



August 18, 2014

Mr. George T. Czerniak
Director, Air and Radiation Division
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60647

Ms. Nicole Cantello
Attorney-Advisor
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, IL 60647

RE: Analysis of HVAC Air Filters from Southeast Chicago (EH&E 19251)

Dear Mr. Czerniak and Ms. Cantello:

Environmental Health & Engineering, Inc. (EH&E) provides this report summarizing the chemical analyses of air filter samples obtained by the U.S. Environmental Protection Agency (EPA) of heating, ventilating, and air conditioning systems (HVAC) of two homes in the South Deering and East Side neighborhoods (“the Neighborhoods”) of Chicago, Illinois, during July 2014.

In summary, the levels of polynuclear aromatic hydrocarbons (PAHs) and metals in the air filters are not consistent with the presence of petroleum coke or coal, but instead are associated with indoor and outdoor air, settled house dust, and soil reported for Chicago and other urban areas in the United States. As detailed below, this conclusion is based on comparing proportions of indicator chemicals¹ measured in the air filters to proportions measured in 1) indoor and

¹ Indicators include the ratio of vanadium to nickel and proportions of 16 PAHs (naphthalene, acenaphthylene, acenaphthene, fluorene, anthracene, phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene, dibenz(a,h)anthracene. Values for additional PAHs (1- and 2-methylnaphthalene) were provided in lab analysis for the HVAC air filters but were unavailable in some of the reference data. We did examine proportions of the 16 PAHs included in this report, plus these additional PAHs in the media for which these data were available (i.e., soil, petroleum coke, coal), and our findings remain unchanged.

outdoor air, settled house dust, and soil of Chicago and other urban areas; and 2) petroleum coke and coal from the KCBX Terminal Company North and South terminals in Southeast Chicago.

HVAC AIR FILTER SAMPLES

EPA provided samples of air filters reported to have been obtained from the HVAC systems of two homes in the Neighborhoods during July 2014. EPA also provided additional filter material to be used as blank samples, although information on the origin of this material was not provided. EH&E received the samples on July 17, 2014. The samples were analyzed for PAHs and metals the following week.²

The HVAC filter results were compared to one another during a preliminary analysis. The total loading of PAHs and metals was greater in one of the filters compared to the other; however, the levels of PAHs and metals were strongly correlated between the two filters.³ Levels of PAHs and metals found in the two blank filters were comparable to one another. Proportions of metals detected in the used HVAC air filters were also consistent with proportions found in the blank samples. We also note that levels of naphthalene and 2-methylnaphthalene in one of the blank samples were higher than levels observed in its corresponding used HVAC air filter sample.

PETROLEUM COKE AND COAL SAMPLES

Petroleum coke and coal samples were collected from the KCBX North and South terminals in November 2013 and March 2014, then subsequently analyzed for concentrations of PAHs and metals. Results of those analyses were reported previously by EH&E⁴ and EPA.⁵

REFERENCE DATA

To aid with interpretation of the filter results, data were obtained for PAHs and metals in environmental media that could reasonably be expected to contribute to material captured by residential HVAC air filters. These media include: indoor air and outdoor air, settled house dust, and soil. These reference data include information for Chicago and other U.S. cities obtained from the peer-reviewed scientific literature as well as prior chemical analyses of soil from the Neighborhoods and surrounding areas.

² Chemical analyses of the air filters were carried out by TestAmerica Laboratories, Inc. located in Burlington, VT. For determination of PAHs, the filter samples were digested according to EPA Method 3550C and analyzed by gas chromatography-mass spectrometry in selective ion monitoring mode according to EPA Method 8270D SIM. For determination of metals, the metal wire integral to the filters was removed and then the filter media was digested according to EPA Method 3050B and analyzed by inductively coupled plasma-mass spectrometry according to EPA Method 6020A.

³ PAHs: $r = 0.82$, $p\text{-value} = <0.01$. Metals: $r = 0.86$, $p\text{-value} = <0.01$

⁴ <http://www2.epa.gov/sites/production/files/2014-03/documents/petcoke-coal-test-results-20130112.pdf>

⁵ <http://www2.epa.gov/petroleum-coke-chicago/analysis-pet-coke-samples>

Outdoor air values for Chicago from the Northbrook Water Plant air quality monitoring station were accessed from the EPA AirData web portal⁶ and from the Illinois Institute of Technology were obtained from the published literature.⁷ Settled house dust data for PAHs were obtained from a study conducted in urban areas within the United States.⁸ Values for indicator metals in settled house dust were not identified by the literature search conducted for this analysis. Indoor air values for indicator metals in Chicago were not identified at this time; therefore, data from elsewhere in the U.S. was used.⁹ In November 2013 soil samples were collected at bus stops, intersections, and parks throughout the Neighborhoods, and results of the PAH and metals analyses from those soil samples have been reported previously.¹⁰ At that time, additional soil samples were also collected in other Southeast Chicago neighborhoods adjacent to the South Deering/East Side neighborhoods. Additional reference values for soil in Chicago were obtained from a study conducted by the U.S. Geological Survey (USGS)¹¹ and from the Illinois Tiered Approach for Corrective Action (TACO) program.¹²

ANALYSIS

The proportions of 16 PAHs and the ratio of V:Ni in the HVAC air filter samples were compared to the corresponding values in petroleum coke and coal from the KCBX terminals, and in the reference air, settled dust, and soil.

⁶ <http://www.epa.gov/airquality/airdata/> Values were averaged over a five year period (2009-2013).

⁷ Franz, et al., 1998.

⁸ Whitehead et al., 2011. Data from the Mahler et al. (2010) study referenced in Table 4 (Whitehead, et al., 2011) was used in the HVAC filter analysis. These values from seven locations are the most complete median PAH profiles identified in the literature. All seven locations were well correlated with one another ($0.52 < r < 0.96$), indicating that PAH concentrations in settled house dust are relatively consistent across the country. The authors attribute minor differences in PAH concentrations mainly to geographic differences in traffic density and in use of coal-tar based pavement sealants.

⁹ Clougherty et al., 2010; Graney et al., 2004; Habre et al., 2014; Kinney et al., 2002; Polidori et al., 2009; Yankoleva et al., 1999.

¹⁰ <http://www2.epa.gov/sites/production/files/2014-03/documents/petcoke-coal-test-results-20130112.pdf>

¹¹ USGS, 2003.

¹² Illinois EPA, 2001.

PAHs in the HVAC air filters are not associated with petroleum coke or coal based on the correlation analysis summarized in Table 1. As shown in the “Source Material” rows of the table, correlations between PAHs found in the HVAC filters and source materials (i.e., petroleum coke and coal from the KCBX terminals) were weak and not statistically significant. In contrast, proportions of PAHs in the HVAC filter samples were strongly and statistically significantly associated with the proportions in outdoor air measured in Chicago, settled house dust measured in urban areas of the United States, the TACO program, and soil samples collected in other locations in Chicago (USGS) as well as in the Neighborhoods and surrounding areas (“Reference Data” listed in Table 1). The highly consistent correlations among these media show the strong influence of urban background levels of PAHs.

Table 1 Comparison of Profiles of PAHs Measured in HVAC Air Filter Samples to Petroleum Coke and Coal Samples and Reference Data				
Data Source	Correlation Coefficient Filter 1	p-value	Correlation Coefficient Filter 2	p-value
Source Material				
Petroleum coke ¹	0.06	0.84	0.12	0.67
Coal ¹	0.14	0.62	0.08	0.78
Reference Data				
Outdoor air ²	0.89	<0.01	0.87	<0.01
Settled house dust ³	0.74	<0.01	0.76	<0.01
USGS (soil) ⁴	0.79	<0.01	0.72	<0.01
TACO (soil) ⁵	0.82	<0.01	0.80	<0.01
Southeast Chicago neighborhoods (soil) ¹	0.78	<0.01	0.73	<0.01
South Deering/East Side neighborhoods (soil) ¹	0.74	<0.01	0.70	<0.01
Correlation coefficients range between -1 to 1. Absolute values greater than 0.7 indicate a strong correlation between groups.				
p-values <0.01 indicate that the correlation between groups are statistically significantly different from zero at the 0.01 confidence level.				
¹ Sampling data ² Franz, et al, 1998. ³ Whitehead et al., 2011. ⁴ USGS, 2003. ⁵ Illinois EPA, 2001				

V:Ni ratios measured in HVAC filter samples (median ratio=0.68) were similar to those observed in the indoor air of homes in urban areas in the U.S as well as in the outdoor air of Chicago, as shown in Figure 1. The V:Ni ratios measured in soil and air were nearly ten-fold less than ratios observed in petroleum coke and coal (median values 3.5 and 4.4, respectively), also shown in Figure 1.

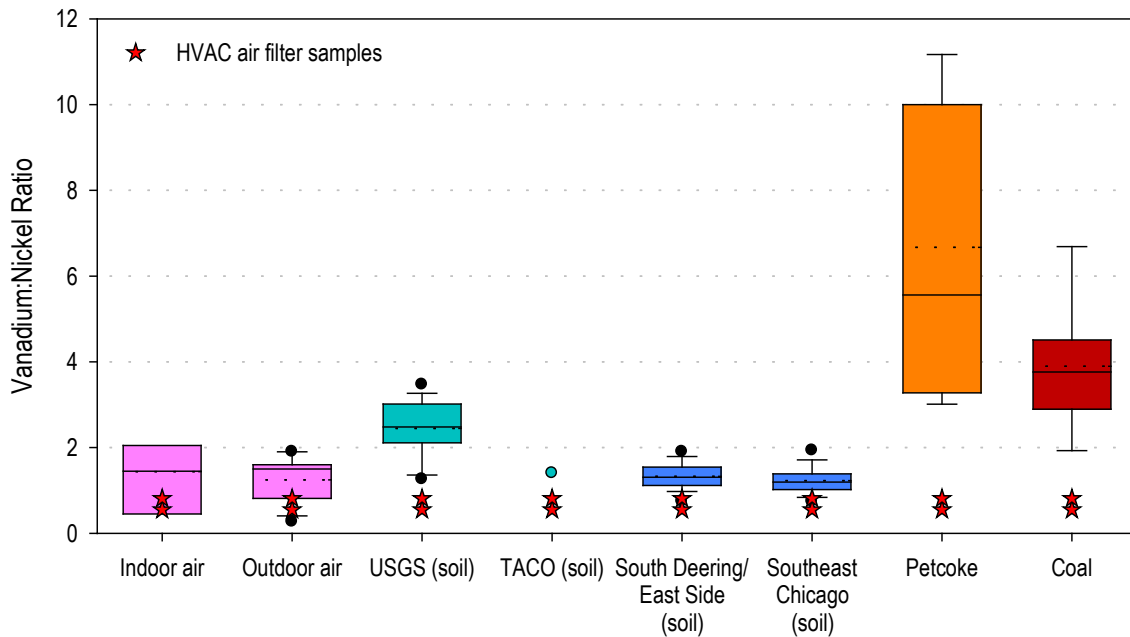


Figure 1 Vanadium to Nickel Ratios for Reference Soil and Air Samples and Source Material Samples of Petcoke and Coal Compared to HVAC Air Filter Samples from Two Chicago Homes

CONCLUSION

The data available for the two HVAC air filters at this time provide no evidence of windborne transport of petroleum coke and coal from the KCBX terminals to the surrounding community. Instead, levels of PAHs and metals in the HVAC air filter samples are highly consistent with anthropogenic background levels observed in air, settled house dust, and soil of Chicago and other urban areas in the U.S. These findings indicate that the PAHs and metals found in air filters from the Neighborhoods reflect background conditions in the Southeast Chicago area rather than impacts of petroleum coke or coal.

If you have any comments or questions regarding this report, please contact me at 1-800-TALK EHE (1-800-825-5343).

Sincerely,

A handwritten signature in black ink, appearing to read 'DL MacIntosh', with a long horizontal flourish extending to the right.

David L. MacIntosh, Sc.D., C.I.H.
Chief Science Officer

Appendix A Bibliography

Appendix B Laboratory Report for HVAC Filter Analyses

P:\19251\Monitoring Results\HVAC Air Filter Summary Report.docx

APPENDIX A

BIBLIOGRAPHY

BIBLIOGRAPHY

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APPENDIX B

LABORATORY REPORT FOR HVAC FILTER ANALYSES

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Burlington

30 Community Drive

Suite 11

South Burlington, VT 05403

Tel: (802)660-1990

TestAmerica Job ID: 200-23277-1

Client Project/Site: Filter Sample


For:

Environmental Health & Engineering

117 Fourth Avenue

Needham, Massachusetts 02494-2725

Attn: Kathleen Brown



Authorized for release by:

7/30/2014 6:34:30 PM

Stephanie Sanders, Project Manager I

(303)736-0196

stephanie.sanders@testamericainc.com

LINKS

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Job ID: 200-23277-1

Laboratory: TestAmerica Burlington

Narrative

CASE NARRATIVE

Client: Environmental Health & Engineering

Project: Filter Sample

Report Number: 200-23277-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 07/22/2014; the samples arrived in good condition, properly preserved and on ice. The temperature of the cooler at receipt was 3.2 C.

PAH containers received in clear 16oz jars and wrapped in aluminum foil.

No date or times listed on the container labels. Logged in per sample date and times listed on the COC.

Per client request, the sample filters were weighed and measured prior to analysis. The following are the weights and measurements for the samples:

- Sample 1407001-15 PAH Filter dimensions of 15.8cm x 10.9cm and weight of 2.43g (metal mesh included)
- Sample 1407001-15 Metals Filter dimensions of 17.4cm x 10.0cm and weight of 1.40g (metal mesh removed)
- Sample 1407001-16 PAH Filter dimensions of 12.0cm x 10.5cm and weight of 2.93g (metal mesh included)
- Sample 1407001-16 Metals Filter dimensions of 12.4cm x 9.9cm and weight of 1.35g (metal mesh removed)
- Sample 1407004-01 PAH Filter dimensions of 19.2cm x 9.5cm and weight of 2.72g (metal mesh included)
- Sample 1407004-01 Metals Filter dimensions of 16.7cm x 9.5cm and weight of 0.91g (metal mesh removed)
- Sample 1407004-02 PAH Filter dimensions of 17.9cm x 8.7cm and weight of 2.12g (metal mesh included)
- Sample 1407004-02 Metals Filter dimensions of 18.3cm x 9.0cm and weight of 0.89g (metal mesh removed)

SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)

Samples 1407001-15, 1407001-16, 1407004-01 and 1407004-02 were analyzed for semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with 8270D SIM. The samples were prepared on 07/24/2014 and analyzed on 07/29/2014.

The samples were received by the lab outside the validated holding time for extraction solid matrix samples. The results reported the samples are flagged accordingly.

Internal standard (ISTD) response for the following samples was outside control limits: 1407004-01, 1407004-02. The samples were re-analyzed with concurring results and both sets of data have been reported.

Samples 1407001-15[3.33X] and 1407001-16[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Case Narrative

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Job ID: 200-23277-1 (Continued)

Laboratory: TestAmerica Burlington (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

METALS (ICPMS)

Samples 1407001-15, 1407001-16, 1407004-01 and 1407004-02 were analyzed for metals (ICPMS) in accordance with 6020A. The samples were prepared on 07/25/2014 and analyzed on 07/28/2014 and 07/29/2014.

Due to sample matrix effect on the internal standard (ISTD), a dilution was required for the following sample for Arsenic, Selenium, and Lead: 1407001-15.

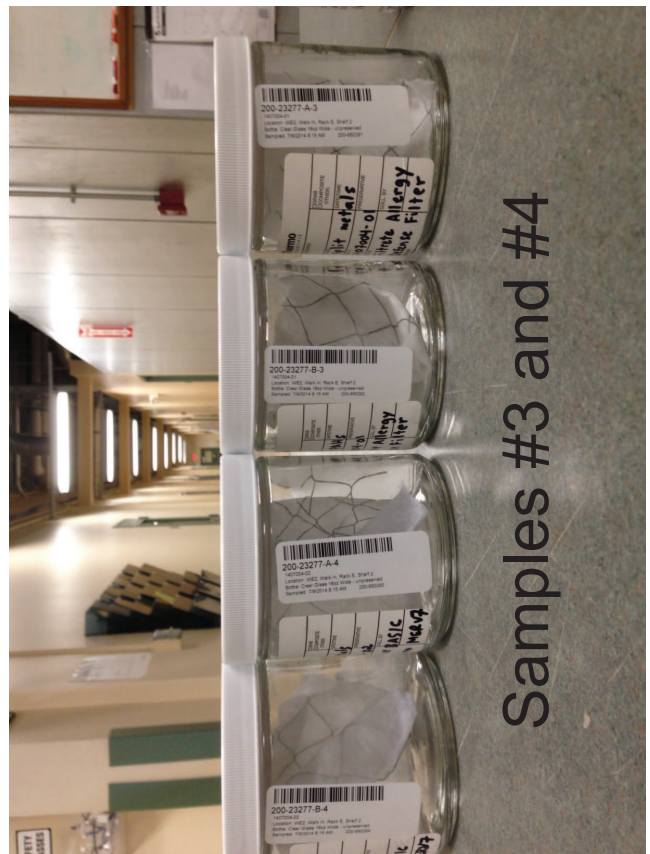
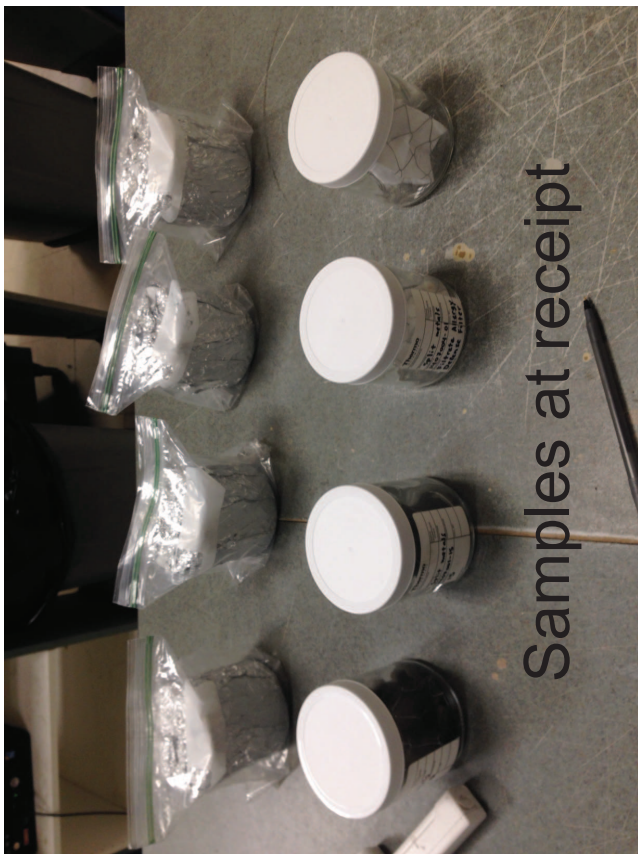
The following sample was diluted to bring the concentration of Sodium and Zinc within the calibration range: 1407001-15. Elevated reporting limits (RLs) are provided.

Internal standard responses were outside of acceptance limits for the following sample: 1407001-15. The sample shows evidence of matrix interference. Thallium recovers below the reporting limit when run both undiluted and at dilutions, therefore the undiluted analysis is reported.

Arsenic and Thallium were detected in method blank MB 200-75341/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Samples 1407001-15[10X] and 1407001-15[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



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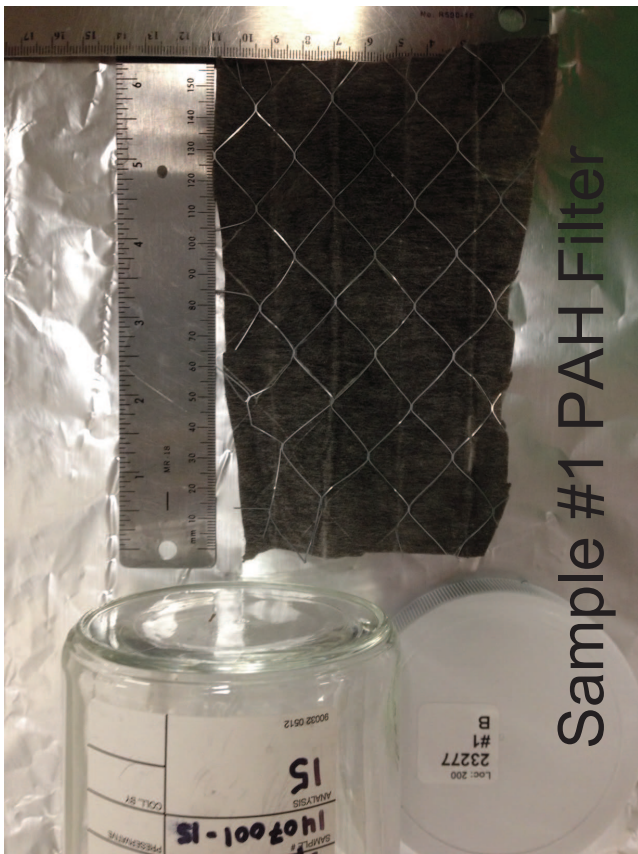
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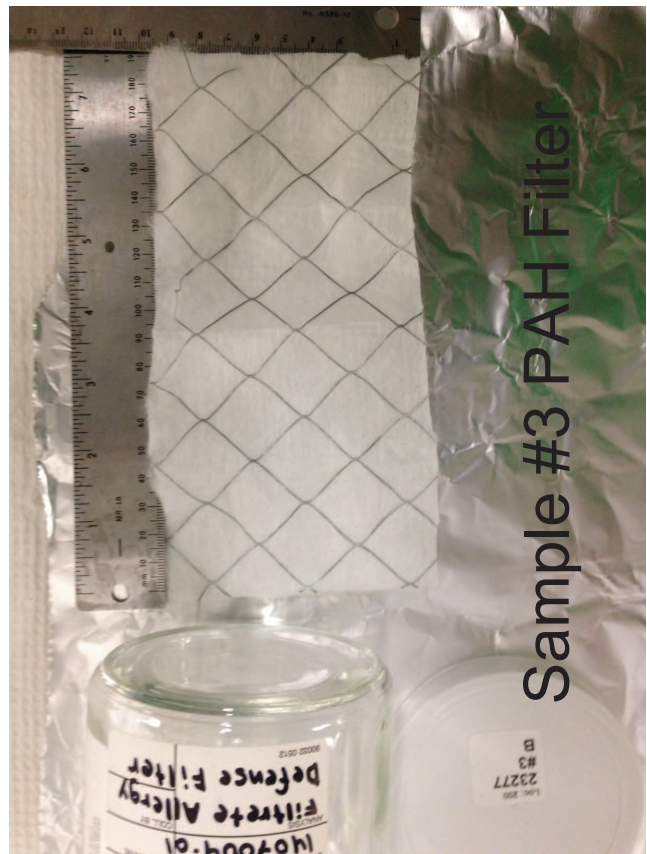
Sample #2 PAH Filter



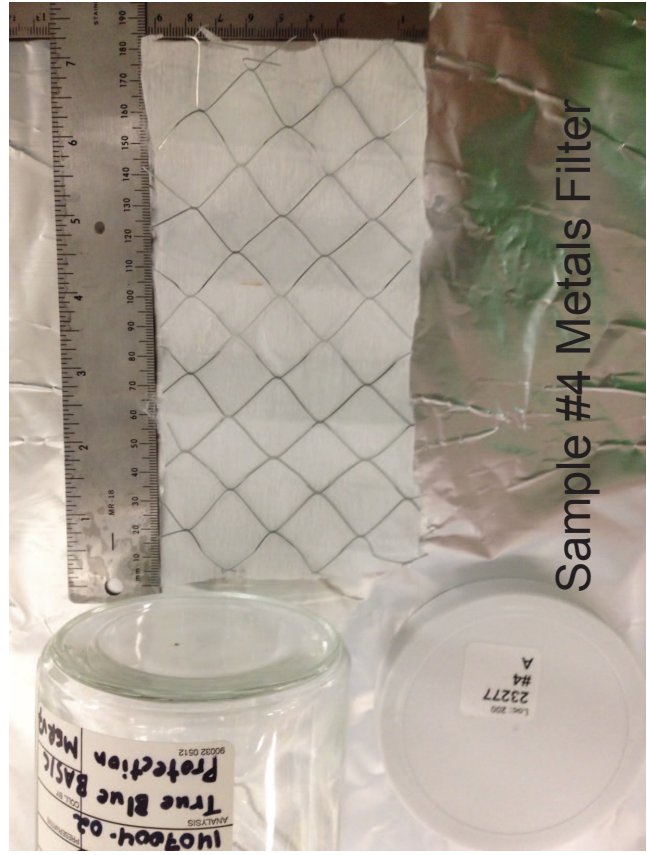
Sample #4 PAH Filter

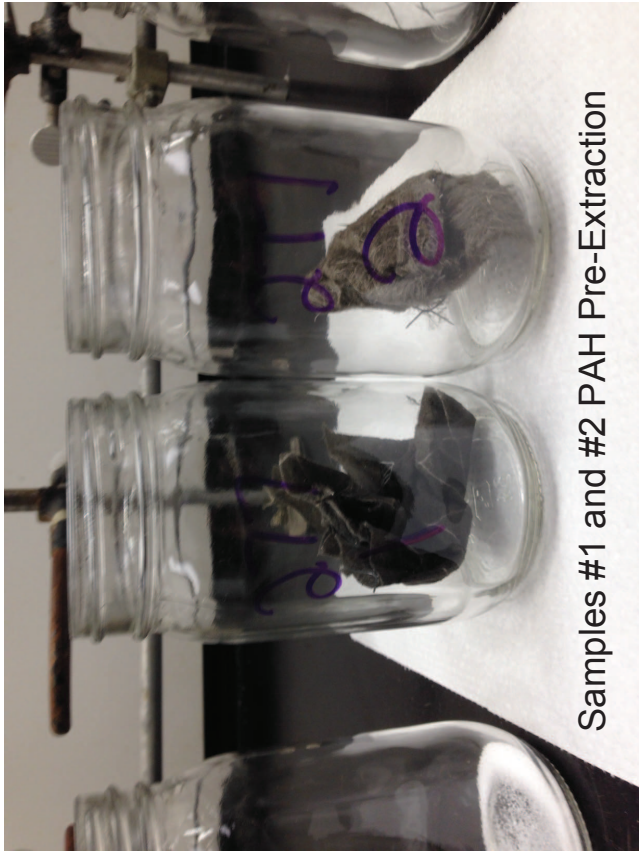


Sample #1 PAH Filter



Sample #3 PAH Filter





Samples #1 and #2 PAH Pre-Extraction



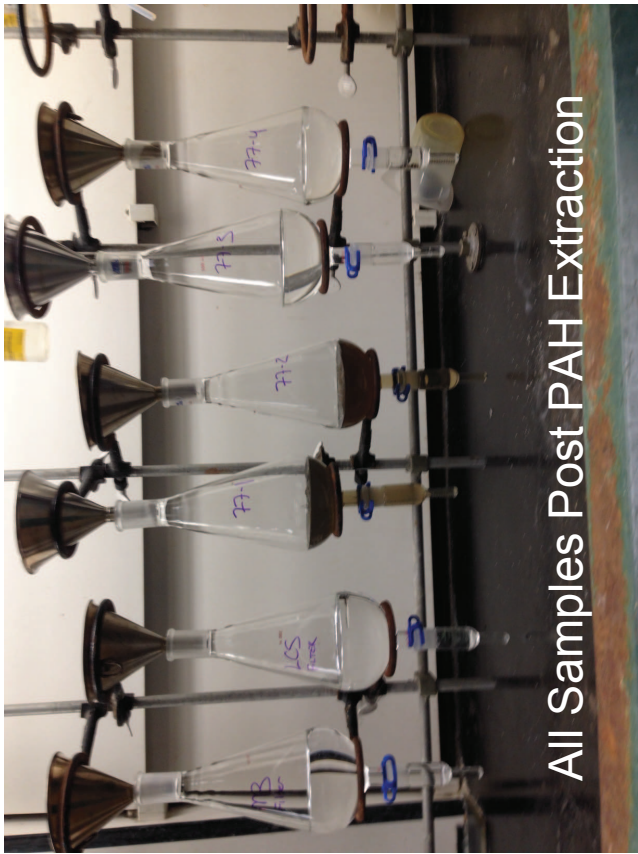
Lab QC PAH Pre-Extraction



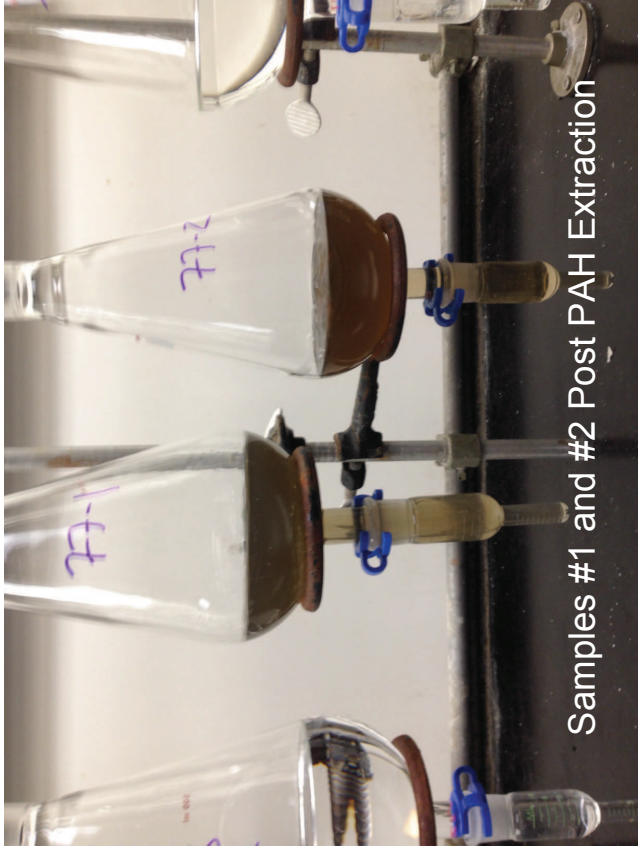
Samples #3 and #4 PAH Pre-Extraction

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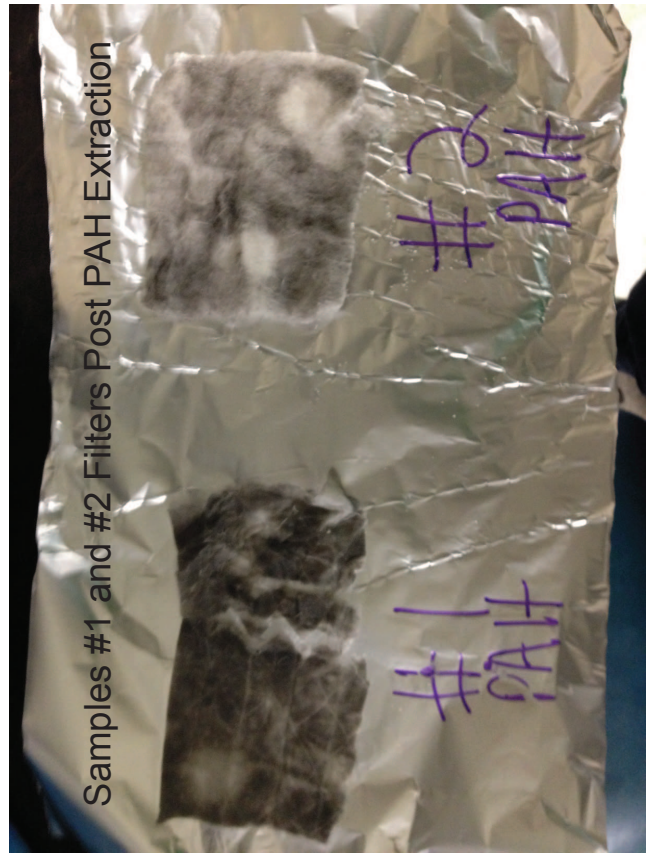




All Samples Post PAH Extraction

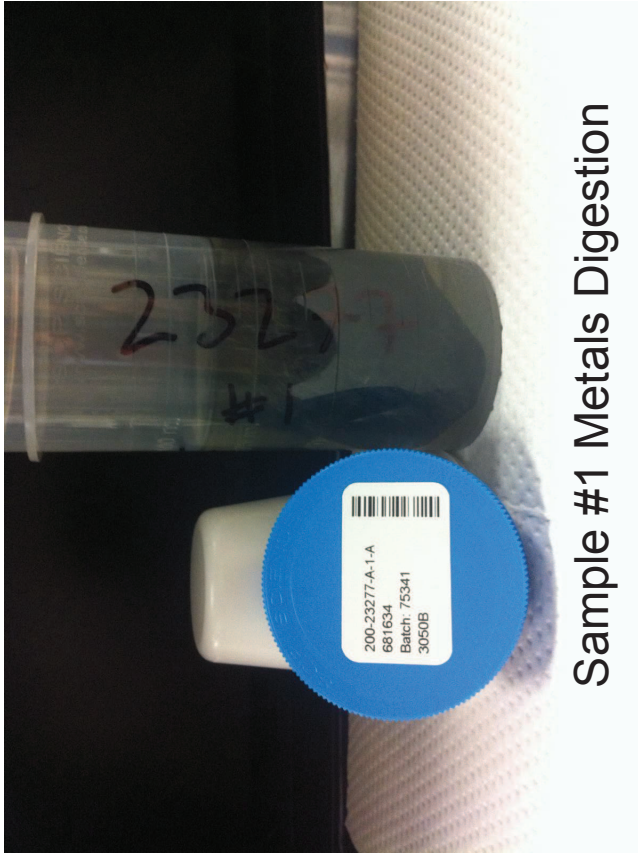


Samples #1 and #2 Post PAH Extraction



Samples #1 and #2 Filters Post PAH Extraction

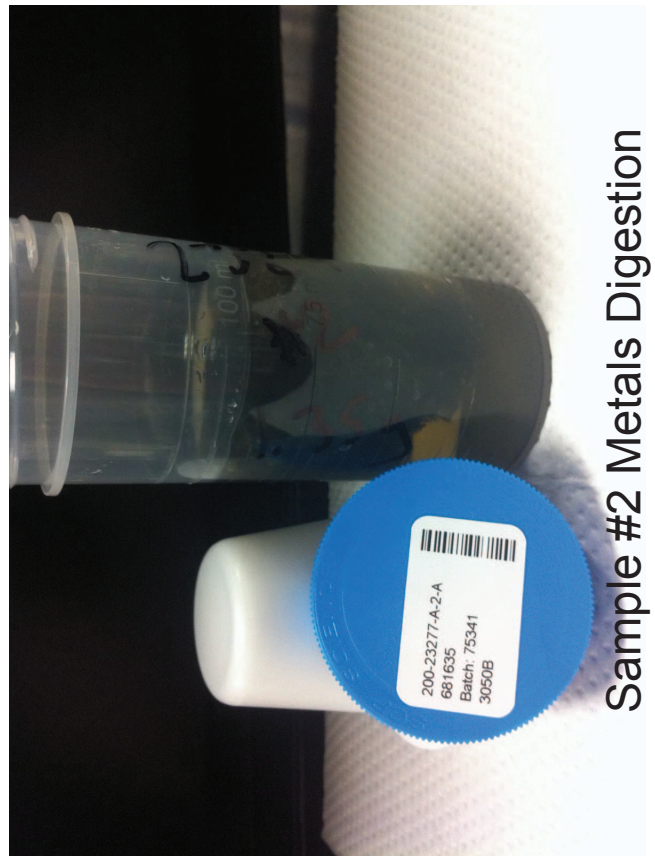
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Sample #1 Metals Digestion



All Samples Metals Digestion



Sample #2 Metals Digestion

Method Summary

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Method	Method Description	Protocol	Laboratory
8270D SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	TAL BUR
6020A	Metals (ICP/MS)	SW846	TAL BUR

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL BUR = TestAmerica Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990



Sample Summary

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
200-23277-1	1407001-15	Filter	07/01/14 14:16	07/22/14 08:55
200-23277-2	1407001-16	Filter	07/01/14 14:26	07/22/14 08:55
200-23277-3	1407004-01	Filter	07/09/14 08:15	07/22/14 08:55
200-23277-4	1407004-02	Filter	07/09/14 08:15	07/22/14 08:55

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Detection Summary

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Client Sample ID: 1407001-15

Lab Sample ID: 200-23277-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	0.20	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
2-Methylnaphthalene	0.22	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
1-Methylnaphthalene	0.093	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Fluorene	0.094	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Phenanthrene	2.0	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Fluoranthene	1.4	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Pyrene	1.3	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Benzo[a]anthracene	0.35	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Chrysene	1.2	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Benzo[b]fluoranthene	1.3	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Benzo[k]fluoranthene	0.96	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Benzo[e]pyrene	1.2	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Benzo[a]pyrene	0.34	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.32	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Dibenz(a,h)anthracene	0.13	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Benzo[g,h,i]perylene	0.54	H	0.067	0.067	ug/Filter	3.33		8270D SIM	Total/NA
Silver	0.62		0.20	0.0032	ug/Filter		1	6020A	Total/NA
Aluminum	1300		8.0	0.30	ug/Filter		1	6020A	Total/NA
Arsenic	4.5	B	0.40	0.00060	ug/Filter		2	6020A	Total/NA
Barium	97		10	0.030	ug/Filter		1	6020A	Total/NA
Beryllium	0.084	J	0.20	0.013	ug/Filter		1	6020A	Total/NA
Calcium	15000		100	0.86	ug/Filter		1	6020A	Total/NA
Cadmium	5.8		0.20	0.0047	ug/Filter		1	6020A	Total/NA
Cobalt	1.1		1.0	0.0059	ug/Filter		1	6020A	Total/NA
Chromium	12		0.40	0.011	ug/Filter		1	6020A	Total/NA
Copper	110		2.0	0.010	ug/Filter		1	6020A	Total/NA
Iron	3500		20	0.40	ug/Filter		1	6020A	Total/NA
Potassium	2100		100	0.71	ug/Filter		1	6020A	Total/NA
Magnesium	2500		100	0.39	ug/Filter		1	6020A	Total/NA
Manganese	200		0.40	0.027	ug/Filter		1	6020A	Total/NA
Sodium	14000		1000	5.4	ug/Filter		10	6020A	Total/NA
Nickel	8.6		2.0	0.010	ug/Filter		1	6020A	Total/NA
Lead	210		2.0	0.028	ug/Filter		10	6020A	Total/NA
Antimony	3.1		2.0	0.20	ug/Filter		1	6020A	Total/NA
Selenium	1.3		0.40	0.032	ug/Filter		2	6020A	Total/NA
Thallium	0.060	J B	0.20	0.0016	ug/Filter		1	6020A	Total/NA
Vanadium	4.7		0.40	0.0070	ug/Filter		1	6020A	Total/NA
Zinc	3400		20	0.51	ug/Filter		10	6020A	Total/NA

Client Sample ID: 1407001-16

Lab Sample ID: 200-23277-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	0.063	H	0.040	0.040	ug/Filter		2	8270D SIM	Total/NA
2-Methylnaphthalene	0.040	H	0.040	0.040	ug/Filter		2	8270D SIM	Total/NA
Fluorene	0.059	H	0.040	0.040	ug/Filter		2	8270D SIM	Total/NA
Phenanthrene	0.40	H	0.040	0.040	ug/Filter		2	8270D SIM	Total/NA
Fluoranthene	0.34	H	0.040	0.040	ug/Filter		2	8270D SIM	Total/NA
Pyrene	0.31	H	0.040	0.040	ug/Filter		2	8270D SIM	Total/NA
Benzo[a]anthracene	0.24	H	0.040	0.040	ug/Filter		2	8270D SIM	Total/NA
Chrysene	0.60	H	0.040	0.040	ug/Filter		2	8270D SIM	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Burlington

Detection Summary

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Client Sample ID: 1407001-16 (Continued)

Lab Sample ID: 200-23277-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzo[b]fluoranthene	0.29	H	0.040	0.040	ug/Filter	2		8270D SIM	Total/NA
Benzo[k]fluoranthene	0.33	H	0.040	0.040	ug/Filter	2		8270D SIM	Total/NA
Benzo[e]pyrene	0.15	H	0.040	0.040	ug/Filter	2		8270D SIM	Total/NA
Benzo[a]pyrene	0.21	H	0.040	0.040	ug/Filter	2		8270D SIM	Total/NA
Perylene	0.066	H	0.040	0.040	ug/Filter	2		8270D SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.074	H	0.040	0.040	ug/Filter	2		8270D SIM	Total/NA
Benzo[g,h,i]perylene	0.075	H	0.040	0.040	ug/Filter	2		8270D SIM	Total/NA
Silver	0.018	J	0.20	0.0032	ug/Filter	1		6020A	Total/NA
Aluminum	38		8.0	0.30	ug/Filter	1		6020A	Total/NA
Arsenic	0.41	B	0.20	0.00030	ug/Filter	1		6020A	Total/NA
Barium	5.3	J	10	0.030	ug/Filter	1		6020A	Total/NA
Calcium	560		100	0.86	ug/Filter	1		6020A	Total/NA
Cadmium	1.2		0.20	0.0047	ug/Filter	1		6020A	Total/NA
Cobalt	0.036	J	1.0	0.0059	ug/Filter	1		6020A	Total/NA
Chromium	0.66		0.40	0.011	ug/Filter	1		6020A	Total/NA
Copper	6.4		2.0	0.010	ug/Filter	1		6020A	Total/NA
Iron	100		20	0.40	ug/Filter	1		6020A	Total/NA
Potassium	440		100	0.71	ug/Filter	1		6020A	Total/NA
Magnesium	100		100	0.39	ug/Filter	1		6020A	Total/NA
Manganese	9.7		0.40	0.027	ug/Filter	1		6020A	Total/NA
Sodium	380		100	0.54	ug/Filter	1		6020A	Total/NA
Nickel	0.32	J	2.0	0.010	ug/Filter	1		6020A	Total/NA
Lead	3.3		0.20	0.0028	ug/Filter	1		6020A	Total/NA
Antimony	0.49	J	2.0	0.20	ug/Filter	1		6020A	Total/NA
Selenium	0.29		0.20	0.016	ug/Filter	1		6020A	Total/NA
Thallium	0.056	J B	0.20	0.0016	ug/Filter	1		6020A	Total/NA
Vanadium	0.26	J	0.40	0.0070	ug/Filter	1		6020A	Total/NA
Zinc	86		2.0	0.051	ug/Filter	1		6020A	Total/NA

Client Sample ID: 1407004-01

Lab Sample ID: 200-23277-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	0.031	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
2-Methylnaphthalene	0.025	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Acenaphthene	0.36	H *	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Fluorene	0.13	H *	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Phenanthrene	0.068	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Benzo[b]fluoranthene	0.039	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Benzo[k]fluoranthene	0.026	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Naphthalene - RE	0.030	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
2-Methylnaphthalene - RE	0.024	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Acenaphthene - RE	0.38	H *	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Fluorene - RE	0.13	H *	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Phenanthrene - RE	0.068	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Benzo[b]fluoranthene - RE	0.051	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Benzo[k]fluoranthene - RE	0.029	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Aluminum	5.1	J	8.0	0.30	ug/Filter	1		6020A	Total/NA
Arsenic	0.014	J B	0.20	0.00030	ug/Filter	1		6020A	Total/NA
Barium	0.13	J	10	0.030	ug/Filter	1		6020A	Total/NA
Calcium	75	J	100	0.86	ug/Filter	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Burlington

Detection Summary

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Client Sample ID: 1407004-01 (Continued)

Lab Sample ID: 200-23277-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cadmium	1.9		0.20	0.0047	ug/Filter	1		6020A	Total/NA
Cobalt	0.0060	J	1.0	0.0059	ug/Filter	1		6020A	Total/NA
Chromium	0.36	J	0.40	0.011	ug/Filter	1		6020A	Total/NA
Copper	1.7	J	2.0	0.010	ug/Filter	1		6020A	Total/NA
Iron	40		20	0.40	ug/Filter	1		6020A	Total/NA
Potassium	33	J	100	0.71	ug/Filter	1		6020A	Total/NA
Magnesium	5.8	J	100	0.39	ug/Filter	1		6020A	Total/NA
Manganese	0.29	J	0.40	0.027	ug/Filter	1		6020A	Total/NA
Sodium	120		100	0.54	ug/Filter	1		6020A	Total/NA
Nickel	0.48	J	2.0	0.010	ug/Filter	1		6020A	Total/NA
Lead	0.24		0.20	0.0028	ug/Filter	1		6020A	Total/NA
Thallium	0.0062	J B	0.20	0.0016	ug/Filter	1		6020A	Total/NA
Vanadium	0.044	J	0.40	0.0070	ug/Filter	1		6020A	Total/NA
Zinc	21		2.0	0.051	ug/Filter	1		6020A	Total/NA

Client Sample ID: 1407004-02

Lab Sample ID: 200-23277-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Naphthalene	0.27	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
2-Methylnaphthalene	0.14	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
1-Methylnaphthalene	0.053	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Acenaphthene	0.32	H*	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Fluorene	0.062	H*	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Phenanthrene	0.063	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Benzo[a]pyrene	0.042	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Naphthalene - RE	0.27	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
2-Methylnaphthalene - RE	0.14	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
1-Methylnaphthalene - RE	0.053	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Acenaphthene - RE	0.32	H*	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Fluorene - RE	0.062	H*	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Phenanthrene - RE	0.068	H	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Benzo[e]pyrene - RE	0.030	H*	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Benzo[a]pyrene - RE	0.044	H*	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Dibenz(a,h)anthracene - RE	0.041	H*	0.020	0.020	ug/Filter	1		8270D SIM	Total/NA
Aluminum	1.3	J	8.0	0.30	ug/Filter	1		6020A	Total/NA
Arsenic	0.029	J B	0.20	0.00030	ug/Filter	1		6020A	Total/NA
Barium	0.089	J	10	0.030	ug/Filter	1		6020A	Total/NA
Calcium	150		100	0.86	ug/Filter	1		6020A	Total/NA
Cadmium	3.0		0.20	0.0047	ug/Filter	1		6020A	Total/NA
Cobalt	0.030	J	1.0	0.0059	ug/Filter	1		6020A	Total/NA
Chromium	0.073	J	0.40	0.011	ug/Filter	1		6020A	Total/NA
Copper	1.3	J	2.0	0.010	ug/Filter	1		6020A	Total/NA
Iron	14	J	20	0.40	ug/Filter	1		6020A	Total/NA
Potassium	16	J	100	0.71	ug/Filter	1		6020A	Total/NA
Magnesium	19	J	100	0.39	ug/Filter	1		6020A	Total/NA
Manganese	0.25	J	0.40	0.027	ug/Filter	1		6020A	Total/NA
Sodium	410		100	0.54	ug/Filter	1		6020A	Total/NA
Nickel	0.23	J	2.0	0.010	ug/Filter	1		6020A	Total/NA
Lead	0.35		0.20	0.0028	ug/Filter	1		6020A	Total/NA
Antimony	1.6	J	2.0	0.20	ug/Filter	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Burlington

Detection Summary

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Client Sample ID: 1407004-02 (Continued)

Lab Sample ID: 200-23277-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Thallium	0.014	J B	0.20	0.0016	ug/Filter	1		6020A	Total/NA
Vanadium	0.045	J	0.40	0.0070	ug/Filter	1		6020A	Total/NA
Zinc	33		2.0	0.051	ug/Filter	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Burlington

Client Sample Results

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Client Sample ID: 1407001-15

Lab Sample ID: 200-23277-1

Date Collected: 07/01/14 14:16

Matrix: Filter

Date Received: 07/22/14 08:55

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.20	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
2-Methylnaphthalene	0.22	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
1-Methylnaphthalene	0.093	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Acenaphthylene	ND	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Acenaphthene	ND	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Fluorene	0.094	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Phenanthrene	2.0	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Anthracene	ND	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Fluoranthene	1.4	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Pyrene	1.3	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Benzo[a]anthracene	0.35	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Chrysene	1.2	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Benzo[b]fluoranthene	1.3	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Benzo[k]fluoranthene	0.96	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Benzo[e]pyrene	1.2	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Benzo[a]pyrene	0.34	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Perylene	ND	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Indeno[1,2,3-cd]pyrene	0.32	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Dibenz(a,h)anthracene	0.13	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Benzo[g,h,i]perylene	0.54	H	0.067	0.067	ug/Filter		07/24/14 13:02	07/29/14 16:04	3.33
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Methylnaphthalene-d10	79		30 - 120				07/24/14 13:02	07/29/14 16:04	3.33
Fluorene-d10	64		30 - 130				07/24/14 13:02	07/29/14 16:04	3.33
Fluoranthene-d10	105		10 - 165				07/24/14 13:02	07/29/14 16:04	3.33
Benzo(a)pyrene-d12	77		20 - 130				07/24/14 13:02	07/29/14 16:04	3.33

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.62		0.20	0.0032	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Aluminum	1300		8.0	0.30	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Arsenic	4.5	B	0.40	0.00060	ug/Filter		07/25/14 15:30	07/29/14 20:04	2
Barium	97		10	0.030	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Beryllium	0.084	J	0.20	0.013	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Calcium	15000		100	0.86	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Cadmium	5.8		0.20	0.0047	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Cobalt	1.1		1.0	0.0059	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Chromium	12		0.40	0.011	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Copper	110		2.0	0.010	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Iron	3500		20	0.40	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Potassium	2100		100	0.71	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Magnesium	2500		100	0.39	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Manganese	200		0.40	0.027	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Sodium	14000		1000	5.4	ug/Filter		07/25/14 15:30	07/29/14 20:11	10
Nickel	8.6		2.0	0.010	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Lead	210		2.0	0.028	ug/Filter		07/25/14 15:30	07/29/14 20:11	10
Antimony	3.1		2.0	0.20	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Selenium	1.3		0.40	0.032	ug/Filter		07/25/14 15:30	07/29/14 20:04	2
Thallium	0.060	J B	0.20	0.0016	ug/Filter		07/25/14 15:30	07/28/14 17:06	1
Vanadium	4.7		0.40	0.0070	ug/Filter		07/25/14 15:30	07/28/14 17:06	1

TestAmerica Burlington

Client Sample Results

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Client Sample ID: 1407001-15

Lab Sample ID: 200-23277-1

Date Collected: 07/01/14 14:16

Matrix: Filter

Date Received: 07/22/14 08:55

Method: 6020A - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	3400		20	0.51	ug/Filter		07/25/14 15:30	07/29/14 20:11	10

Client Sample ID: 1407001-16

Lab Sample ID: 200-23277-2

Date Collected: 07/01/14 14:26

Matrix: Filter

Date Received: 07/22/14 08:55

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.063	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
2-Methylnaphthalene	0.040	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
1-Methylnaphthalene	ND	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Acenaphthylene	ND	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Acenaphthene	ND	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Fluorene	0.059	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Phenanthrene	0.40	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Anthracene	ND	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Fluoranthene	0.34	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Pyrene	0.31	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Benzo[a]anthracene	0.24	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Chrysene	0.60	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Benzo[b]fluoranthene	0.29	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Benzo[k]fluoranthene	0.33	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Benzo[e]pyrene	0.15	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Benzo[a]pyrene	0.21	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Perylene	0.066	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Indeno[1,2,3-cd]pyrene	0.074	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Dibenz(a,h)anthracene	ND	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Benzo[g,h,i]perylene	0.075	H	0.040	0.040	ug/Filter		07/24/14 13:02	07/29/14 18:38	2
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Methylnaphthalene-d10	76		30 - 120				07/24/14 13:02	07/29/14 18:38	2
Fluorene-d10	78		30 - 130				07/24/14 13:02	07/29/14 18:38	2
Fluoranthene-d10	87		10 - 165				07/24/14 13:02	07/29/14 18:38	2
Benzo(a)pyrene-d12	60		20 - 130				07/24/14 13:02	07/29/14 18:38	2

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.018	J	0.20	0.0032	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Aluminum	38		8.0	0.30	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Arsenic	0.41	B	0.20	0.00030	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Barium	5.3	J	10	0.030	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Beryllium	ND		0.20	0.013	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Calcium	560		100	0.86	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Cadmium	1.2		0.20	0.0047	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Cobalt	0.036	J	1.0	0.0059	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Chromium	0.66		0.40	0.011	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Copper	6.4		2.0	0.010	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Iron	100		20	0.40	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Potassium	440		100	0.71	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Magnesium	100		100	0.39	ug/Filter		07/25/14 15:30	07/28/14 17:13	1

TestAmerica Burlington

Client Sample Results

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Client Sample ID: 1407001-16

Lab Sample ID: 200-23277-2

Date Collected: 07/01/14 14:26

Matrix: Filter

Date Received: 07/22/14 08:55

Method: 6020A - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	9.7		0.40	0.027	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Sodium	380		100	0.54	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Nickel	0.32	J	2.0	0.010	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Lead	3.3		0.20	0.0028	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Antimony	0.49	J	2.0	0.20	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Selenium	0.29		0.20	0.016	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Thallium	0.056	J B	0.20	0.0016	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Vanadium	0.26	J	0.40	0.0070	ug/Filter		07/25/14 15:30	07/28/14 17:13	1
Zinc	86		2.0	0.051	ug/Filter		07/25/14 15:30	07/28/14 17:13	1

Client Sample ID: 1407004-01

Lab Sample ID: 200-23277-3

Date Collected: 07/09/14 08:15

Matrix: Filter

Date Received: 07/22/14 08:55

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.031	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
2-Methylnaphthalene	0.025	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
1-Methylnaphthalene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Acenaphthylene	ND	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Acenaphthene	0.36	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Fluorene	0.13	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Phenanthrene	0.068	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Anthracene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Fluoranthene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Benzo[a]anthracene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Chrysene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Benzo[b]fluoranthene	0.039	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Benzo[k]fluoranthene	0.026	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Benzo[e]pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Benzo[a]pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Perylene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Indeno[1,2,3-cd]pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Dibenz(a,h)anthracene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Benzo[g,h,i]perylene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Methylnaphthalene-d10	89		30 - 120				07/24/14 13:02	07/29/14 17:21	1
Fluorene-d10	34	*	30 - 130				07/24/14 13:02	07/29/14 17:21	1
Fluoranthene-d10	88		10 - 165				07/24/14 13:02	07/29/14 17:21	1
Benzo(a)pyrene-d12	93		20 - 130				07/24/14 13:02	07/29/14 17:21	1

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.030	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
2-Methylnaphthalene	0.024	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
1-Methylnaphthalene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Acenaphthylene	ND	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Acenaphthene	0.38	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1

TestAmerica Burlington

Client Sample Results

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Client Sample ID: 1407004-01

Lab Sample ID: 200-23277-3

Date Collected: 07/09/14 08:15

Matrix: Filter

Date Received: 07/22/14 08:55

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - RE (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluorene	0.13	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Phenanthrene	0.068	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Anthracene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Fluoranthene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Benzo[a]anthracene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Chrysene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Benzo[b]fluoranthene	0.051	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Benzo[k]fluoranthene	0.029	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Benzo[e]pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Benzo[a]pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Perylene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Indeno[1,2,3-cd]pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Dibenz(a,h)anthracene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Benzo[g,h,i]perylene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:16	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
2-Methylnaphthalene-d10	88		30 - 120				07/24/14 13:02	07/29/14 19:16	1
Fluorene-d10	35	*	30 - 130				07/24/14 13:02	07/29/14 19:16	1
Fluoranthene-d10	86		10 - 165				07/24/14 13:02	07/29/14 19:16	1
Benzo(a)pyrene-d12	99		20 - 130				07/24/14 13:02	07/29/14 19:16	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		0.20	0.0032	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Aluminum	5.1	J	8.0	0.30	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Arsenic	0.014	J B	0.20	0.00030	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Barium	0.13	J	10	0.030	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Beryllium	ND		0.20	0.013	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Calcium	75	J	100	0.86	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Cadmium	1.9		0.20	0.0047	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Cobalt	0.0060	J	1.0	0.0059	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Chromium	0.36	J	0.40	0.011	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Copper	1.7	J	2.0	0.010	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Iron	40		20	0.40	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Potassium	33	J	100	0.71	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Magnesium	5.8	J	100	0.39	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Manganese	0.29	J	0.40	0.027	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Sodium	120		100	0.54	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Nickel	0.48	J	2.0	0.010	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Lead	0.24		0.20	0.0028	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Antimony	ND		2.0	0.20	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Selenium	ND		0.20	0.016	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Thallium	0.0062	J B	0.20	0.0016	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Vanadium	0.044	J	0.40	0.0070	ug/Filter		07/25/14 15:30	07/28/14 17:20	1
Zinc	21		2.0	0.051	ug/Filter		07/25/14 15:30	07/28/14 17:20	1

TestAmerica Burlington

Client Sample Results

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Client Sample ID: 1407004-02

Lab Sample ID: 200-23277-4

Date Collected: 07/09/14 08:15

Matrix: Filter

Date Received: 07/22/14 08:55

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.27	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
2-Methylnaphthalene	0.14	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
1-Methylnaphthalene	0.053	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Acenaphthylene	ND	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Acenaphthene	0.32	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Fluorene	0.062	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Phenanthrene	0.063	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Anthracene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Fluoranthene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Benzo[a]anthracene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Chrysene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Benzo[b]fluoranthene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Benzo[k]fluoranthene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Benzo[e]pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Benzo[a]pyrene	0.042	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Perylene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Indeno[1,2,3-cd]pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Dibenz(a,h)anthracene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1
Benzo[g,h,i]perylene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 17:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene-d10	89		30 - 120	07/24/14 13:02	07/29/14 17:59	1
Fluorene-d10	42	*	30 - 130	07/24/14 13:02	07/29/14 17:59	1
Fluoranthene-d10	91		10 - 165	07/24/14 13:02	07/29/14 17:59	1
Benzo(a)pyrene-d12	96		20 - 130	07/24/14 13:02	07/29/14 17:59	1

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - RE

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	0.27	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
2-Methylnaphthalene	0.14	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
1-Methylnaphthalene	0.053	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Acenaphthylene	ND	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Acenaphthene	0.32	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Fluorene	0.062	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Phenanthrene	0.068	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Anthracene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Fluoranthene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Pyrene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Benzo[a]anthracene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Chrysene	ND	H	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Benzo[b]fluoranthene	ND	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Benzo[k]fluoranthene	ND	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Benzo[e]pyrene	0.030	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Benzo[a]pyrene	0.044	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Perylene	ND	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Indeno[1,2,3-cd]pyrene	ND	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Dibenz(a,h)anthracene	0.041	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1
Benzo[g,h,i]perylene	ND	H *	0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 19:55	1

TestAmerica Burlington

Client Sample Results

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Client Sample ID: 1407004-02

Lab Sample ID: 200-23277-4

Date Collected: 07/09/14 08:15

Matrix: Filter

Date Received: 07/22/14 08:55

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene-d10	89		30 - 120	07/24/14 13:02	07/29/14 19:55	1
Fluorene-d10	42	*	30 - 130	07/24/14 13:02	07/29/14 19:55	1
Fluoranthene-d10	82		10 - 165	07/24/14 13:02	07/29/14 19:55	1
Benzo(a)pyrene-d12	107	*	20 - 130	07/24/14 13:02	07/29/14 19:55	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		0.20	0.0032	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Aluminum	1.3	J	8.0	0.30	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Arsenic	0.029	J B	0.20	0.00030	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Barium	0.089	J	10	0.030	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Beryllium	ND		0.20	0.013	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Calcium	150		100	0.86	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Cadmium	3.0		0.20	0.0047	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Cobalt	0.030	J	1.0	0.0059	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Chromium	0.073	J	0.40	0.011	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Copper	1.3	J	2.0	0.010	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Iron	14	J	20	0.40	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Potassium	16	J	100	0.71	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Magnesium	19	J	100	0.39	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Manganese	0.25	J	0.40	0.027	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Sodium	410		100	0.54	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Nickel	0.23	J	2.0	0.010	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Lead	0.35		0.20	0.0028	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Antimony	1.6	J	2.0	0.20	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Selenium	ND		0.20	0.016	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Thallium	0.014	J B	0.20	0.0016	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Vanadium	0.045	J	0.40	0.0070	ug/Filter		07/25/14 15:30	07/28/14 17:27	1
Zinc	33		2.0	0.051	ug/Filter		07/25/14 15:30	07/28/14 17:27	1

Definitions/Glossary

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Qualifiers

GC/MS Semi VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
*	ISTD response or retention time outside acceptable limits

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

QC Association Summary

Client: Environmental Health & Engineering
 Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

GC/MS Semi VOA

Prep Batch: 75286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
200-23277-1	1407001-15	Total/NA	Filter	3550C	
200-23277-2	1407001-16	Total/NA	Filter	3550C	
200-23277-3	1407004-01	Total/NA	Filter	3550C	
200-23277-3 - RE	1407004-01	Total/NA	Filter	3550C	
200-23277-4	1407004-02	Total/NA	Filter	3550C	
200-23277-4 - RE	1407004-02	Total/NA	Filter	3550C	
LCS 200-75286/2-A	Lab Control Sample	Total/NA	Filter	3550C	
MB 200-75286/1-A	Method Blank	Total/NA	Filter	3550C	

Analysis Batch: 75435

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
200-23277-1	1407001-15	Total/NA	Filter	8270D SIM	75286
200-23277-2	1407001-16	Total/NA	Filter	8270D SIM	75286
200-23277-3	1407004-01	Total/NA	Filter	8270D SIM	75286
200-23277-3 - RE	1407004-01	Total/NA	Filter	8270D SIM	75286
200-23277-4	1407004-02	Total/NA	Filter	8270D SIM	75286
200-23277-4 - RE	1407004-02	Total/NA	Filter	8270D SIM	75286
LCS 200-75286/2-A	Lab Control Sample	Total/NA	Filter	8270D SIM	75286
MB 200-75286/1-A	Method Blank	Total/NA	Filter	8270D SIM	75286

Metals

Prep Batch: 75341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
200-23277-1	1407001-15	Total/NA	Filter	3050B	
200-23277-2	1407001-16	Total/NA	Filter	3050B	
200-23277-3	1407004-01	Total/NA	Filter	3050B	
200-23277-4	1407004-02	Total/NA	Filter	3050B	
LCS 200-75341/2-A	Lab Control Sample	Total/NA	Filter	3050B	
MB 200-75341/1-A	Method Blank	Total/NA	Filter	3050B	

Analysis Batch: 75431

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
200-23277-1	1407001-15	Total/NA	Filter	6020A	75341
200-23277-2	1407001-16	Total/NA	Filter	6020A	75341
200-23277-3	1407004-01	Total/NA	Filter	6020A	75341
200-23277-4	1407004-02	Total/NA	Filter	6020A	75341
LCS 200-75341/2-A	Lab Control Sample	Total/NA	Filter	6020A	75341
MB 200-75341/1-A	Method Blank	Total/NA	Filter	6020A	75341

Analysis Batch: 75475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
200-23277-1	1407001-15	Total/NA	Filter	6020A	75341
200-23277-1	1407001-15	Total/NA	Filter	6020A	75341

Surrogate Summary

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Filter

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		MND10 (30-120)	FD10 (30-130)	FLN (10-165)	BAP (20-130)
200-23277-1	1407001-15	79	64	105	77
200-23277-2	1407001-16	76	78	87	60
200-23277-3	1407004-01	89	34 *	88	93
200-23277-3 - RE	1407004-01	88	35 *	86	99
200-23277-4	1407004-02	89	42 *	91	96
200-23277-4 - RE	1407004-02	89	42 *	82	107 *
LCS 200-75286/2-A	Lab Control Sample	80	84	84	80
MB 200-75286/1-A	Method Blank	82	86	90	81

Surrogate Legend

MND10 = 2-Methylnaphthalene-d10

FD10 = Fluorene-d10

FLN = Fluoranthene-d10

BAP = Benzo(a)pyrene-d12

QC Sample Results

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 200-75286/1-A

Matrix: Filter

Analysis Batch: 75435

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 75286

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Naphthalene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
2-Methylnaphthalene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
1-Methylnaphthalene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Acenaphthylene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Acenaphthene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Fluorene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Phenanthrene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Anthracene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Fluoranthene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Pyrene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Benzo[a]anthracene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Chrysene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Benzo[b]fluoranthene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Benzo[k]fluoranthene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Benzo[e]pyrene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Benzo[a]pyrene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Perylene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Indeno[1,2,3-cd]pyrene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Dibenz(a,h)anthracene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1
Benzo[g,h,i]perylene	ND		0.020	0.020	ug/Filter		07/24/14 13:02	07/29/14 15:25	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Methylnaphthalene-d10	82		30 - 120	07/24/14 13:02	07/29/14 15:25	1
Fluorene-d10	86		30 - 130	07/24/14 13:02	07/29/14 15:25	1
Fluoranthene-d10	90		10 - 165	07/24/14 13:02	07/29/14 15:25	1
Benzo(a)pyrene-d12	81		20 - 130	07/24/14 13:02	07/29/14 15:25	1

Lab Sample ID: LCS 200-75286/2-A

Matrix: Filter

Analysis Batch: 75435

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 75286

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Naphthalene	0.400	0.383		ug/Filter		96	30 - 130
2-Methylnaphthalene	0.400	0.320		ug/Filter		80	30 - 135
1-Methylnaphthalene	0.400	0.321		ug/Filter		80	30 - 135
Acenaphthylene	0.400	0.395		ug/Filter		99	30 - 130
Acenaphthene	0.400	0.372		ug/Filter		93	30 - 130
Fluorene	0.400	0.360		ug/Filter		90	35 - 130
Phenanthrene	0.400	0.355		ug/Filter		89	35 - 130
Anthracene	0.400	0.345		ug/Filter		86	35 - 135
Fluoranthene	0.400	0.346		ug/Filter		87	35 - 140
Pyrene	0.400	0.431		ug/Filter		108	20 - 155
Benzo[a]anthracene	0.400	0.375		ug/Filter		94	35 - 150
Chrysene	0.400	0.382		ug/Filter		96	40 - 125
Benzo[b]fluoranthene	0.400	0.384		ug/Filter		96	40 - 135
Benzo[k]fluoranthene	0.400	0.407		ug/Filter		102	35 - 130
Benzo[e]pyrene	0.400	0.343		ug/Filter		86	40 - 125
Benzo[a]pyrene	0.400	0.353		ug/Filter		88	35 - 135

TestAmerica Burlington

QC Sample Results

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 200-75286/2-A

Matrix: Filter

Analysis Batch: 75435

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 75286

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perylene	0.400	0.329		ug/Filter		82	35 - 125
Indeno[1,2,3-cd]pyrene	0.400	0.322		ug/Filter		81	20 - 140
Dibenz(a,h)anthracene	0.400	0.307		ug/Filter		77	20 - 145
Benzo[g,h,i]perylene	0.400	0.338		ug/Filter		84	20 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Methylnaphthalene-d10	80		30 - 120
Fluorene-d10	84		30 - 130
Fluoranthene-d10	84		10 - 165
Benzo(a)pyrene-d12	80		20 - 130

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 200-75341/1-A

Matrix: Filter

Analysis Batch: 75431

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 75341

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		200	3.2	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Aluminum	ND		8000	300	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Arsenic	7.20	J	200	0.30	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Barium	ND		10000	30	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Beryllium	ND		200	13	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Calcium	ND		100000	860	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Cadmium	ND		200	4.7	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Cobalt	ND		1000	5.9	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Chromium	ND		400	11	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Copper	ND		2000	10	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Iron	ND		20000	400	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Potassium	ND		100000	710	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Magnesium	ND		100000	390	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Manganese	ND		400	27	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Sodium	ND		100000	540	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Nickel	ND		2000	10	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Lead	ND		200	2.8	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Antimony	ND		2000	200	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Selenium	ND		200	16	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Thallium	7.50	J	200	1.6	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Vanadium	ND		400	7.0	ug/Filter		07/24/14 18:00	07/28/14 16:52	1
Zinc	ND		2000	51	ug/Filter		07/24/14 18:00	07/28/14 16:52	1

Lab Sample ID: LCS 200-75341/2-A

Matrix: Filter

Analysis Batch: 75431

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 75341

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silver	2000	2040		ug/Filter		102	80 - 120
Aluminum	80000	80900		ug/Filter		101	80 - 120

TestAmerica Burlington

QC Sample Results

Client: Environmental Health & Engineering
 Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 200-75341/2-A

Matrix: Filter

Analysis Batch: 75431

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 75341

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	2000	1910		ug/Filter		96	80 - 120
Barium	50000	50700		ug/Filter		101	80 - 120
Beryllium	2000	2140		ug/Filter		107	80 - 120
Calcium	1000000	940000		ug/Filter		94	80 - 120
Cadmium	2000	2090		ug/Filter		105	80 - 120
Cobalt	10000	10100		ug/Filter		101	80 - 120
Chromium	4000	4040		ug/Filter		101	80 - 120
Copper	10000	10500		ug/Filter		105	80 - 120
Iron	200000	206000		ug/Filter		103	80 - 120
Potassium	1000000	1080000		ug/Filter		108	80 - 120
Magnesium	1000000	1080000		ug/Filter		108	80 - 120
Manganese	4000	4000		ug/Filter		100	80 - 120
Sodium	1000000	1050000		ug/Filter		105	80 - 120
Nickel	10000	10300		ug/Filter		103	80 - 120
Lead	2000	1960		ug/Filter		98	80 - 120
Antimony	10000	10200		ug/Filter		102	80 - 120
Selenium	2000	1990		ug/Filter		100	80 - 120
Thallium	2000	1930		ug/Filter		97	80 - 120
Vanadium	4000	3850		ug/Filter		96	80 - 120
Zinc	10000	10800		ug/Filter		108	80 - 120

00191
00200

FedEx Express Package US Airbill
Tracking Number 8055 4694 8899

1 From
Date 7/31/14
Sender's Name Madison Allen Jr Phone _____
Company _____
Address _____
City _____ State _____ ZIP _____
Dept./Floor/Suite/Room _____

2 Your Internal Billing Reference 17251
3 To
Recipient's Name Stephanie Sanders Phone 802 660-1199
Company Top America
Address 90 Community Drive Ste H Dept./Floor/Suite/Room _____
We cannot deliver to P.O. boxes or P.O. ZIP codes.
Address Use this line for the HOLD location address or for continuation of your shipping address.
City South Burlington State VT ZIP 05403

HOLD Weekday
FedEx Home Delivery address
REQUIRED. NOT available for
FedEx First Overnight.
HOLD Saturday
FedEx Home Delivery address
REQUIRED. Available ONLY for
FedEx Priority Overnight and
FedEx 2Day to select locations.



8055 4694 8899

fedex.com 1.800.GoFedEx 1.800.463.3339

Form ID No. **0215**
4 Express Package Service *To most locations.
NOTE: Service order has changed. Please select carefully.
Packages up to 150 lbs.
for packages over 150 lbs., use the
FedEx Express Freight US Airbill.

Next Business Day
FedEx First Overnight
Earliest next business morning delivery to select
Monday through Friday. Delivery is guaranteed
Monday unless SATURDAY Delivery is selected.
FedEx Priority Overnight
Next business morning - Friday shipments will be
delivered on Monday unless SATURDAY Delivery
is selected.
FedEx Standard Overnight
Next business afternoon.*
Saturday Delivery NOT available.
2 or 3 Business Days
FedEx 2Day AM
Second business morning.*
Saturday Delivery NOT available.
FedEx 2Day
Second business afternoon.* Thursday shipments
will be delivered on Monday unless SATURDAY
Delivery is selected.
FedEx Express Saver
Third business day.*
Saturday Delivery NOT available.

5 Packaging *Declared value limit \$500.
FedEx Envelope* FedEx Pak* FedEx Box Tube Other

6 Special Handling and Delivery Signature Options
SATURDAY Delivery
Not available for FedEx Standard Overnight, FedEx 2Day AM, or FedEx Express Saver.
No Signature Required
Package may be left without
obtaining a signature for delivery.
Direct Signature
Someone at recipient's address
may sign for delivery. Fee applies.
Indirect Signature
If no one is available at recipient's
address, a signature may be obtained for
residential deliveries only. Fee applies.

Does this shipment contain dangerous goods?
No Yes
As per attached
Shipper's Declaration
not required.
Dry Ice
Dry Ice, 3, UN 1845
Cargo Aircraft Only
Dangerous goods packaging must be shipped in FedEx packaging
or placed in a FedEx Express Drop Box.

7 Payment Bill to:
Sender's Acct. No. Recipient Third Party Credit Card Cash/Check
Enter FedEx Acct. No. or Credit Card No. below.
Total Packages _____ Total Weight _____ lbs.
Credit Card Auth. **6111**

Your liability is limited to US\$100 unless you declare a higher value. See the current FedEx Service Guide for details.

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Login Sample Receipt Checklist

Client: Environmental Health & Engineering

Job Number: 200-23277-1

Login Number: 23277

List Source: TestAmerica Burlington

List Number: 1

Creator: Gagne, Eric M

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	NO SEALS
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.2°C. IR GUN ID 181. CF = -0.2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	NO COLLECTION TIME OR DATE ON CONTAINER LABELS.
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Certification Summary

Client: Environmental Health & Engineering
Project/Site: Filter Sample

TestAmerica Job ID: 200-23277-1

Laboratory: TestAmerica Burlington

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Connecticut	State Program	1	PH-0751	09-30-15
DE Haz. Subst. Cleanup Act (HSCA)	State Program	3	NA	02-13-15
Florida	NELAP	4	E87467	06-30-15
L-A-B	DoD ELAP		L2336	02-26-17
Maine	State Program	1	VT00008	04-17-15
Minnesota	NELAP	5	050-999-436	12-31-14
New Hampshire	NELAP	1	2006	12-18-14
New Jersey	NELAP	2	VT972	06-30-15
New York	NELAP	2	10391	03-31-15
Pennsylvania	NELAP	3	68-00489	04-30-15
Rhode Island	State Program	1	LAO00298	12-30-14
US Fish & Wildlife	Federal		LE-058448-0	02-28-15
USDA	Federal		P330-11-00093	10-28-16
Vermont	State Program	1	VT-4000	12-31-14
Virginia	NELAP	3	460209	12-14-14