'), T-6-B (0-3'), T-6-C (0-2.5'), T-7-A (0-3'), T-7-B (0-0.7'), T-7-C (0-1'), T-8-A (0-1'), T-8-B (0-3'), T-8-C (0-0.5'), T-8-C (0-0.5'), T-9-A (1-3'), T-9-C (0-0.5'), T-9a-A (0-1'), and T-9a-B (0.5-1', 3-5.7')

References

Stout, S.A., A.D. Uhler, K.J. McCarthy, and S. Emsbo-Mattingly. 2002. Chemical fingerprinting of hydrocarbons. *In: Introduction to Environmental Forensics*, eds. B.L. Murphy and R.D. Morrison. London: Academic Press, pp. 137-260.

Figure 1. PAH Diagnostic Ratio Plot - BAA/C vs FI/Py
NYSEG McMaster St Background Sediment

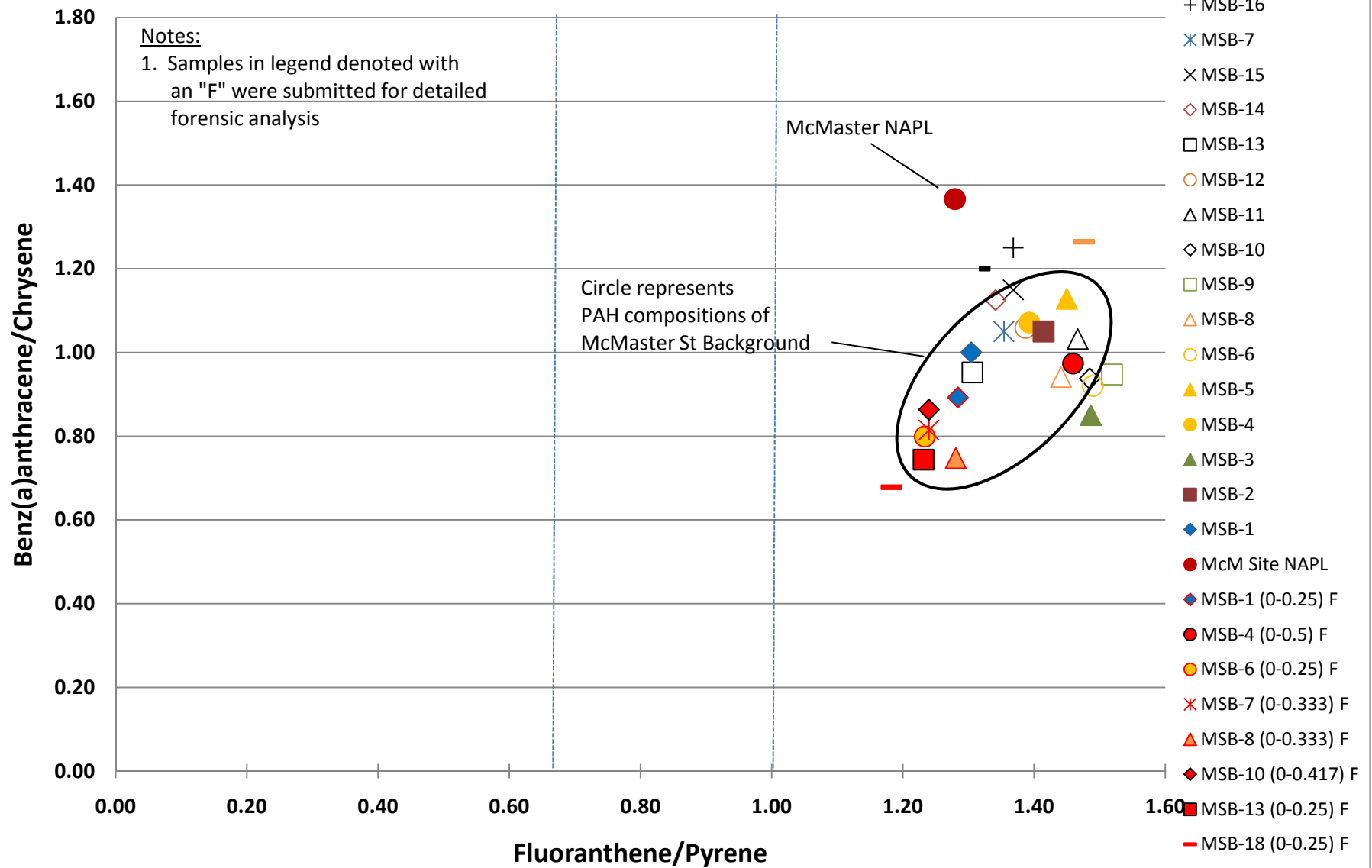


Figure 2a. PAH Distribution of MSB-1 (0-0.25')

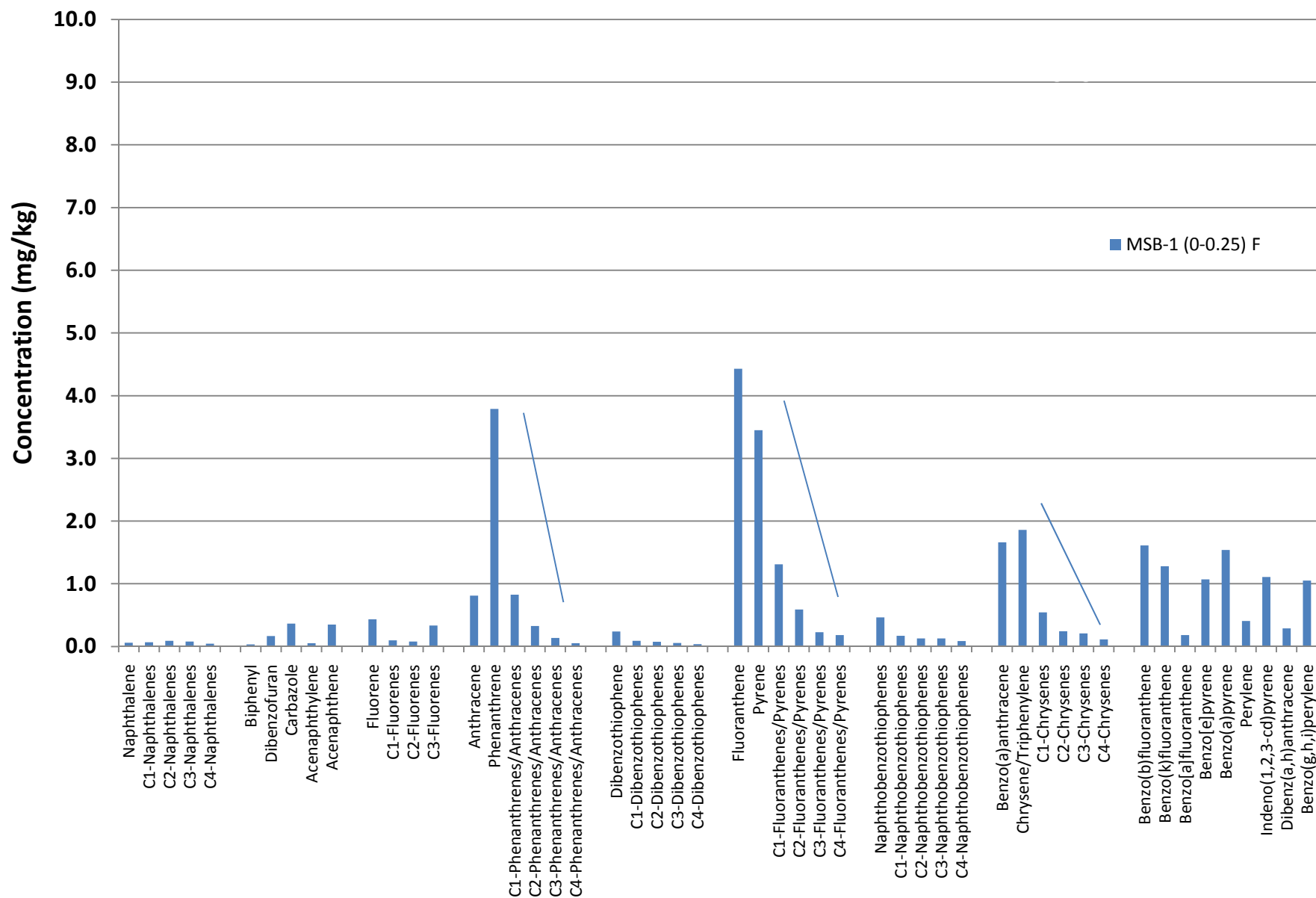


Figure 2b. PAH Distribution of MSB-4 (0-0.5')

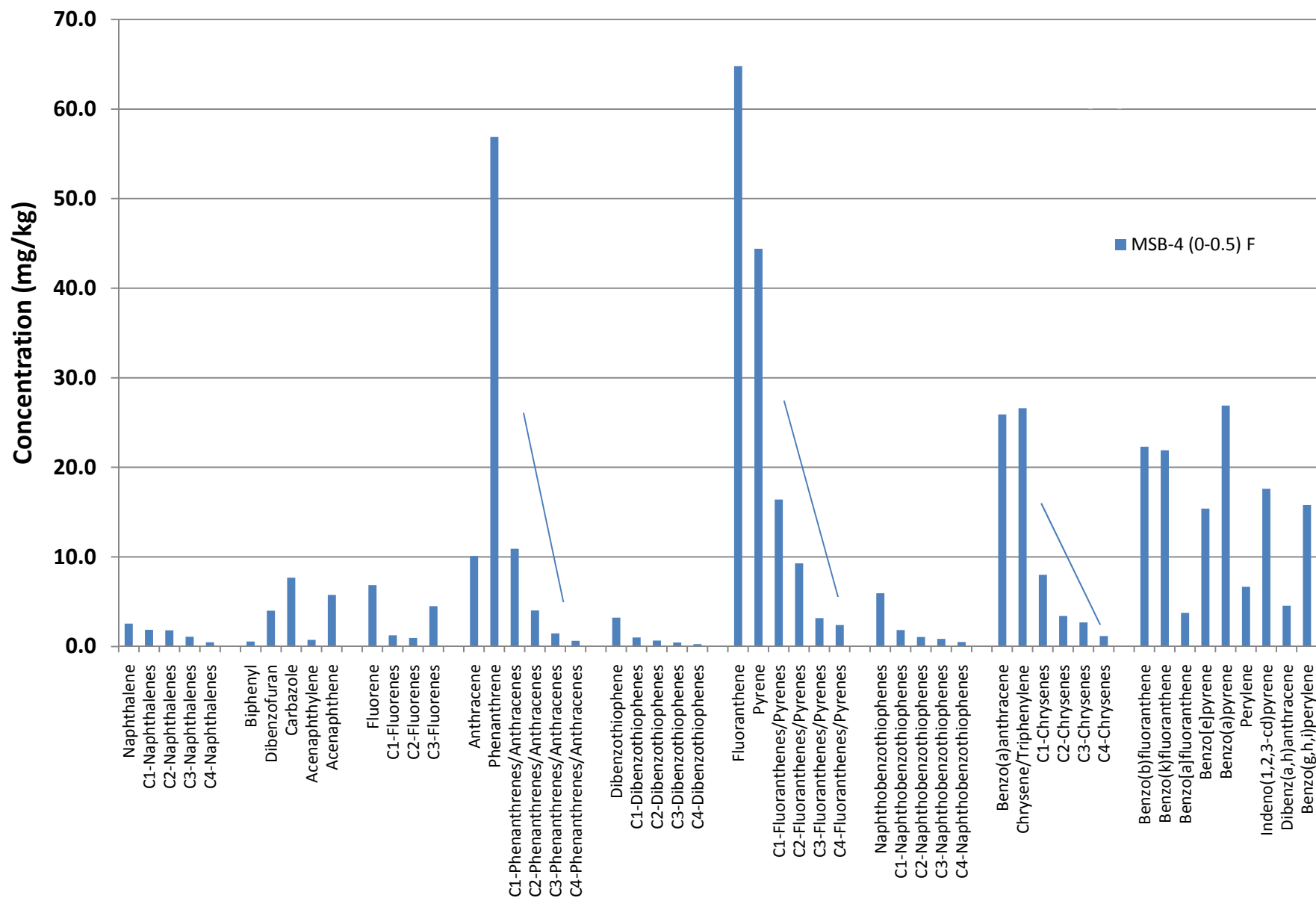


Figure 2c. PAH Distribution of MSB-6 (0-0.25')

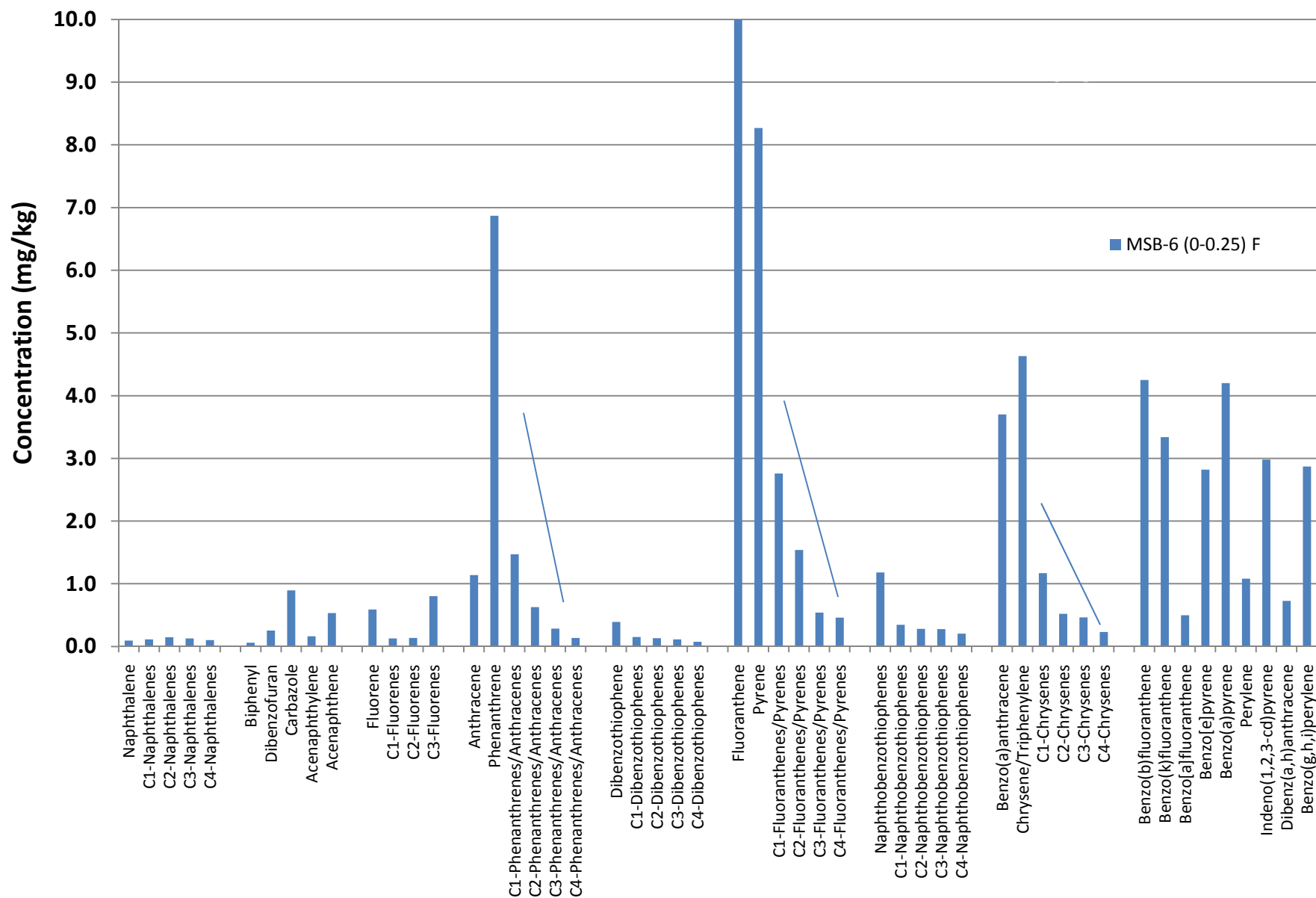


Figure 2d. PAH Distribution of MSB-7 (0-0.33')

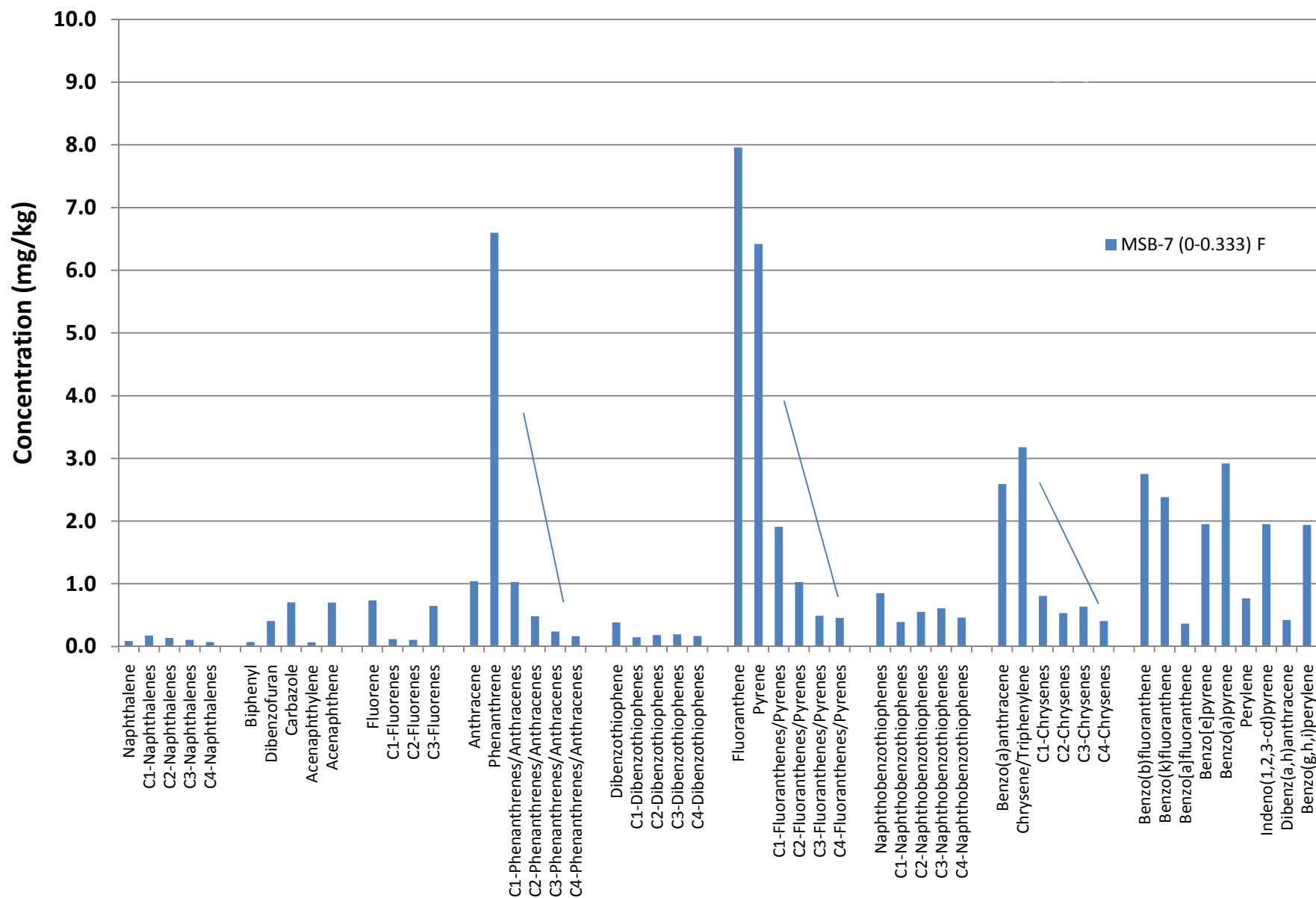


Figure 2e. PAH Distribution of MSB-8 (0-0.33')

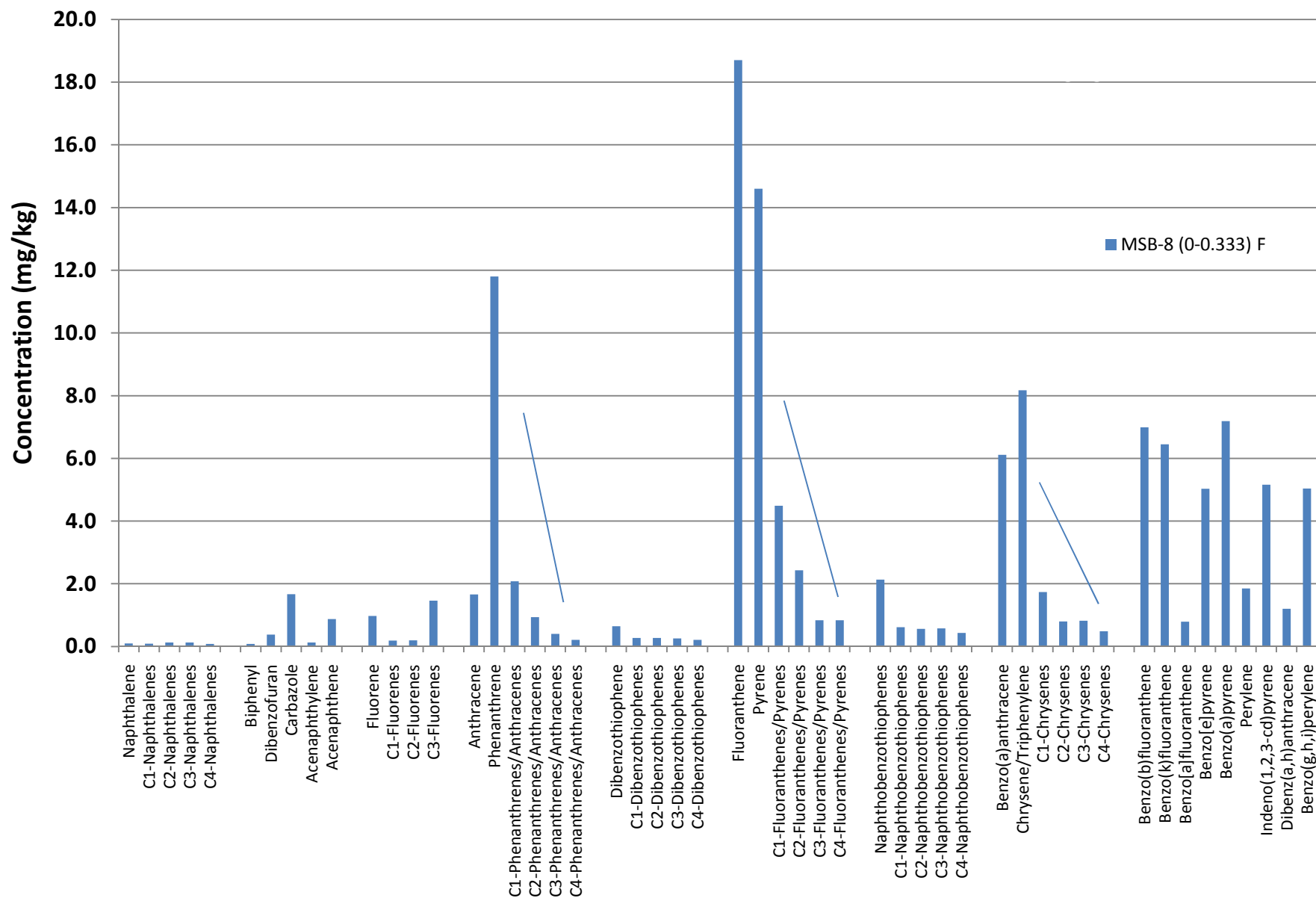


Figure 2f. PAH Distribution of MSB-10 (0-0.417')

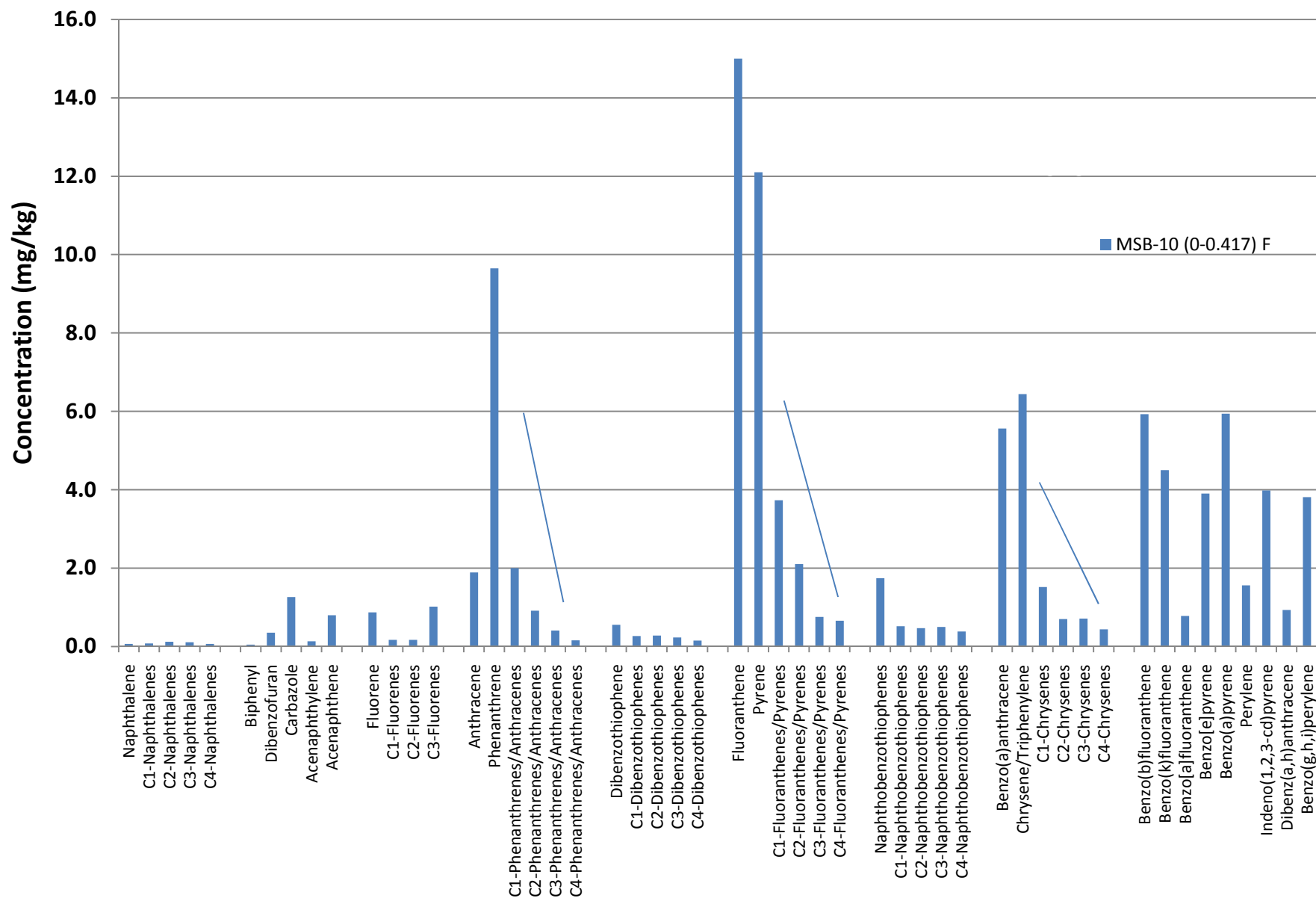


Figure 2g. PAH Distribution of MSB-13 (0-0.25')

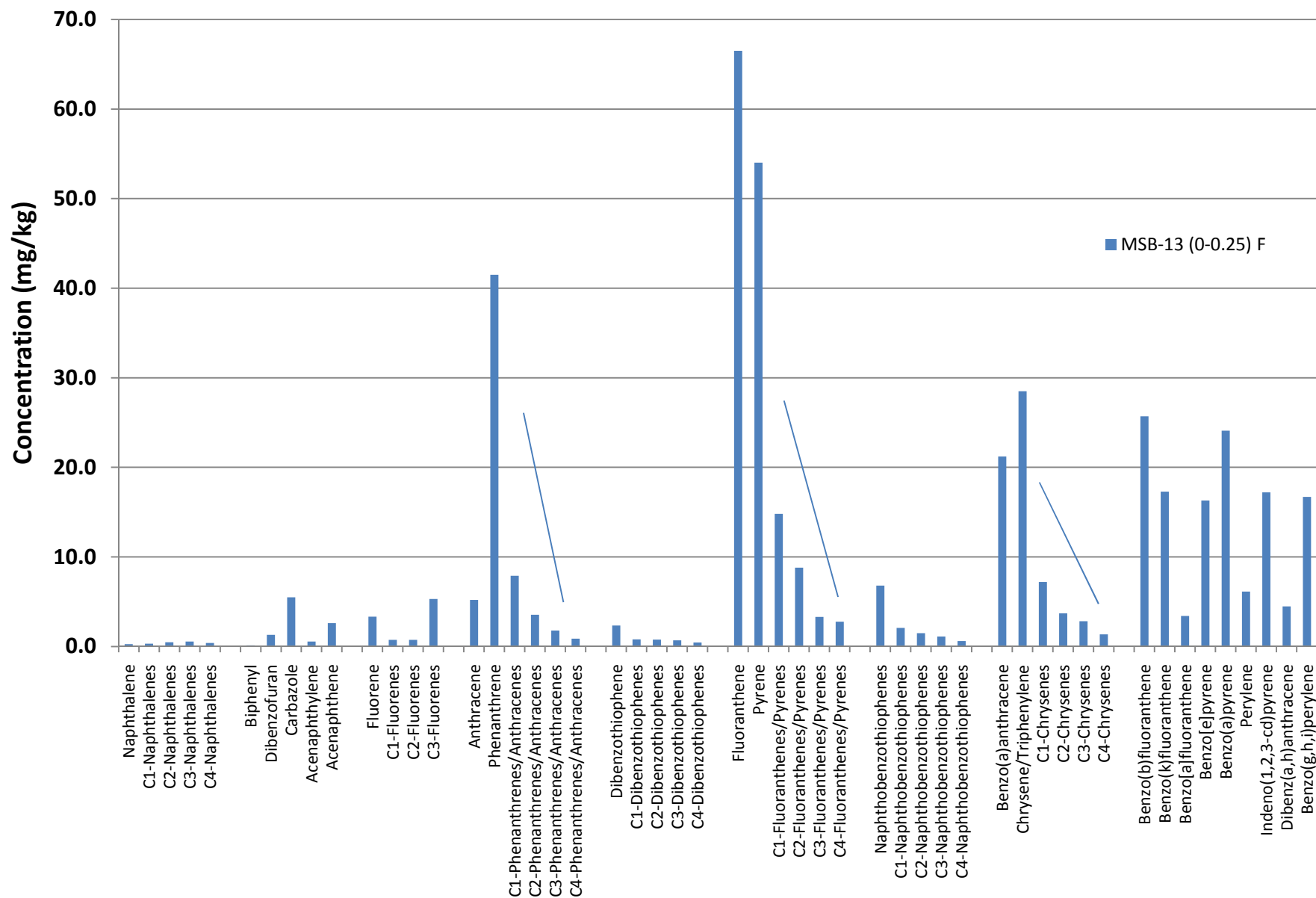


Figure 2h. PAH Distribution of MSB-18 (0-0.25')

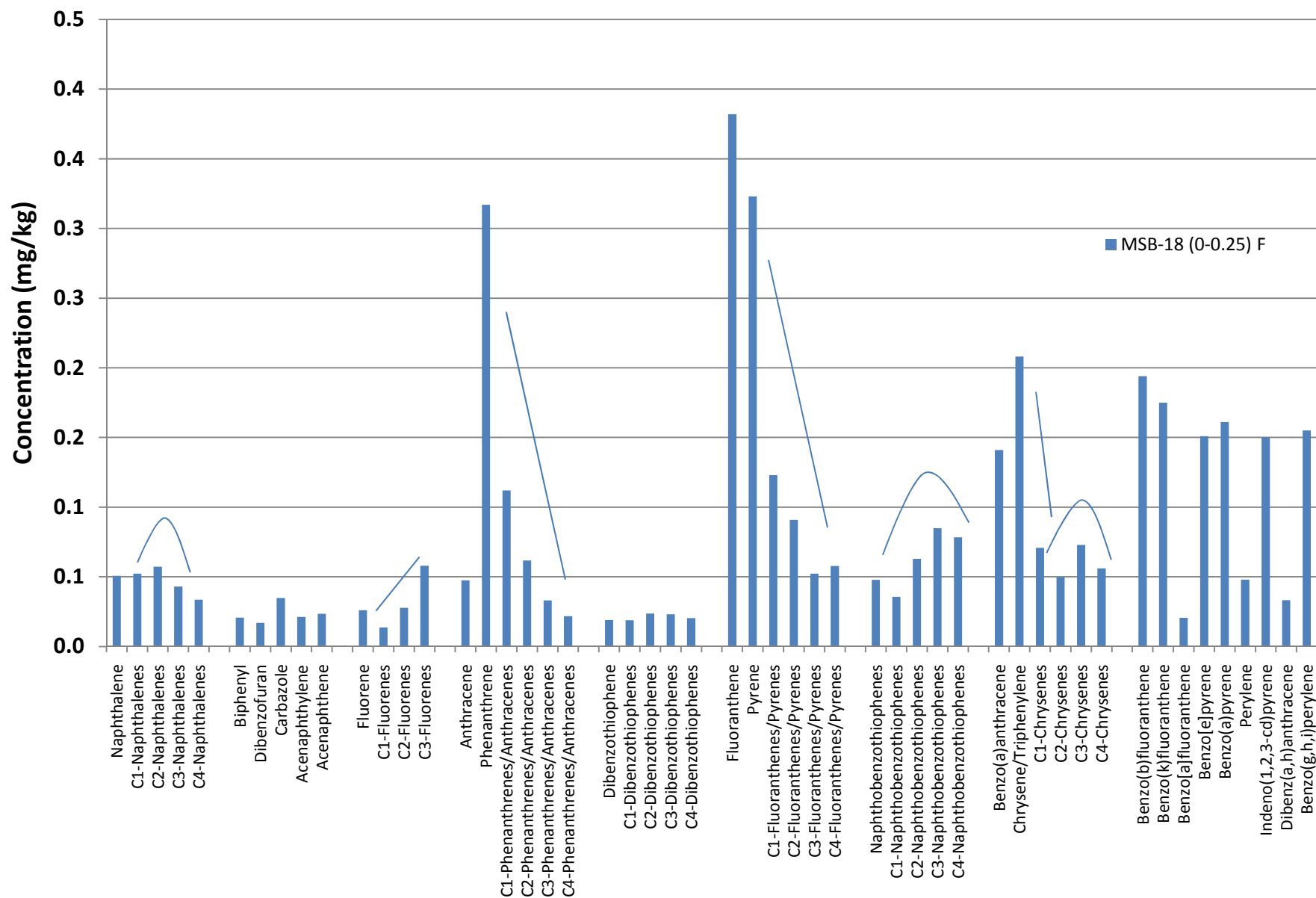
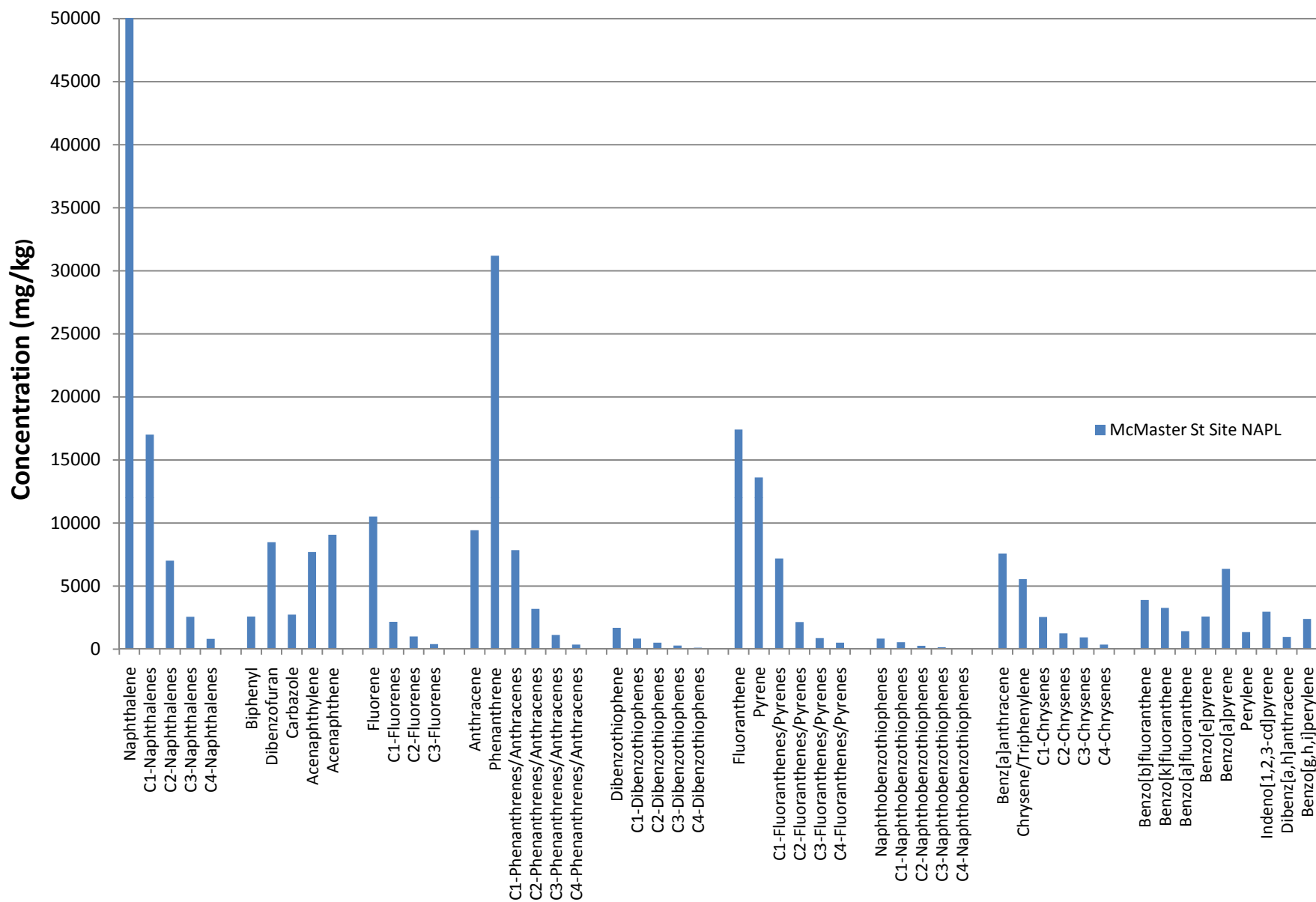
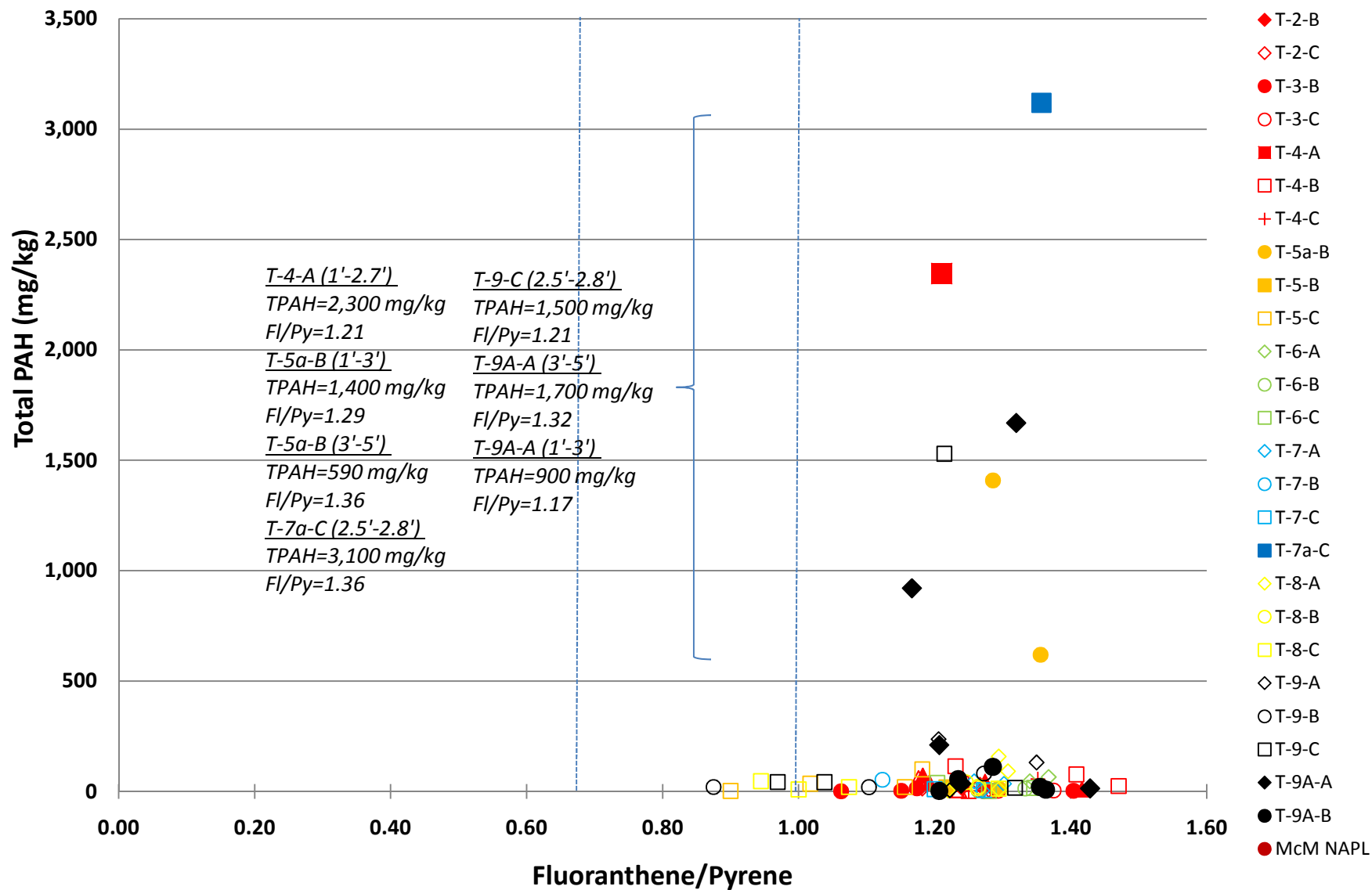


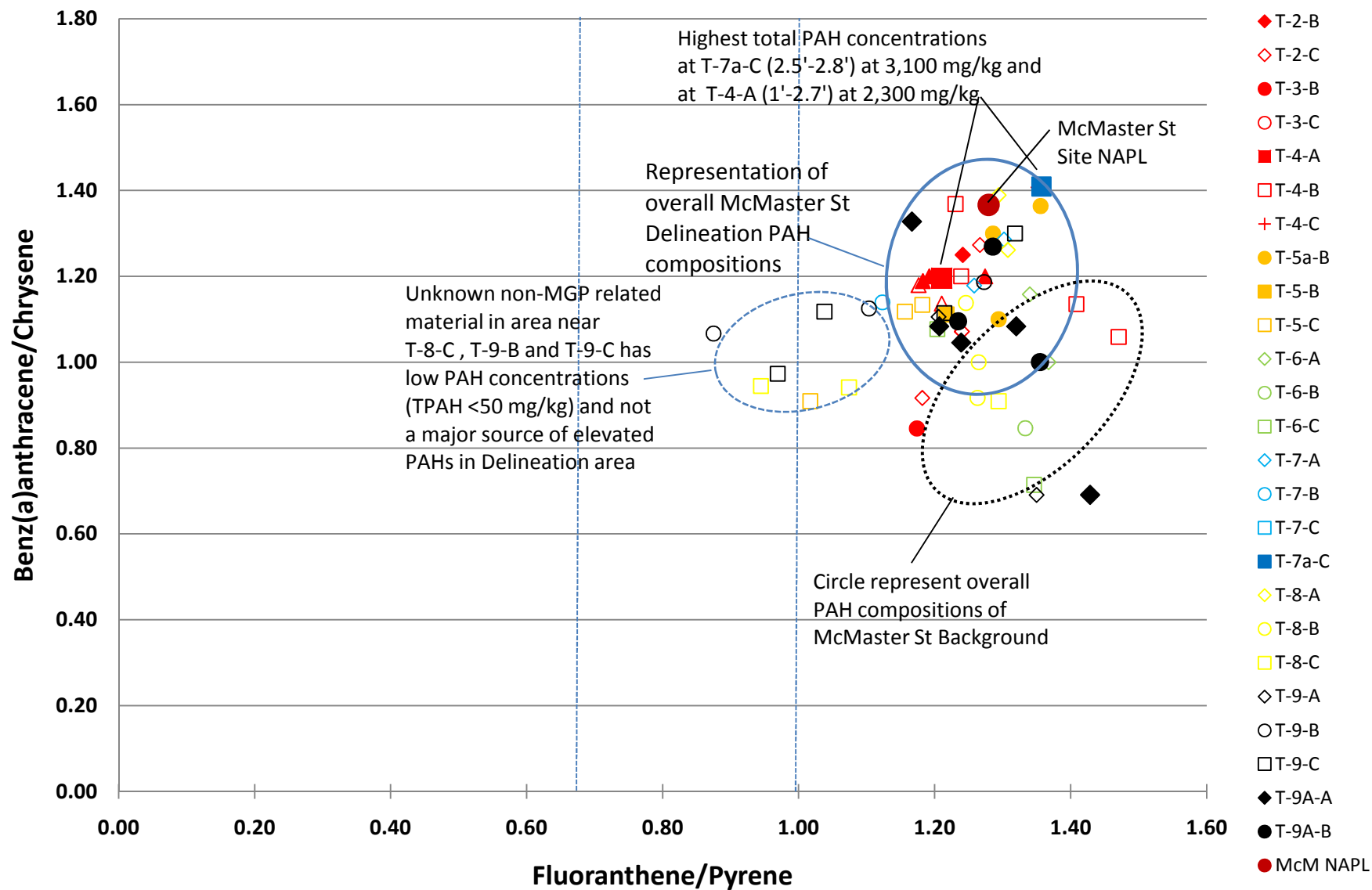
Figure 2i. PAH Distribtuion of McMaster St Site Coal Tar NAPL



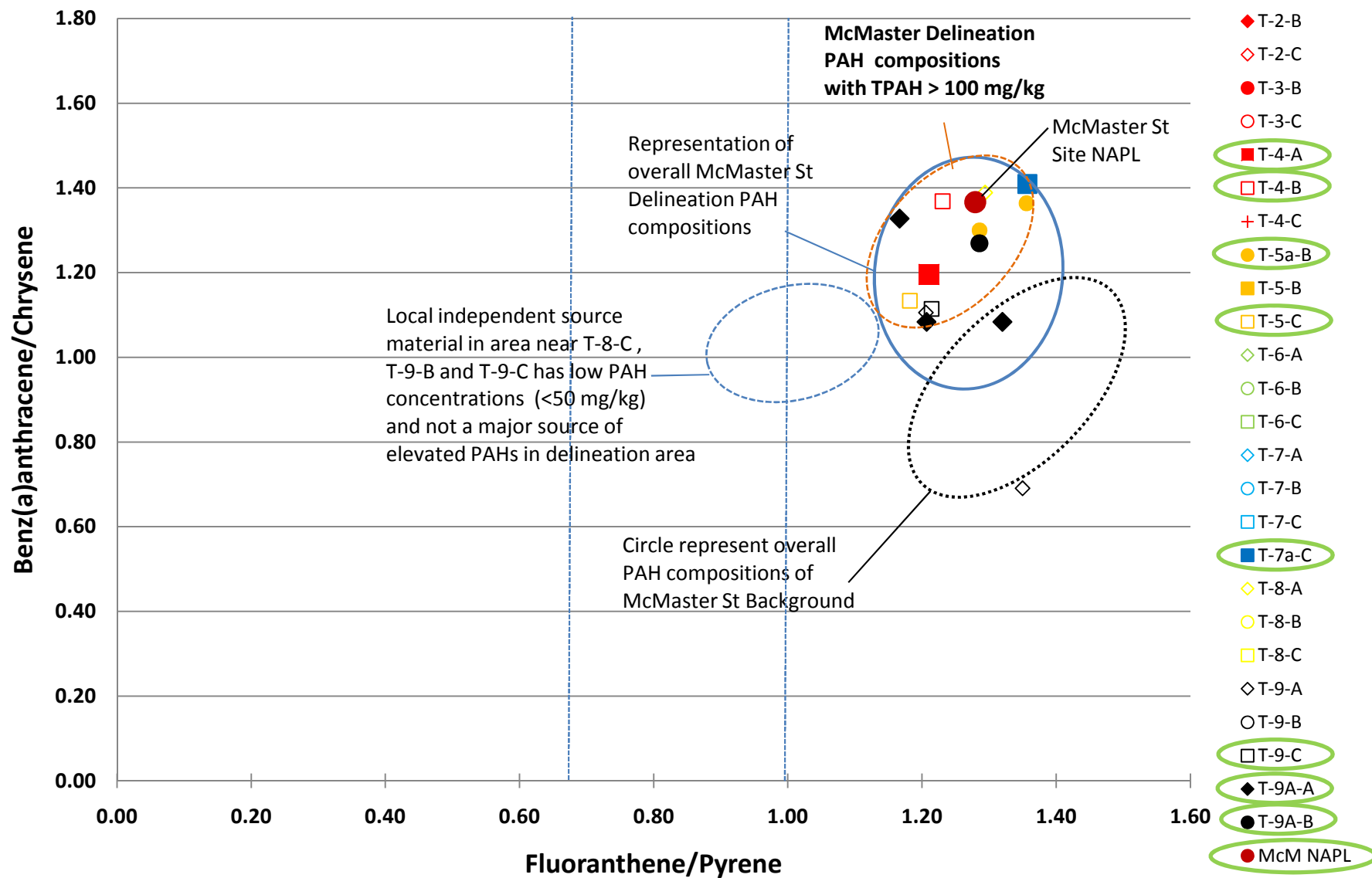
**Figure 3. PAH Diagnostic Ratio Plot - TPAH vs Fl/Py of All Samples >10 mg/kg
NYSEG McMaster St Delineation Sediment**



**Figure 4a. PAH Diagnostic Ratios - BAA/C v FI/Py of All Samples >10 mg/kg TPAH
NYSEG McMaster St Delineation Sediment**



**Figure 4b. PAH Diagnostic Ratios - BAA/C v FI/Py of All Samples >100 mg/kg TPAH
NYSEG McMaster St Delineation Sediment**



Attachment 3

Statistical Background Calculation
Sheet

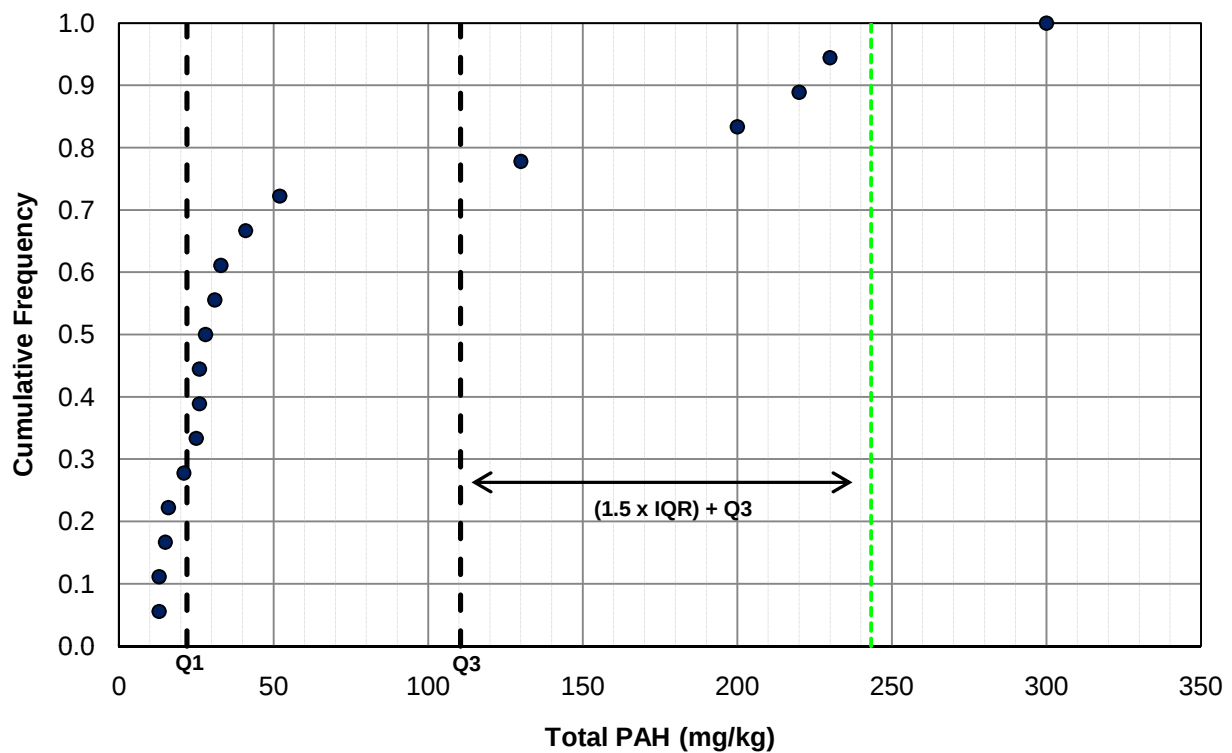
Attachment 3
Statistical Background Calculation Sheet

Sediment Pre-Design Investigation
NYSEG - McMaster Street Former Manufactured Gas Plant Site - Auburn, New York

Quartile Calculations (mg/kg):

1st Quartile (Q1)	22.0
3rd Quartile (Q3)	110.5
Interquartile Range (IQR)	88.5

Note: Summary Statistics generated using USEPA ProUCL (v. 4.00.05) software (USEPA, 2010).



Suspected Statistical Outliers (mg/kg):

MSB-13 300 J

Suspected outliers identified as results greater than 1.5 times the IQR (1) over the Q3 or (2) under Q1.

Summary Statistics:

75th percentile (all data) = 110.5 mg/kg

90th percentile (suspected outliers removed) = 208 mg/kg