APPENDIX A

NOVER-ARMSTRONG ASSOCIATES, INC.

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November 16, 2011

Richard K. Quateman, LSP, CHMM
Principal Scientist
Kleinfelder ▪ S E A Consultants
215 First Street
Cambridge, MA 02142

RE: Initial Hazardous Materials Survey
MBTA Tire Maintenance Facility
21 Water Street
Cambridge, Massachusetts
NAA File P2814
K/SEA Reference No. 2011035.01-A

Dear Mr. Quateman,

Nover-Armstrong Associates, Inc. (Nover-Armstrong) has completed an Initial Hazardous Materials Survey of the MBTA Tire Maintenance Facility located at 21 Water Street in Cambridge, Massachusetts (the site).

The MBTA Tire Maintenance Facility consists of approximately 11,914 square feet. Nover-Armstrong understands the Facility is scheduled for future demolition as part of the MBTA's Green Line Extension (GLX) project. Our survey findings are presented below.

1.0 Lead Based Paint (LBP)

Mel Blackman, Master Lead Inspector, conducted an OSHA Pre-Renovation Lead-Based Paint Survey on building materials (using XRF testing technology). Materials tested included accessible interior and exterior walls, floors, doors and trim, windows and trim, ceilings, structural steel, floor and wall ceramic tiles, lockers, stall dividers, window bars, staircase components, cabinets, lally columns, radiators, baseboards, pipes and overhead door systems.

As detailed in the attached inspection report, our survey found materials containing lead equal to or greater than >1.0 mg/cm^2 to include yellow floor paint and white metal window grates. These painted materials were observed to be in good condition.

In areas where future demolition is to occur and lead is present, the demolition debris waste stream should be analyzed for Lead using Toxicity Characteristic Leaching Procedure (TCLP) methodologies prior to waste segregation. Please refer to Attachment A -*OSHA Pre-Renovation Lead-Based Paint Survey Report,* dated November 2, 2011.

2.0 Asbestos Containing Materials (ACMs)

An initial survey was conducted to identify ACMs associated with the MBTA Tire Maintenance Facility. The survey was conducted in accordance with Massachusetts Department of Labor and Workforce Development (DLWD) – The Removal, Containment and Encapsulation of Asbestos Regulations – 453 CMR 6.00 and other applicable federal asbestos regulations. The survey was conducted by Marylou Armstrong who is certified as an Asbestos Inspector (License #AI041371) pursuant to Title II of the Toxic Substance Control Act (TSCA), 15, U.S.C. 2646. See Appendix E for license / certification details.

The Facility is constructed of concrete block walls, concrete slab floor, steel I-beams and steel ceiling. Within the western end of the structure (interior offices, break room, hallways and bath rooms), Nover-Armstrong observed carpet over concrete, carpet over wood, tile over wood, panel walls over dry wall, suspended ceiling tiles. Visual inspection revealed mortar, concrete, caulking, pipe insulation, dry wall, cove base, ceiling materials, vinyl floor tile (VFT), mastic, stair treads, ceramic tile and roofing materials that were considered suspect ACMs. Building materials considered suspect of containing asbestos were observed to be in poor to good condition with areas of isolated damage, as noted in Table 1 on the following page.

Accessible areas were assessed, inspected and / or sampled. Materials hidden or not accessible were evaluated and / or sampled within reasonable access limitations. Prior to obtaining samples, distinct homogeneous sampling areas and specific sampling sites were determined. A homogeneous sampling area is described as material that is identical in color, appearance and having the same installation date. Miscellaneous materials such as ceiling tile and vinyl floor tile are classified as homogeneous areas, unless otherwise noted. Suspect ACMs are classified as friable or non-friable material. Friable material may be crumpled, pulverized or reduced to powder with hand pressure. Friable materials are more hazardous than non-friable materials because they can readily release airborne asbestos fibers.

Bulk samples of suspect materials were collected into sealed plastic bags and hand delivered to SciLab Boston, Inc. (SciLab) in Weymouth, Massachusetts for analysis. Bulk samples were analyzed by Polarized Light Microscopy (PLM) utilizing dispersion staining (DS) techniques in accordance with EPA Method 600/M4-28-020. A total of forty (40) bulk samples were submitted for analysis. Table 1 below details analytical results. The analytical laboratory report and corresponding chain of custody (COC) forms are included in Attachment C of this report.

Table 1 – 11/2011 ACM Analysis Summary

SAMPLE ID	ANALYTICAL RESULTS	DESCRIPTION	LOCATION	CONDITION
AS-1.1	NAD	concrete block wall	shop area	fair to good
AS-1.2	NAD	concrete block wall	shop area	fair to good
AS-1.3	NAD	concrete block wall	shop area	fair to good
AS-1.4	NAD	concrete block wall	shop area	fair to good
AS-2.1	NAD	4” pipe insulation & wrap	utility room	fair to good
AS-2.2	NAD	4” pipe insulation & wrap	utility room	fair to good
AS-2.3	NAD	4” pipe insulation & wrap	utility room	fair to good
AS-3.1	NAD	dry wall	storage room	good
AS-3.2	NAD	dry wall	storage room	good
AS-3.3	NAD	dry wall	storage room	good
AS-4.1	NAD	wall caulking	shop area	fair, isolated damage
AS-4.1	NAD	horse hair plaster	shop area	fair, isolated damage
AS-4.2	NAD	wall caulking	shop area	fair, isolated damage
AS-4.2	NAD	horse hair plaster	shop area	fair, isolated damage
AS-5.1	NAD	dry wall	break room	fair, isolated damage
AS-5.2	NAD	dry wall	break room	fair, isolated damage
AS-5.3	NAD	dry wall	break room	fair, isolated damage
AS-6.1	NAD	black cove base	break room	good
AS-6.2	NAD	black cove base	break room	good
AS-6.3	NAD	black cove base	break room	good
AS-7.1	NAD	suspended ceiling tile	break room	fair, isolated damage
AS-7.2	NAD	suspended ceiling tile	break room	fair, isolated damage
AS-7.3	NAD	suspended ceiling tile	1st floor offices	fair, isolated damage
AS-7.4	NAD	suspended ceiling tile	2nd floor hallway	fair, isolated damage
AS-8.1	NAD	12” VFT – light grey & blue	break room	fair
AS-8.1	NAD	mastic associated AS-8.1 VFT	break room	fair
AS-8.2	NAD	12” VFT – light grey & blue	break room	fair
AS-8.2	NAD	mastic associated AS-8.1 VFT	break room	fair
AS-8.3	NAD	12” VFT – light grey & blue	break room	fair
AS-8.3	NAD	mastic associated AS-8.1 VFT	break room	fair
AS-9.1	NAD	black stairway tread – rubber	1st to 2nd floor offices	good
AS-9.2	NAD	black stairway tread – rubber	1st to 2nd floor offices	good
AS-9.3	NAD	black stairway tread – rubber	1st to 2nd floor offices	good
AS-10.1	**3% Chrysotile**	**9” VFT – grey**	**rear hallway**	**poor, damaged**
AS-10.1	NAD	mastic associated AS-8.1 VFT	rear hallway	poor, damaged
AS-10.2	**NA/PS**	**9” VFT – grey**	**rear hallway**	**poor, damaged**
AS-10.2	NAD	mastic associated AS-8.1 VFT	rear hallway	poor, damaged
AS-10.3	**NA/PS**	**9” VFT – grey**	**rear hallway**	**poor, damaged**
AS-10.3	NAD	mastic associated AS-8.1 VFT	rear hallway	poor, damaged
AS-11.1	NAD	1” ceramic tile	2nd floor ladies room	fair to poor
AS-11.1	NAD	caulking / grout	2nd floor ladies room	fair to poor
AS-11.2	NAD	1” ceramic tile	2nd floor ladies room	fair to poor
AS-11.2	NAD	caulking / grout	2nd floor ladies room	fair to poor
AS-11.3	NAD	1” ceramic tile	2nd floor ladies room	fair, isolated damage
AS-11.3	NAD	caulking / grout	2nd floor ladies room	fair, isolated damage
AS-12.1	NAD	exterior window caulking	south side of building	fair, weathered
AS-12.2	NAD	exterior window caulking	west side of building	fair, weathered
AS-12.3	NAD	exterior window caulking	north side of building	fair, weathered
AS-13.1	NAD	mortar assoc. with concrete wall	shop area	fair to good
AS-13.2	NAD	mortar assoc. with concrete wall	shop area	fair to good
Roof-1	NAD	gravel, tar, paper, membrane	south side of roof	good

Notes: NAD = No Asbestos Detected NA/PS = Not Applicable/Positive Stop VFT = Vinyl Floor Tile

Bulk material analytical results revealed evidence of friable ACM in the form of 9" VFT in the rear hallway (adjacent to the Warranty Department doorway). There is less than 30 square feet of this 9" VFT.

3.0 Polychlorinated Biphenyls (PCBs)

Building materials were inspected for potential presence of PCBs. Visual inspection revealed mortar, floor caulking and painted caulking that were considered potential PCB sources. Building materials were observed to be in poor to good condition, with areas of isolated damage. The building material samples were submitted to Alpha Analytical, Inc. (Alpha) and analyzed for PCBs via EPA Method 3540C (Soxhlet Extraction Method).

The attached Table 2 – Summary of 11/02/2011 Building Materials Analytical Results (for PCBs) summarizes analytical findings. Concentrations of PCBs were detected in all window caulking samples and one wall caulking sample. PCB concentrations ranged from 110,000 parts per million (ppm) to 993,000 ppm. Lower PCB concentrations ranging from 0.172 ppm to 40.4 ppm were detected in floor caulking and mortar associated with concrete walls. Review of the analytical laboratory report revealed that 16 ppm PCBs was also detected in the Method Blank sample. Nover-Armstrong contacted Glenn Breland of Alpha relative to the detection of PCBs in the Method Blank. Mr. Breland stated that the Method Blank was run as part of the sample batch. During the soxhlet extraction and / or blow down process, the Method Blank (and potentially some of the building material samples) was contaminated from the window caulking samples containing very high PCB concentrations run at the beginning of the batch. Therefore, samples containing less than 16 ppm PCBs, including FLOOR-1, FLOOR-3, FLOOR-4, WALL-1 AND WALL-4, may not contain PCBs or may have concentrations less than the concentrations reported by Alpha in their laboratory report.

4.0 Conclusions and Recommendations

Lead-Based Paint

As detailed in the attached inspection report, building materials containing lead equal to or greater than >1.0 mg/cm^2 were minimal, including yellow floor paint and white metal window grates. These painted materials were observed to be in good condition. During future demolition activities, building materials containing lead will require disposal. The demolition debris waste stream should be analyzed for Lead using TCLP methodologies prior to waste segregation to determine whether the waste stream can be disposed of as construction debris or as a TCLP waste.

ACMs

During future demolition activities, building materials (9" VFT) containing asbestos will require disposal. ACM-containing materials should be managed and disposed of in accordance with applicable MassDEP regulations.

Nover-Armstrong understands the Facility is scheduled for demolition in the future, however, the Facility is currently occupied and operating as a tire maintenance facility. Therefore, only accessible areas were assessed, inspected and sampled. Materials hidden or not accessible were evaluated and / or sampled within reasonable access limitations.

During future demolition activities, additional inaccessible building materials suspect of containing asbestos may be identified. If so, said materials should be sampled and analyzed by a certified asbestos inspector prior to disturbance or removal.

PCBs

Analytical results revealed window caulking containing PCB concentrations. The caulking materials were observed to be consistent and homogeneous. There are forty (40) windows throughout the Facility. Additional assessment of building materials and potentially ground surfaces surrounding the windows will likely be required, per TCSA requirements. During future demolition activities, caulking materials should be appropriately managed and disposed of under applicable TSCA regulations.

One caulking sample obtained from the interior southern wall (in the lower section that is painted green) contained PCB concentrations. Additional survey should be conducted throughout the painted sections of the concrete block wall to assess for the presence of caulking vs. mortar. If identified, additional sampling & analysis should be conducted.

Due to the detection of PCBs within the Method Blank sample, Nover-Armstrong recommends re-sampling and analysis of the building materials with PCB concentrations less than 16 ppm to determine / confirm the presence of PCBs.

Sincerely,

Nover-Armstrong Associates, Inc.

Marylou Armstrong, LSP
Principal

Attachments:

A - Table 2 – Summary of 11/02/2011 Building Materials Analytical Results (for PCBs)
B - OSHA Pre-Demolition Lead-Based Paint Survey, Report, dated November 2, 2011
C - AmeriSci Asbestos Analytical Laboratory Report, dated November 11, 2011
D - Asbestos Inspector Certification, Photographs & Notes
E - Alpha Analytical Report (PCBs), dated November 11, 2011

Attachment A

Table 2 – Summary of 11/02/2011 Building Materials Analytical Results (for PCBs)

TABLE 2 - Summary of 11/02/2011 Building Materials Analytical Results (PCBs)

SAMPLE ID	**FLOOR-1**	**FLOOR-2**	**FLOOR-3**	**FLOOR-4**	**WALL-1**	**WALL-2**	**WALL-3**	**WALL-4**	**WINDOW-1**	**WINDOW-2**	**WINDOW-3**	**Method Blank**
SAMPLE MATERIAL	**caulking**	**caulking**	**caulking**	**caulking**	**painted mortar**	**mortar**	**painted caulking**	**mortar**	**caulking**	**caulking**	**caulking**	
SAMPLING DATE	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	
LAB SAMPLE ID	L1118311-08	L1118311-09	L1118311-10	L1118311-11	L1118311-01	L1118311-02	L1118311-03	L1118311-04	L1118311-05	L1118311-06	L1118311-07	
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Polychlorinated Biphenyls (PCBs)												
Aroclor 1016	BRL(<0.104)	BRL(<1.42)	BRL(<0.0621)	BRL(<0.14)	BRL(<0.739)	BRL(<0.528)	BRL(<19300)	BRL(<0.708)	BRL(<56000)	BRL(<12500)	BRL(<48400)	BRL(<0.0562)
Aroclor 1221	BRL(<0.104)	BRL(<1.42)	BRL(<0.0621)	BRL(<0.14)	BRL(<0.739)	BRL(<0.528)	BRL(<19300)	BRL(<0.708)	BRL(<56000)	BRL(<12500)	BRL(<48400)	BRL(<0.0562)
Aroclor 1232	BRL(<0.104)	BRL(<1.42)	BRL(<0.0621)	BRL(<0.14)	BRL(<0.739)	BRL(<0.528)	BRL(<19300)	BRL(<0.708)	BRL(<56000)	BRL(<12500)	BRL(<48400)	BRL(<0.0562)
Aroclor 1242	BRL(<0.104)	BRL(<1.42)	BRL(<0.0621)	BRL(<0.14)	BRL(<0.739)	BRL(<0.528)	BRL(<19300)	BRL(<0.708)	BRL(<56000)	BRL(<12500)	BRL(<48400)	BRL(<0.0562)
Aroclor 1248	BRL(<0.0694)	BRL(<0.943)	BRL(<0.0414)	BRL(<0.0934)	BRL(<0.493)	BRL(<0.352)	BRL(<12900)	BRL(<0.472)	BRL(<37300)	BRL(<8330)	BRL(<32200)	BRL(<0.0374)
Aroclor 1254	**0.313**	BRL(<1.42)	**0.172**	**0.665**	BRL(<0.739)	BRL(<0.528)	BRL(<19300)	BRL(<0.708)	BRL(<56000)	BRL(<12500)	BRL(<48400)	BRL(<0.0562)
Aroclor 1260	**0.394**	**40.4**	**0.265**	**0.336**	**1.24**	BRL(<0.352)	**191,000**	**11.4**	**993,000**	**110,000**	**620,000**	**16.2**
Aroclor 1262	BRL(<0.0347)	BRL(<0.472)	BRL(<0.0207)	BRL(<0.0467)	BRL(<0.246)	BRL(<0.176)	BRL(<6440)	BRL(<0.236)	BRL(<18600)	BRL(<4170)	BRL(<16100)	BRL(<0.0187)
Aroclor 1268	BRL(<0.0347)	BRL(<0.472)	BRL(<0.0207)	BRL(<0.0467)	BRL(<0.246)	BRL(<0.176)	BRL(<6440)	BRL(<0.236)	BRL(<18600)	BRL(<4170)	BRL(<16100)	BRL(<0.0187)

Notes: Concentrations presented in mg/kg - milligrams per kilogram - parts per million
BRL - Below laboratory reporting limit

Attachment B

OSHA Pre-Demolition Lead-Based Paint Survey, Report, dated November 2, 2011

MEL BLACKMAN
MASTER LEAD INSPECTOR

OSHA PRE-DEMOLITION LEAD BASED PAINT SURVEY

Project:

MBTA Tire Maintenance Shop
21 Water Street
Cambridge, MA

Date:

November 2, 2011

Prepared For:

NOVER-ARMSTRONG ASSOCIATES, INC.
124 MAIN STREET, UNIT 2GG
CARVER, MA 02330
508-866-8383

Prepared & Inspected By:

MEL BLACKMAN
P O BOX 358
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781-820-8611

MEL BLACKMAN
MASTER LEAD INSPECTOR
P.O. BOX 358 - STONEHAM, MA. 02180
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1 Executive Summary:

Mel Blackman was retained by Nover-Armstrong Associates, Inc. of Carver, MA, to conduct an OSHA pre-demolition lead paint survey located at **21 Water Street,** the **MBTA Tire Maintenance Shop** in **Cambridge, Massachusetts** on **November 2, 2011**. The survey included representative sampling of interior and exterior painted surfaces.

The intent of the lead paint survey was to identify building surfaces coated with lead based paint, utilizing XRF testing technology. The information collected, as a result of the testing, can be used to ensure OSHA compliance relative to worker exposure and proper disposal of renovation or demolition debris.

Very few of the interior surfaces were found to have high concentrations of lead based paint. Components coated with high concentrations of lead based paint include specific:

- Metal windows
- Yellow floor paint

A summary of components coated with lead based paint can be found in section 5.

The information contained in this report summarizes the sampling and analytical methodologies, site description, materials found to contain lead, locations of surfaces, sample results and qualifications of personnel. Massachusetts Childhood Lead Poisoning Prevention Program regulations CMR 160.00 define a dangerous level of lead for residential premises to be equal to or greater than 1.0 milligrams per square centimeter (mg/cm2). The New Hampshire Rules HeP-1600 agrees with Massachusetts, however, refers to that level of lead content as a "lead based substance". OSHA believes that lead exposure with "any" lead content may cause a health risk to workers.

2 Site Description:

The building inspected for the presence of lead based paint is located at **21 Water Street** in **Cambridge, Massachusetts**. The structure was built in approximately 1950 and is currently in operation.

The buildings' exterior is cinder block with metal windows. The MBTA owns the building and plans to demolish the entire structure.

The property is known as the **MBTA Tire Maintenance Shop.**

Surfaces tested consisted of interior and exterior walls, floors, doors and trim, windows and trim, ceilings, structural steel, floor and wall ceramic tiles, lockers, stall dividers, window bars, staircase components, cabinets, lally columns, radiators, baseboards, pipes, and overhead door systems.

3 Survey Personnel:

The OSHA survey for lead based paint was conducted by Mel Blackman, Massachusetts licensed Master Lead Inspector #M-1377, and New Hampshire Risk Assessor #RA-0026.

4 Testing Methodology:

Lead in paint sampling of representative interior and exterior building surfaces was conducted to assist with contractor compliance with the United States Department of Labor (US DOL) Occupational Safety and Health Administration (OSHA) Lead Exposure in Construction Standard (29 CFR 1936.62), and EPA Hazardous Waste Disposal Regulations (40 CFR Parts 260 through 271), as well as EPA's Renovation, Repair and Painting Final Rule (40 CFR 745), if applicable.

Representative surfaces from selected accessible areas of the buildings were analyzed using an X-Ray Fluorescence Analyzer (XRF). An RMD, LPA-1B Lead Paint Analyzer XRF, Serial Number ENG 1 was utilized, which is a complete lead paint analysis system that quickly, accurately, and non-destructively measures the concentration of LBP on surfaces.

An RMD X-Ray Fluorescence Analyzer, Model LPA-1, was used to perform the lead based paint survey. In conducting the determination, various representative architectural elements were tested. Not all painted surfaces in each functional space were tested for the presence of lead-based paint. The contractor should assume that similar components that were not tested must be treated with the same caution and requirements as potentially having high lead concentrations.

Surfaces, which are listed as N/A, were not reachable for testing, and therefore the condition of the paint was listed. At least three to ten readings were taken for all similar groups of components.

The LPA-1 XRF relies on the measurement of the K-shell X-rays to determine the amount of lead present in the painted surface. K-shell X-rays can penetrate many layers of paint and allow a good measurement of the lead content of paint to be made without being significantly affected by the thickness or number of layers of paints on the surface of the sample.

The LPA-1 has the ability to analyze and compute corrections for the difference in the energy spectrums relating the different substrates. This analysis of the energy spectrum means that the lead paint reading displayed on the instrument already accounts for any substrate effects and no correction is required by the operator. The LPA-1's field of view is limited to a depth of 3/8", deep enough to handle virtually all painted surfaces, but not prone to detect lead objects located behind the surface.

There are two measurement modes of operation in the LPA-1 analyzer namely the "Standard Mode" and the "Quick Mode". In the "Standard" mode, the operator selects a fixed measurement time that remains constant irrespective of the lead signal. In the "Quick" mode, the analyzer automatically adjusts the measurement time to be the least time that is needed to make a definitive measurement with a 95% confidence level (2 sigma). The LPA-1 analyzer will finish a measurement once the 2-sigma confidence level is achieved and the data is statistically meaningful. This time period for conclusive measurements is typically between 1 to 5 seconds, but can extend to a measurement of 60 seconds depending on the action level for abatement.

I utilized the LPA-1 in the "Quick" mode to achieve a 95% confidence level down to 0.2 mg/cm2 for the testing performed at this unit. The highest level of LBP reported by the LPA-1 using the "Quick" mode is a result of >9.9 mg/cm2 (greater than 9.9 mg/cm2). Calibrations conducted indicated the instrument was functioning within the standard deviation as defined by the manufacturer.

Following the manufacturers' requirements for calibration, here are the results:

Cal. In: 1.1, 1.0, 1.1 mg/cm2
Cal. Out: 1.1, 1.0, 1.0 mg/cm2

5 Summary of XRF Testing Results:

The following list is arranged by location and component type. Surfaces found to have higher lead concentrations are listed first in each section. The contractor should assume that similar components that were not tested should be treated with the same caution and requirements as potentially having high lead concentrations. Surfaces, which are listed as N/A, were not reachable for testing, and therefore it is assumed that they contain lead paint. The condition of the majority of painted surfaces containing any concentrations of lead paint is intact.

INTERIOR

1st FLOOR SHOP & OFFICE AREAS

Yellow floor paint 3.6 – 3.9 mg/cm2
White metal windows 1.4 – 1.7 mg/cm2
Red metal "I" beams 0.2 – 0.7 mg/cm2
White metal roof 0.2 – 0.5 mg/cm2
Red metal lally columns 0.1 – 0.5 mg/cm2
Gray concrete window sills 0.1 – 0.4 mg/cm2
Green, beige, and brown cinderblock walls 0.0 – 0.3 mg/cm2
White metal roof trusses 0.1 – 0.3 mg/cm2
Brown metal door 0.0 – 0.3 mg/cm2
Green and brown metal doors and trim 0.1 – 0.4 mg/cm2
Brown wood walls 0.0 – 0.2 mg/cm2
Gray concrete floor 0.0 – 0.1 mg/cm2
Silver metal gate 0.1- 0.2 mg/cm2
Brown wood window and door trim 0.0 – 0.1 mg/cm2
White wood stair risers and treads 0.0 – 0.2 mg/cm2
Brown wood handrails 0.0 – 0.1 mg/cm2
Brown wood kitchen cabinets 0.0 – 0.1 mg/cm2

1ST FLOOR BATH AND LOCKER AREA

White metal windows 1.4 – 1.6 mg/cm2
Brown metal door and trim 0.1 – 0.3 mg/cm2
Green metal stall dividers 0.0 – 0.2 mg/cm2
Beige cinderblock walls 0.0 – 0.1 mg/cm2
Beige metal lockers 0.0 – 0.2 mg/cm2

2ND FLOOR

White metal windows 1.0 – 1.5 mg/cm2
Green and beige metal roof trusses 0.0 – 0.4 mg/cm2
Green and brown wood doors and trim 0.0 – 0.4 mg/cm2
Green and beige metal roof 0.1 – 0.3 mg/cm2
White metal radiators 0.1 – 0.3 mg/cm2

Beige cinderblock walls 0.1 – 0.3 mg/cm2
Brown, green, and white wood walls 0.0 – 0.2 mg/cm2
White wood door trim 0.0 – 0.2 mg/cm2
Brown wood baseboards 0.0 – 0.1 mg/cm2
White metal pipes 0.0 – 0.1 mg/cm2
Gray wood floor 0.0 – 0.1 mg/cm2

2ND FLOOR BATHROOMS
White and gray tile floors 0.1 – 0.3 mg/cm2
White tile lower walls 0.0 – 0.2 mg/cm2
Gray and brown metal stall dividers 0.1 – 0.3 mg/cm2

EXTERIOR
Blue metal overhead door trim 0.5 – 0.6 mg/cm2
Yellow metal overhead door trim 0.4 – 0.6 mg/cm2
Yellow metal lally columns 0.4 – 0.6 mg/cm2
Brown metal door and trim 0.1 – 0.4 mg/cm2
Yellow and orange wood overhead door 0.1 – 0.3 mg/cm2
Beige cinderblock walls 0.1 – 0.3 mg/cm2
White metal overhead door 0.0 – 0.2 mg/cm2
Gray metal windows 0.0 – 0.1 mg/cm2

Conclusions and Recommendations:

Few of the interior surfaces tested contain high levels of lead paint. A composite sampling of the aggregate waste stream from demolition would be necessary to determine whether the TCLP testing is considered hazardous waste. Prior to demolition of this building an OSHA site specific lead compliance plan should be developed including wasted segregation to minimize the potential generation of hazardous waste.

In areas where demolition is to occur and lead is present, the demolition debris waste stream should be further analyzed during segregation for compliance with EPA and MA DES regulations to ensure proper disposal. TCLP testing should be performed to characterize all waste prior to disposal. TCLP testing can be performed prior to waste segregation but results may not be indicative of the actual waste streams produced during demolition. Demolition/renovation workers should be trained and protected in accordance with OSHA regulations 29 CFR 1926.62 and EPA's Renovation, Repair and Painting Final Rule (40 CFR 745).

This section applies to all construction work where an employee may be occupationally exposed to lead. All construction work excluded from coverage in the general industry for lead by 29 CFR 1910.1025 (a)(2) is covered by this standard. Construction work is defined as work for construction, alteration and/or repair, including painting and decorating. It includes but is not limited to the following:

- Demolition or salvage of structures where lead or materials containing lead is present
- Removal or encapsulation of materials containing lead;
- New Construction, alteration, repair, or renovation of structures, substrates, or portions thereof that contain lead, or materials containing lead.
- Handlers of salvageable materials and the treatment/disposal facility must be informed of the material's lead content. All personnel involved must be trained in personal protection and proper work practice procedures in accordance with OSHA regulations.
- All waste contaminated with lead paint should be disposed of in accordance with all state, local, and federal regulations.

Respectfully submitted

Mel Blackman

Attachment C

AmeriSci Asbestos Analytical Laboratory Report, dated November 11, 2011

Please Reply To:

AmeriSci Richmond
13635 GENITO ROAD
MIDLOTHIAN, VIRGINIA 23112
TEL: (804) 763-1200 • FAX: (804) 763-1800

FACSIMILE TELECOPY TRANSMISSION

To: Marylou Armstrong
Nover - Armstrong Associates Inc.

Fax #:

Email: mla_noverarmstrong@msn.com

From: David W. Ralbovsky
AmeriSci Job #: 111111359
Subject: PLM 3 day Results
Client Project: P2814; P2814; 21 Water St.

Date: Thursday, November 10, 2011
Time: 13:14:26
Comments:

Number of Pages: 14
(including cover sheet)

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AmeriSci Richmond
13635 GENITO ROAD
MIDLOTHIAN, VIRGINIA 23112
TEL: (804) 763-1200 • FAX: (804) 763-1800

PLM Bulk Asbestos Report

Nover - Armstrong Associates Inc.
Attn: Marylou Armstrong
124 Main Street
Unit 2GG
Carver, MA 02330

Date Received 11/08/11
Date Examined 11/10/11

AmeriSci Job # 111111359
P.O. # P2814

RE: P2814; P2814; 21 Water St.

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
AS-1.1 1	111111359-01 **Location:** Shop Area; Concrete Block Wall	*No*	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-1.2 1	111111359-02 **Location:** Utility Room; Concrete Block Wall	*No*	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-1.3 1	111111359-03 **Location:** Exterior Corner Of Bldg; Concrete Block Wall	*No*	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-1.4 1	111111359-04 **Location:** Exterior Corner Of Bldg; Concrete Block Wall	*No*	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-2.1 2	111111359-05.1 **Location:** Utility Room; 4" Pipe Insulation & Wrap	*No*	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray/Gold/Yellow, Heterogeneous, Fibrous, Wrap/Insulation **Asbestos Types:** **Other Material:** Fibrous glass 93 %, Non-fibrous 7 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

P2814; P2814; 21 Water St.

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
AS-2.2 2	111111359-06 **Location:** Utility Room; 4" Pipe Insulation & Wrap	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray/Yellow, Heterogeneous, Fibrous, Wrap/Insulation **Asbestos Types:** **Other Material:** Fibrous glass 93 %, Non-fibrous 7 %			
AS-2.3 2	111111359-07 **Location:** Utility Room; 4" Pipe Insulation & Wrap	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray/Yellow, Heterogeneous, Fibrous, Wrap/Insulation **Asbestos Types:** **Other Material:** Fibrous glass 93 %, Non-fibrous 7 %			
AS-3.1 3	111111359-08 **Location:** Storage Room; Drywall	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Brown/Off-White, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 5 %, Fibrous glass Trace, Non-fibrous 95 %			
AS-3.2 3	111111359-09 **Location:** Storage Room; Drywall	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Off White, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 4 %, Fibrous glass Trace, Non-fibrous 96 %			
AS-3.3 3	111111359-10 **Location:** Storage Room; Drywall	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Brown/Off-White, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 5 %, Fibrous glass Trace, Non-fibrous 95 %			
AS-4.1 4	111111359-11.1 **Location:** Shop Area; Caulking / Horse Hair Plaster	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Caulk **Asbestos Types:** **Other Material:** Non-fibrous 100 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

P2814; P2814; 21 Water St.

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
AS-4.1 4	111111359-11.2 **Location:** Shop Area; Caulking / Horse Hair Plaster	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Brown, Heterogeneous, Fibrous, Fibrous Material **Asbestos Types:** **Other Material:** Cellulose 95 %, Non-fibrous 5 %			
AS-4.2 4	111111359-12.1 **Location:** Shop Area; Caulking / Horse Hair Plaster	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Caulk **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-4.2 4	111111359-12.2 **Location:** Shop Area; Caulking / Horse Hair Plaster	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Brown, Heterogeneous, Non-Fibrous, Fibrous Material **Asbestos Types:** **Other Material:** Cellulose 95 %, Non-fibrous 5 %			
AS-5.1 5	111111359-13 **Location:** Break Room; Drywall	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Brown/Gray, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 5 %, Non-fibrous 95 %			
AS-5.2 5	111111359-14 **Location:** Break Room; Drywall	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Brown/Gray, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 5 %, Non-fibrous 95 %			
AS-5.3 5	111111359-15 **Location:** Break Room; Drywall	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Brown/Gray, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 5 %, Non-fibrous 95 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

P2814; P2814; 21 Water St.

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
AS-6.1 6	111111359-16 **Location:** Break Room; Black Cove Base	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Black, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-6.2 6	111111359-17 **Location:** Break Room; Black Cove Base	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Black, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-6.3 6	111111359-18 **Location:** Break Room; Black Cove Base	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Black, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-7.1 7	111111359-19 **Location:** Break Room; 24"x48" Suspended Ceiling Tile	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: White/Lt.Grey, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 45 %, Fibrous glass 28 %, Non-fibrous 5 %, Perlite 22 %			
AS-7.2 7	111111359-20 **Location:** Break Room; 24"x48" Suspended Ceiling Tile	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: White/Lt.Grey, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 45 %, Fibrous glass 26 %, Non-fibrous 5 %, Perlite 24 %			
AS-7.3 7	111111359-21 **Location:** 1st Floor Offices; 24"x48" Suspended Ceiling Tile	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: White/Lt.Grey, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 45 %, Fibrous glass 26 %, Non-fibrous 5 %, Perlite 24 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

P2814; P2814; 21 Water St.

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
AS-7.4 7	111111359-22 **Location:** 2nd Floor Hallway; 24"x48" Suspended Ceiling Tile	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: White/Lt.Grey, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 45 %, Fibrous glass 22 %, Non-fibrous 5 %, Perlite 28 %			
AS-8.1 8	111111359-23.1 **Location:** Break Room; 12" VFT - Light Grey & Blue	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Blue/Gray, Heterogeneous, Non-Fibrous, Floor Tile **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-8.1 8	111111359-23.2 **Location:** Break Room; 12" VFT - Light Grey & Blue	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Tan/Gray, Heterogeneous, Non-Fibrous, Mastic/Backing **Asbestos Types:** **Other Material:** Cellulose 4 %, Non-fibrous 96 %			
AS-8.2 8	111111359-24.1 **Location:** Break Room	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Blue/Gray, Heterogeneous, Non-Fibrous, Floor Tile **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-8.2 8	111111359-24.2 **Location:** Break Room	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Tan/Gray, Heterogeneous, Non-Fibrous, Mastic/Backing **Asbestos Types:** **Other Material:** Cellulose 4 %, Non-fibrous 96 %			
AS-8.3 8	111111359-25.1 **Location:** Break Room	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Blue/Gray, Heterogeneous, Non-Fibrous, Floor Tile **Asbestos Types:** **Other Material:** Non-fibrous 100 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

P2814; P2814; 21 Water St.

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
AS-8.3 8	111111359-25.2 **Location:** Break Room	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Tan, Heterogeneous, Non-Fibrous, Mastic/Backing **Asbestos Types:** **Other Material:** Cellulose Trace, Non-fibrous 100 %			
AS-9.1 9	111111359-26 **Location:** 1st To 2nd Floor Office Staircase; Stair Tread - Black	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Black, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-9.2 9	111111359-27 **Location:** 1st To 2nd Floor Office Staircase; Stair Tread - Black	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Black, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-9.3 9	111111359-28 **Location:** 1st To 2nd Floor Office Staircase; Stair Tread - Black	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Black, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-10.1 10	111111359-29.1 **Location:** Rear Hallway; 9" VFT, Grey	***Yes***	3 % (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** Chrysotile 3.0 % **Other Material:** Non-fibrous 97 %			
AS-10.1 10	111111359-29.2 **Location:** Rear Hallway; 9" VFT, Grey	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Black, Heterogeneous, Non-Fibrous, Mastic **Asbestos Types:** **Other Material:** Cellulose Trace, Non-fibrous 100 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

P2814; P2814; 21 Water St.

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
AS-10.2 10	111111359-30.1 **Location:** Rear Hallway; 9" VFT, Grey **Analyst Description:** Floor Tile **Asbestos Types:** **Other Material:**		NA/PS
AS-10.2 10	111111359-30.2 **Location:** Rear Hallway; 9" VFT, Grey **Analyst Description:** Black, Heterogeneous, Non-Fibrous, Mastic **Asbestos Types:** **Other Material:** Cellulose Trace, Non-fibrous 100 %	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
AS-10.3 10	111111359-31.1 **Location:** Rear Hallway; 9" VFT, Grey **Analyst Description:** Floor Tile **Asbestos Types:** **Other Material:**		NA/PS
AS-10.3 10	111111359-31.2 **Location:** Rear Hallway; 9" VFT, Grey **Analyst Description:** Black, Heterogeneous, Non-Fibrous, Mastic **Asbestos Types:** **Other Material:** Cellulose Trace, Non-fibrous 100 %	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
AS-11.1 11	111111359-32.1 **Location:** Ladies Bathroom - 2nd Floor; 1" Ceramic Tile & Caulking **Analyst Description:** Gray, Heterogeneous, Non-Fibrous, Ceramic Tile **Asbestos Types:** **Other Material:** Non-fibrous 100 % **Comment:** Insufficient caulk for analysis.	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11

See Reporting notes on last page

PLM Bulk Asbestos Report

P2814; P2814; 21 Water St.

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
AS-11.1 11	111111359-32.2 **Location:** Ladies Bathroom - 2nd Floor; 1" Ceramic Tile & Caulking	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Lt. Gray, Heterogeneous, Non-Fibrous, Grout **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-11.1 11	111111359-32.3 **Location:** Ladies Bathroom - 2nd Floor; 1" Ceramic Tile & Caulking	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Brown/Black, Heterogeneous, Non-Fibrous, Backing **Asbestos Types:** **Other Material:** Cellulose 50 %, Non-fibrous 50 %			
AS-11.2 11	111111359-33.1 **Location:** Ladies Bathroom - 2nd Floor; 1" Ceramic Tile & Caulking	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Ceramic Tile **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-11.2 11	111111359-33.2 **Location:** Ladies Bathroom - 2nd Floor; 1" Ceramic Tile & Caulking	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Lt. Gray, Heterogeneous, Non-Fibrous, Grout **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-11.2 11	111111359-33.3 **Location:** Ladies Bathroom - 2nd Floor; 1" Ceramic Tile & Caulking	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Brown/Black, Heterogeneous, Fibrous, Backing **Asbestos Types:** **Other Material:** Cellulose 50 %, Non-fibrous 50 %			
AS-11.3 11	111111359-34 **Location:** Ladies Bathroom - 2nd Floor; Caulking Around 4" Ceramic Tile	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Beige, Heterogeneous, Non-Fibrous, Grout **Asbestos Types:** **Other Material:** Non-fibrous 100 % **Comment:** Insufficient caulk for analysis.			

See Reporting notes on last page

PLM Bulk Asbestos Report

P2814; P2814; 21 Water St.

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
AS-12.1 12	111111359-35 **Location:** Exterior Window; Window Caulking	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-12.2 12	111111359-36 **Location:** Exterior Window; Window Caulking	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-12.3 12	111111359-37 **Location:** Exterior Window; Window Caulking	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-13.1 13	111111359-38 **Location:** Shop Area; Morter In Concrete Wall	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
AS-13.2 13	111111359-39 **Location:** Shop Area; Morter In Concrete Wall	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Gray, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Non-fibrous 100 %			
Roof-1	111111359-40 **Location:** Roof; Gravel, Tar, Paper, Membrane	***No***	NAD (by CVES) by David W. Ralbovsky on 11/10/11
Analyst Description: Black, Heterogeneous, Non-Fibrous, Bulk Material **Asbestos Types:** **Other Material:** Cellulose 5 %, Fibrous glass Trace, Synthetic fibers 2 %, Non-fibrous 93 %			

See Reporting notes on last page

PLM Bulk Asbestos Report

P2814; P2814; 21 Water St.

Reporting Notes:

Analyzed by: David W. Ralbovsky _____ Date 4/10/11

*NAD = no asbestos detected, Detection Limit <1%, Reporting Limits: CVES = 1%, 400 Pt Ct = 0.25%, 1000 Pt Ct = 0.1%; "Present" or NVA = "No Visible Asbestos" are observations made during a qualitative analysis; NA = not analyzed; NA/PS = not analyzed / positive stop; PLM Bulk Asbestos Analysis by EPA 600/M4-82-020 per 40 CFR 763 (NVLAP Lab Code 101904-0) and ELAP PLM Analysis Protocol 198.1 for New York friable samples (198.6 for NOB samples)(NYSDOH ELAP Lab # 10984); CA ELAP Lab # 2508; Note: PLM is not consistently reliable in detecting asbestos in floor coverings and similar NOB materials. NAD or Trace results by PLM are inconclusive, TEM is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos-containing in New York State (also see EPA Advisory for floor tile, FR 59, 146, 38970, 8/1/94). NIST Accreditation requirements mandate that this report must not be reproduced except in full without the approval of the laboratory. This PLM report relates ONLY to the items tested.

Reviewed By:_____

Relinquished By: Marylou Armstrong Date/Time: 11/4/2011 @ 9:00 AM
Received By: Date/Time:
Relinquished By: Date/Time:
Received By: Date/Time:

AMERISCI BOSTON

BULK CHAIN OF CUSTODY FOR

8 SCHOOL STREET ~ WEYMOUTH, MA 0218
PHONE (781) 337-9334 / FAX (781) 337-764
TOLL FREE (888) 724-522
www.amerisci.co

Company: Nover-Armstrong Associates, Inc.
Street Address: 124 Main St, Unit 2GG
City: Carver State: MA Zip: 02330
Phone: 508-866-8383 Fax: 508-866-9898
Cell/Page #: Verbal Results: Y / (N)
Results to: Marylou Armstrong

Project: P2814 AMERISCI #: 111111359
Project Address: 21 Water St. Project #: P2814
Project Manger: M. Armstrong PO #: P2814
Analysis: X PLM X Positive Stop __ Qualitative __ Point Count __ NOB (Prep) __ TEM
Turnaround Time: 4 days. ~~Fax~~ Email Copy By: 11/11/2011
Sampled By: M. Armstrong Date: 11/2/2011

Special Instructions or Comments:

Lab ID	Field ID	Location	Sample Description	Homogenous Area
	AS-1.1	shop area	concrete block wall	
	AS-1.2	utility room	"	
	AS-1.3	exterior corner of bldg.	"	
	AS-1.4	exterior wall of bldg	"	
	AS-2.1	utility room	4" pipe insulation & wrap	
	AS-2.2	" "	" "	
	AS-2.3	" "	" "	
	AS-3.1	storage room	dry wall	
	AS-3.2	"	"	
	AS-3.3	"	"	
	AS-4.1	shop area	caulking / hose hair plaster?	
	AS-4.2	shop area	" "	
	AS-5.1	break room	dry wall	
	AS-5.2	"	"	
	AS-5.3	"	"	
	AS-6.1	"	black cove base	
	AS-6.2	"	"	
	AS-6.3	"	"	

RECEIVED NOV 08 2011 By

NVLAP: 102079-0, CT: PH-0119, HI: L-01-030, ME: LA0060 / LB0059, MA: AA000162, RI: AAL095T3

Relinquished By: Tyler Armstrong Date/Time: 11/4/2011 @9:00AM
Received By: Date/Time:
Relinquished By: Date/Time:
Received By: Date/Time:

AMERISCI BOSTON

BULK CHAIN OF CUSTODY FOR

8 SCHOOL STREET ~ WEYMOUTH, MA 0218
PHONE (781) 337-9334 / FAX (781) 337-764
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Company: Nower-Armstrong Associates
Street Address: 124 main St, Unit 2GG
City: Carver State: MA Zip: 02330
Phone: 508-866-8383 Fax: 508-866-9878
Cell/Page #: Verbal Results: Y / N
Results to: Marylou Armstrong

Project: P2814 AMERISCI #: 111111359
Project Address: 21 Water St. Project #: P2814
Project Manger: M. Armstrong PO #: P2814
Analysis: X PLM X Positive Stop __Qualitative __Point Count __NOB (Prep) __TEM
Turnaround Time: 4 days ~~Fax~~ EMAIL Copy By: 11-11-2011
Sampled By: M. Armstrong Date: 11-2-2011

Special Instructions or Comments:

Lab ID	Field ID	Location	Sample Description	Homogenous Area
	AS-7.1	break room	24" x 48" suspended ceiling tile	
	AS-7.2	break room	"	
	AS-7.3	1st floor offices	"	
	AS-7.4	2nd floor hallway	"	
	AS-8.1	breakroom	12" VFT-light grey & blue	
	AS-8.2	"		
	AS-8.3	"		
	AS-9.1	1st to 2nd floor office staircase	stair tread-black	
	AS-9.2	"	"	
	AS-9.3	"	"	
	AS-10.1	rear hallway	9" VFT, grey	
	AS-10.2	"	"	
	AS-10.3	"	"	
	AS-11.1	ladies bathroom-2nd floor	1" ceramic tile & caulking	
	AS-11.2	"	"	
	AS-11.3	"	caulking around 4" ceramic tile	
	AS-12.1	exterior windows	window caulking	
	AS-12.2	"	"	
	AS-12.3	"	"	

RECEIVED NOV 08 2011 By AW

NVLAP: 102079-0, CT: PH-0119, HI: L-01-030, ME: LA0060 / LB0059, MA: AA000162, RI: AAL095T3

Relinquished By: Tylan Armstrong Date/Time: 11/4/2011-9:00am
Received By: Date/Time:
Relinquished By: Date/Time:
Received By: Date/Time:

AMERISCI BOSTON

BULK CHAIN OF CUSTODY FOR

8 SCHOOL STREET ~ WEYMOUTH, MA 0218
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AMERISCI #: 111111359

Company: Nover-Armstrong Associates, Inc.
Street Address: 124 Main St. Unit 2G
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Phone: 508.866.8383 Fax: 508.866.8598
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Results to: Marylou Armstrong

Project: P2814
Project Address: 21 Water St.
Project #: P2814
Project Manger: M. Armstrong
PO #: P2814
Analysis: X PLM X Positive Stop __Qualitative __Point Count __NOB (Prep) __TEM
Turnaround Time: 4 Days Fax Copy By: 11-11-2011
Sampled By: M. Armstrong Date: 11-2-2011

Special Instructions or Comments:

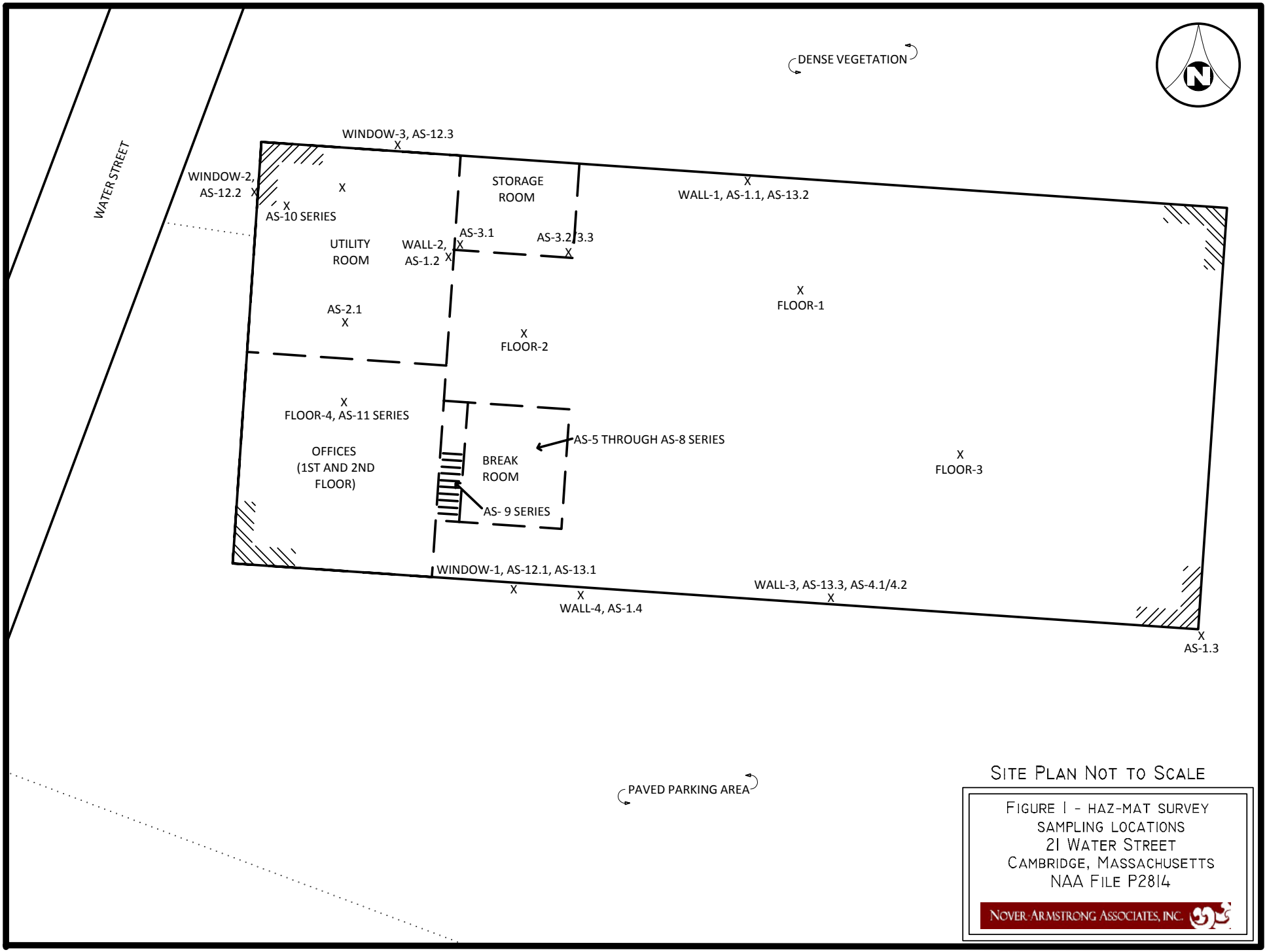
Lab ID	Field ID	Location	Sample Description	Homogenous Area
	AS-13.1	shop area	mortar in concrete wall	
	AS-13.1	" "	" "	
	ROOF-1	roof	gravel, tar, paper, membrane	

RECEIVED
NOV 08 2011
By: AL

PAGE 3 OF

Attachment D

Asbestos Inspector Certification, Photographs & Notes



SITE PLAN NOT TO SCALE

FIGURE 1 - HAZ-MAT SURVEY
SAMPLING LOCATIONS
21 WATER STREET
CAMBRIDGE, MASSACHUSETTS
NAA FILE P2814

NOVER-ARMSTRONG ASSOCIATES, INC.

Photo 1

Photograph depicts the southern side of the MBTA Tire Maintenance Facility.

Photo 2

Photograph depicts the Tire Shop entrance door and overhead door (leading into the main shop area) along the southern side of the Facility structure.

PHOTOGRAPHIC DOCUMENTATION

21 Water Street

Cambridge, Massachusetts

Photographs Documented 11-02-2011

NAA File P2814

Photo 3

Photograph depicts the main shop area.

Photo 4

Photograph depicts FLOOR-2 caulking sample that tested positive for PCBs.

PHOTOGRAPHIC DOCUMENTATION

21 Water Street

Cambridge, Massachusetts

Photographs Documented 11-02-2011

NAA File P2814

Photo 5

Photograph depicts the AS-10 series that tested positive for asbestos.

Photo 6

Photograph depicts the WINDOW-2 and AS-12.2 sampling locations (along the western side of the facility). This caulking sample tested positive for PCBs.

PHOTOGRAPHIC DOCUMENTATION

21 Water Street

Cambridge, Massachusetts

Photographs Documented 11-02-2011

NAA File P2814

INSTITUTE FOR ENVIRONMENTAL EDUCATION, INC.

16 Upton Drive Wilmington, MA 01887
PHONE (978) 658-5272

IEE

IEE

This is to certify that

Marylou Armstrong

has completed the requisite training, and has passed an examination for reaccreditation as:

Asbestos Inspector Refresher

pursuant to Title II of the Toxic Substance Control Act, 15 U.S.C. 2646

January 26, 2011
Course Dates

January 26, 2011
Examination Date

Course Location
Institute for Environmental Education, Inc.
16 Upton Drive
Wilmington, MA 01887

January 26, 2012
Expiration Date

11-6128-106-200965
Certificate Number

Training Director

Commonwealth of Massachusetts

Division of Occupational Safety

Heather E. Rowe, Acting Commissioner

Asbestos Inspector

MARYLOU ARMSTRONG

Eff. Date 01/27/11

Exp. Date 01/26/12

AI041371

Member of C.O.N.E.S.

NB

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NB-RENEWAL

Attachment E

Alpha Analytical Report (PCBs), dated November 11, 2011

ANALYTICAL REPORT

Lab Number:	L1118311
Client:	Nover-Armstrong Associates 124 Main Street Unit 2GG Carver, MA 02330
ATTN:	Marylou Armstrong
Phone:	(508) 866-8383
Project Name:	P2814
Project Number:	P2814
Report Date:	11/17/11

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), USDA (Permit #P-330-11-00240), NC (666), TX (T104704476), DOD (L2217), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: P2814
Project Number: P2814

Lab Number: L1118311
Report Date: 11/17/11

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L1118311-01	WALL-1	CAMBRIDGE	11/02/11 00:00
L1118311-02	WALL-2	CAMBRIDGE	11/02/11 00:00
L1118311-03	WALL-3	CAMBRIDGE	11/02/11 00:00
L1118311-04	WALL-4	CAMBRIDGE	11/02/11 00:00
L1118311-05	WINDOW-1	CAMBRIDGE	11/02/11 00:00
L1118311-06	WINDOW-2	CAMBRIDGE	11/02/11 00:00
L1118311-07	WINDOW-3	CAMBRIDGE	11/02/11 00:00
L1118311-08	FLOOR-1	CAMBRIDGE	11/02/11 00:00
L1118311-09	FLOOR-2	CAMBRIDGE	11/02/11 00:00
L1118311-10	FLOOR-3	CAMBRIDGE	11/02/11 00:00
L1118311-11	FLOOR-4	CAMBRIDGE	11/02/11 00:00

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

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

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name: P2814 **Lab Number:** L1118311
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Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

For additional information, please contact Client Services at 800-624-9220.

Report Submission

This report replaces the report issued November 11, 2011. At the client's request, the project location was changed.

MCP Related Narratives

PCBs

L1118311-01 and -04 have elevated detection limits due to the dilutions required by matrix interferences encountered during the concentrations of the samples and limited sample volumes available for analyses.
L1118311-02 has elevated detection limits due to the dilution required by matrix interferences encountered during the concentration of the sample and limited sample volume available for analysis.
L1118311-03, -05, -06, and -07 have elevated detection limits due to the dilutions required by the matrix interferences encountered during the concentrations of the samples, the limited sample volumes available for

Case Narrative (continued)

analyses, and the analytical dilutions required by the target compounds present in the samples.
L1118311-08 and -11 have elevated detection limits due to limited sample volumes available for analyses.
L1118311-09 has elevated detection limits due to the dilutions required by the elevated concentrations of target compounds in the samples and limited sample volumes available for analyses.
In reference to question G:
L1118311-01 through -09 and -11: One or more of the target analytes did not achieve the requested CAM reporting limits.
In reference to question H:
The surrogate recoveries for L1118311-03, -05, -06, -07, and -09 are below the acceptance criteria for 2,4,5,6-Tetrachloro-m-xylene (0%) and Decachlorobiphenyl (0%) due to the dilutions required to quantitate the samples. Re-extractions were not required; therefore, the results of the original analyses are reported.
The surrogate recoveries for L1118311-11 were outside the acceptance criteria for Decachlorobiphenyl (22%/28%); however, re-extraction could not be performed due to lack of additional sample. The results of the original analysis are reported; however, all associated compounds are considered to have a potential bias.
The WG500555-1 Method Blank, associated with L1118311-01 through -11, has a hit of Aroclor 1260 that exceeded the calibration. The result should be considered estimated, and is qualified with an E flag.
The WG500555-1 Method Blank, associated with L1118311-01 through -11, has a concentration above the reporting limit for Aroclor 1260; re-extraction could not be performed due to lack of additional volume for the associated samples. The results of the original analysis are reported and are qualified with a "B" for any associated sample concentrations that are less than 10x the Method Blank concentration for this analyte.
The WG500555-3 LCSD recoveries, associated with L1118311-01 through -11, were outside the acceptance criteria for Aroclor 1016 (31%) and Aroclor 1260 (32%); however, re-extraction could not be performed due to lack of additional sample. The results of the original analyses are reported; however, all results are considered to have a potentially low bias.
The WG500555-2/-3 LCS/LCSD RPDs, associated with L1118311-01 through -11, are above the acceptance criteria for Aroclor 1016 (87%) and Aroclor 1260 (102%).
The surrogate recoveries for the WG500555-3 LCSD, associated with L1118311-01 through -11, were outside the acceptance criteria for 2,4,5,6-Tetrachloro-m-xylene (20%/19%) and Decachlorobiphenyl

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Case Narrative (continued)

(26%/25%).

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Elizabeth Simmons

Title: Technical Director/Representative Date: 11/17/11

ORGANICS

PCBS

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-01	Date Collected:	11/02/11 00:00
Client ID:	WALL-1	Date Received:	11/04/11
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 09:09	Cleanup Method1:	EPA 3665A
Analyst:	GT	Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	739	--	5
Aroclor 1221	ND		ug/kg	739	--	5
Aroclor 1232	ND		ug/kg	739	--	5
Aroclor 1242	ND		ug/kg	739	--	5
Aroclor 1248	ND		ug/kg	493	--	5
Aroclor 1254	ND		ug/kg	739	--	5
Aroclor 1262	ND		ug/kg	246	--	5
Aroclor 1268	ND		ug/kg	246	--	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	87		30-150
Decachlorobiphenyl	69		30-150
2,4,5,6-Tetrachloro-m-xylene	126		30-150
Decachlorobiphenyl	105		30-150

Project Name: P2814 **Lab Number:** L1118311

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SAMPLE RESULTS

Lab ID:	L1118311-01	Date Collected:	11/02/11 00:00
Client ID:	WALL-1	Date Received:	11/04/11
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 09:09	Cleanup Method1:	EPA 3665A
Analyst:	GT	Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	1240	B	ug/kg	493	--	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	87		30-150
Decachlorobiphenyl	69		30-150
2,4,5,6-Tetrachloro-m-xylene	126		30-150
Decachlorobiphenyl	105		30-150

Project Name: P2814 **Lab Number:** L1118311

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SAMPLE RESULTS

Lab ID:	L1118311-02	Date Collected:	11/02/11 00:00
Client ID:	WALL-2	Date Received:	11/04/11
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 09:22	Cleanup Method1:	EPA 3665A
Analyst:	GT	Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	528	--	5
Aroclor 1221	ND		ug/kg	528	--	5
Aroclor 1232	ND		ug/kg	528	--	5
Aroclor 1242	ND		ug/kg	528	--	5
Aroclor 1248	ND		ug/kg	352	--	5
Aroclor 1254	ND		ug/kg	528	--	5
Aroclor 1260	ND		ug/kg	352	--	5
Aroclor 1262	ND		ug/kg	176	--	5
Aroclor 1268	ND		ug/kg	176	--	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	65		30-150
Decachlorobiphenyl	53		30-150
2,4,5,6-Tetrachloro-m-xylene	65		30-150
Decachlorobiphenyl	57		30-150

Project Name: P2814 **Lab Number:** L1118311

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SAMPLE RESULTS

Lab ID:	L1118311-03	D	Date Collected:	11/02/11 00:00
Client ID:	WALL-3		Date Received:	11/04/11
Sample Location:	CAMBRIDGE		Field Prep:	Not Specified
Matrix:	Solid		Extraction Method:	EPA 3540C
Analytical Method:	97,8082		Extraction Date:	11/07/11 11:30
Analytical Date:	11/11/11 07:34		Cleanup Method1:	EPA 3665A
Analyst:	GT		Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.		Cleanup Method2:	EPA 3660B
			Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	19300000	--	250000
Aroclor 1221	ND		ug/kg	19300000	--	250000
Aroclor 1232	ND		ug/kg	19300000	--	250000
Aroclor 1242	ND		ug/kg	19300000	--	250000
Aroclor 1248	ND		ug/kg	12900000	--	250000
Aroclor 1254	ND		ug/kg	19300000	--	250000
Aroclor 1262	ND		ug/kg	6440000	--	250000
Aroclor 1268	ND		ug/kg	6440000	--	250000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-03	D	Date Collected:	11/02/11 00:00
Client ID:	WALL-3		Date Received:	11/04/11
Sample Location:	CAMBRIDGE		Field Prep:	Not Specified
Matrix:	Solid		Extraction Method:	EPA 3540C
Analytical Method:	97,8082		Extraction Date:	11/07/11 11:30
Analytical Date:	11/11/11 07:34		Cleanup Method1:	EPA 3665A
Analyst:	GT		Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.		Cleanup Method2:	EPA 3660B
			Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	191000000		ug/kg	12900000	--	250000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

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SAMPLE RESULTS

Lab ID:	L1118311-04	Date Collected:	11/02/11 00:00
Client ID:	WALL-4	Date Received:	11/04/11
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 17:32	Cleanup Method1:	EPA 3665A
Analyst:	GT	Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	708	--	5
Aroclor 1221	ND		ug/kg	708	--	5
Aroclor 1232	ND		ug/kg	708	--	5
Aroclor 1242	ND		ug/kg	708	--	5
Aroclor 1248	ND		ug/kg	472	--	5
Aroclor 1254	ND		ug/kg	708	--	5
Aroclor 1262	ND		ug/kg	236	--	5
Aroclor 1268	ND		ug/kg	236	--	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	68		30-150
Decachlorobiphenyl	62		30-150
2,4,5,6-Tetrachloro-m-xylene	73		30-150
Decachlorobiphenyl	68		30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-04	Date Collected:	11/02/11 00:00
Client ID:	WALL-4	Date Received:	11/04/11
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 17:32	Cleanup Method1:	EPA 3665A
Analyst:	GT	Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	11400	B	ug/kg	472	--	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	68		30-150
Decachlorobiphenyl	62		30-150
2,4,5,6-Tetrachloro-m-xylene	73		30-150
Decachlorobiphenyl	68		30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-05	D	Date Collected:	11/02/11 00:00
Client ID:	WINDOW-1		Date Received:	11/04/11
Sample Location:	CAMBRIDGE		Field Prep:	Not Specified
Matrix:	Solid		Extraction Method:	EPA 3540C
Analytical Method:	97,8082		Extraction Date:	11/07/11 11:30
Analytical Date:	11/11/11 07:21		Cleanup Method1:	EPA 3665A
Analyst:	GT		Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.		Cleanup Method2:	EPA 3660B
			Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56000000	--	125000
Aroclor 1221	ND		ug/kg	56000000	--	125000
Aroclor 1232	ND		ug/kg	56000000	--	125000
Aroclor 1242	ND		ug/kg	56000000	--	125000
Aroclor 1248	ND		ug/kg	37300000	--	125000
Aroclor 1254	ND		ug/kg	56000000	--	125000
Aroclor 1262	ND		ug/kg	18600000	--	125000
Aroclor 1268	ND		ug/kg	18600000	--	125000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-05	D	Date Collected:	11/02/11 00:00
Client ID:	WINDOW-1		Date Received:	11/04/11
Sample Location:	CAMBRIDGE		Field Prep:	Not Specified
Matrix:	Solid		Extraction Method:	EPA 3540C
Analytical Method:	97,8082		Extraction Date:	11/07/11 11:30
Analytical Date:	11/11/11 07:21		Cleanup Method1:	EPA 3665A
Analyst:	GT		Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.		Cleanup Method2:	EPA 3660B
			Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	993000000		ug/kg	37300000	--	125000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-06	D	Date Collected:	11/02/11 00:00
Client ID:	WINDOW-2		Date Received:	11/04/11
Sample Location:	CAMBRIDGE		Field Prep:	Not Specified
Matrix:	Solid		Extraction Method:	EPA 3540C
Analytical Method:	97,8082		Extraction Date:	11/07/11 11:30
Analytical Date:	11/11/11 07:08		Cleanup Method1:	EPA 3665A
Analyst:	GT		Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.		Cleanup Method2:	EPA 3660B
			Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	12500000	--	12500
Aroclor 1221	ND		ug/kg	12500000	--	12500
Aroclor 1232	ND		ug/kg	12500000	--	12500
Aroclor 1242	ND		ug/kg	12500000	--	12500
Aroclor 1248	ND		ug/kg	8330000	--	12500
Aroclor 1254	ND		ug/kg	12500000	--	12500
Aroclor 1262	ND		ug/kg	4170000	--	12500
Aroclor 1268	ND		ug/kg	4170000	--	12500

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-06	D	Date Collected:	11/02/11 00:00
Client ID:	WINDOW-2		Date Received:	11/04/11
Sample Location:	CAMBRIDGE		Field Prep:	Not Specified
Matrix:	Solid		Extraction Method:	EPA 3540C
Analytical Method:	97,8082		Extraction Date:	11/07/11 11:30
Analytical Date:	11/11/11 07:08		Cleanup Method1:	EPA 3665A
Analyst:	GT		Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.		Cleanup Method2:	EPA 3660B
			Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	110000000		ug/kg	8330000	--	12500

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-07	D	Date Collected:	11/02/11 00:00
Client ID:	WINDOW-3		Date Received:	11/04/11
Sample Location:	CAMBRIDGE		Field Prep:	Not Specified
Matrix:	Solid		Extraction Method:	EPA 3540C
Analytical Method:	97,8082		Extraction Date:	11/07/11 11:30
Analytical Date:	11/11/11 06:54		Cleanup Method1:	EPA 3665A
Analyst:	GT		Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.		Cleanup Method2:	EPA 3660B
			Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	48400000	--	50000
Aroclor 1221	ND		ug/kg	48400000	--	50000
Aroclor 1232	ND		ug/kg	48400000	--	50000
Aroclor 1242	ND		ug/kg	48400000	--	50000
Aroclor 1248	ND		ug/kg	32200000	--	50000
Aroclor 1254	ND		ug/kg	48400000	--	50000
Aroclor 1262	ND		ug/kg	16100000	--	50000
Aroclor 1268	ND		ug/kg	16100000	--	50000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-07	D	Date Collected:	11/02/11 00:00
Client ID:	WINDOW-3		Date Received:	11/04/11
Sample Location:	CAMBRIDGE		Field Prep:	Not Specified
Matrix:	Solid		Extraction Method:	EPA 3540C
Analytical Method:	97,8082		Extraction Date:	11/07/11 11:30
Analytical Date:	11/11/11 06:54		Cleanup Method1:	EPA 3665A
Analyst:	GT		Cleanup Date1:	11/09/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.		Cleanup Method2:	EPA 3660B
			Cleanup Date2:	11/09/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	620000000		ug/kg	32200000	--	50000

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-08	Date Collected:	11/02/11 00:00
Client ID:	FLOOR-1	Date Received:	11/04/11
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 01:55	Cleanup Method1:	EPA 3665A
Analyst:	GT	Cleanup Date1:	11/08/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	11/08/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	104	--	1
Aroclor 1221	ND		ug/kg	104	--	1
Aroclor 1232	ND		ug/kg	104	--	1
Aroclor 1242	ND		ug/kg	104	--	1
Aroclor 1248	ND		ug/kg	69.4	--	1
Aroclor 1262	ND		ug/kg	34.7	--	1
Aroclor 1268	ND		ug/kg	34.7	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	69		30-150
Decachlorobiphenyl	44		30-150
2,4,5,6-Tetrachloro-m-xylene	68		30-150
Decachlorobiphenyl	52		30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-08	Date Collected:	11/02/11 00:00
Client ID:	FLOOR-1	Date Received:	11/04/11
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 01:55	Cleanup Method1:	EPA 3665A
Analyst:	GT	Cleanup Date1:	11/08/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	11/08/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1254	313		ug/kg	104	--	1
Aroclor 1260	394	B	ug/kg	69.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	69		30-150
Decachlorobiphenyl	44		30-150
2,4,5,6-Tetrachloro-m-xylene	68		30-150
Decachlorobiphenyl	52		30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-09	D	Date Collected:	11/02/11 00:00
Client ID:	FLOOR-2		Date Received:	11/04/11
Sample Location:	CAMBRIDGE		Field Prep:	Not Specified
Matrix:	Solid		Extraction Method:	EPA 3540C
Analytical Method:	97,8082		Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 17:18		Cleanup Method1:	EPA 3665A
Analyst:	GT		Cleanup Date1:	11/08/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.		Cleanup Method2:	EPA 3660B
			Cleanup Date2:	11/08/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	1420	--	10
Aroclor 1221	ND		ug/kg	1420	--	10
Aroclor 1232	ND		ug/kg	1420	--	10
Aroclor 1242	ND		ug/kg	1420	--	10
Aroclor 1248	ND		ug/kg	943	--	10
Aroclor 1254	ND		ug/kg	1420	--	10
Aroclor 1262	ND		ug/kg	472	--	10
Aroclor 1268	ND		ug/kg	472	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-09	D	Date Collected:	11/02/11 00:00
Client ID:	FLOOR-2		Date Received:	11/04/11
Sample Location:	CAMBRIDGE		Field Prep:	Not Specified
Matrix:	Solid		Extraction Method:	EPA 3540C
Analytical Method:	97,8082		Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 17:18		Cleanup Method1:	EPA 3665A
Analyst:	GT		Cleanup Date1:	11/08/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.		Cleanup Method2:	EPA 3660B
			Cleanup Date2:	11/08/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	40400	B	ug/kg	943	--	10

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-10	Date Collected:	11/02/11 00:00
Client ID:	FLOOR-3	Date Received:	11/04/11
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 02:22	Cleanup Method1:	EPA 3665A
Analyst:	GT	Cleanup Date1:	11/08/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	11/08/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	62.1	--	1
Aroclor 1221	ND		ug/kg	62.1	--	1
Aroclor 1232	ND		ug/kg	62.1	--	1
Aroclor 1242	ND		ug/kg	62.1	--	1
Aroclor 1248	ND		ug/kg	41.4	--	1
Aroclor 1262	ND		ug/kg	20.7	--	1
Aroclor 1268	ND		ug/kg	20.7	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	48		30-150
Decachlorobiphenyl	34		30-150
2,4,5,6-Tetrachloro-m-xylene	55		30-150
Decachlorobiphenyl	46		30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-10	Date Collected:	11/02/11 00:00
Client ID:	FLOOR-3	Date Received:	11/04/11
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 02:22	Cleanup Method1:	EPA 3665A
Analyst:	GT	Cleanup Date1:	11/08/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	11/08/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1254	172		ug/kg	62.1	--	1
Aroclor 1260	265	B	ug/kg	41.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	48		30-150
Decachlorobiphenyl	34		30-150
2,4,5,6-Tetrachloro-m-xylene	55		30-150
Decachlorobiphenyl	46		30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-11	Date Collected:	11/02/11 00:00
Client ID:	FLOOR-4	Date Received:	11/04/11
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 02:35	Cleanup Method1:	EPA 3665A
Analyst:	GT	Cleanup Date1:	11/08/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	11/08/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	140	--	1
Aroclor 1221	ND		ug/kg	140	--	1
Aroclor 1232	ND		ug/kg	140	--	1
Aroclor 1242	ND		ug/kg	140	--	1
Aroclor 1248	ND		ug/kg	93.4	--	1
Aroclor 1262	ND		ug/kg	46.7	--	1
Aroclor 1268	ND		ug/kg	46.7	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	35		30-150
Decachlorobiphenyl	**22**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	36		30-150
Decachlorobiphenyl	**28**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

SAMPLE RESULTS

Lab ID:	L1118311-11	Date Collected:	11/02/11 00:00
Client ID:	FLOOR-4	Date Received:	11/04/11
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	11/07/11 11:30
Analytical Date:	11/09/11 02:35	Cleanup Method1:	EPA 3665A
Analyst:	GT	Cleanup Date1:	11/08/11
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	11/08/11

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1254	665		ug/kg	140	--	1
Aroclor 1260	336	B	ug/kg	93.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	35		30-150
Decachlorobiphenyl	**22**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	36		30-150
Decachlorobiphenyl	**28**	Q	30-150

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 11/09/11 11:18
Analyst: GT

Extraction Method: EPA 3540C
Extraction Date: 11/07/11 11:30
Cleanup Method1: EPA 3665A
Cleanup Date1: 11/09/11
Cleanup Method2: EPA 3660B
Cleanup Date2: 11/09/11

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-11 Batch: WG500555-1					
Aroclor 1016	ND		ug/kg	56.2	--
Aroclor 1221	ND		ug/kg	56.2	--
Aroclor 1232	ND		ug/kg	56.2	--
Aroclor 1242	ND		ug/kg	56.2	--
Aroclor 1248	ND		ug/kg	37.4	--
Aroclor 1254	ND		ug/kg	56.2	--
Aroclor 1260	16200	E	ug/kg	37.4	--
Aroclor 1262	ND		ug/kg	18.7	--
Aroclor 1268	ND		ug/kg	18.7	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	77		30-150
Decachlorobiphenyl	75		30-150
2,4,5,6-Tetrachloro-m-xylene	79		30-150
Decachlorobiphenyl	101		30-150

Lab Control Sample Analysis

Batch Quality Control

Project Name: P2814

Project Number: P2814

Lab Number: L1118311

Report Date: 11/17/11

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-11 Batch: WG500555-2 WG500555-3								
Aroclor 1016	79		**31**	Q	40-140	**87**	Q	30
Aroclor 1260	98		**32**	Q	40-140	**102**	Q	30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	88		20	Q	30-150
Decachlorobiphenyl	78		26	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	90		19	Q	30-150
Decachlorobiphenyl	124		25	Q	30-150

Project Name: P2814
Project Number: P2814

Lab Number: L1118311
Report Date: 11/17/11

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal

Cooler	
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1118311-01A	Glass 100ml unpreserved	A	N/A	3	Y	Absent	MCP-8082LL-10-3540C(365)
L1118311-02A	Glass 100ml unpreserved	A	N/A	3	Y	Absent	MCP-8082LL-10-3540C(365)
L1118311-03A	Glass 100ml unpreserved	A	N/A	3	Y	Absent	MCP-8082LL-10-3540C(365)
L1118311-04A	Glass 100ml unpreserved	A	N/A	3	Y	Absent	MCP-8082LL-10-3540C(365)
L1118311-05A	Glass 100ml unpreserved	A	N/A	3	Y	Absent	MCP-8082LL-10-3540C(365)
L1118311-06A	Glass 100ml unpreserved	A	N/A	3	Y	Absent	MCP-8082LL-10-3540C(365)
L1118311-07A	Glass 100ml unpreserved	A	N/A	3	Y	Absent	MCP-8082LL-10-3540C(365)
L1118311-08A	Glass 100ml unpreserved	A	N/A	3	Y	Absent	MCP-8082LL-10-3540C(365)
L1118311-09A	Glass 100ml unpreserved	A	N/A	3	Y	Absent	MCP-8082LL-10-3540C(365)
L1118311-10A	Glass 100ml unpreserved	A	N/A	3	Y	Absent	MCP-8082LL-10-3540C(365)
L1118311-11A	Glass 100ml unpreserved	A	N/A	3	Y	Absent	MCP-8082LL-10-3540C(365)

*Values in parentheses indicate holding time in days

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

GLOSSARY

Acronyms

EPA - Environmental Protection Agency.

LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

LCSD - Laboratory Control Sample Duplicate: Refer to LCS.

LFB - Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.

MDL - Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.

MSD - Matrix Spike Sample Duplicate: Refer to MS.

NA - Not Applicable.

NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.

NI - Not Ignitable.

RL - Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.

RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

SRM - Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A - Spectra identified as "Aldol Condensation Product".

B - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit.

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

E - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The RPD between the results for the two columns exceeds the method-specified criteria; however, the lower value has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

Report Format: Data Usability Report

Project Name: P2814 **Lab Number:** L1118311

Project Number: P2814 **Report Date:** 11/17/11

Data Qualifiers

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name: P2814 **Lab Number:** L1118311
Project Number: P2814 **Report Date:** 11/17/11

REFERENCES

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certificate/Approval Program Summary

Last revised September 19, 2011 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. ***NELAP Accredited Solid Waste/Soil.***

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP), Ethylene Dibromide (EDB), 1,4-Dioxane (Mod 8270). Microbiology Parameters: Total Coliform-MF mEndo (SM9222B), Total Coliform – Colilert (SM9223 P/A), E. Coli. – Colilert (SM9223 P/A), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D))

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, O-Phosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics, TPH (HEM/SGT), Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH. Microbiology Parameters: Total Coliform – MF mEndo (SM9222B), Total Coliform – MTF (SM9221B), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform – A-1 Broth (SM9221E).)

Solid Waste/Soil (Inorganic Parameters: pH, Sulfide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), SPLP Leach (1312 metals only), Reactivity. Organic Parameters: PCBs, PCBs in Oil, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH, Dicamba, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Volatile Organics, Acid Extractables (Phenols), 3.3'-Dichlorobenzidine, Phthalates, Nitrosamines, Nitroaromatics & Cyclic Ketones, PAHs, Haloethers, Chlorinated Hydrocarbons.)

Maine Department of Human Services Certificate/Lab ID: 2009024.
Drinking Water (Inorganic Parameters: SM9215B, 9222D, 9223B, EPA 180.1, 353.2, SM2130B, 2320B, 2540C, 4500Cl-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H+B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1, EPA 300.0. Organic Parameters: 504.1, 524.2.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, SM2320B, 2510B, 2540C, 2540D, 426C, 4500Cl-D, 4500Cl-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NH3-H, 4500NO3-F, 4500P-B, 4500P-E, 5210B, 5220D, 5310C, 9010B, 9040B, 9030B, 7470A, 7196A, 2340B, EPA 200.7, 6010, 200.8, 6020, 245.1, 1311, 1312, 3005A, Enterolert, 9223D, 9222D. Organic Parameters: 608, 8081, 8082, 8330, 8151A, 624, 8260, 3510C, 3630C, 5030B, ME-DRO, ME-GRO, MA-EPH, MA-VPH.)

Solid Waste/Soil (Inorganic Parameters: 9010B, 9012A, 9014A, 9040B, 9045C, 6010B, 7471A, 7196A, 9050A, 1010, 1030, 9065, 1311, 1312, 3005A, 3050B. Organic Parameters: ME-DRO, ME-GRO, MA-EPH, MA-VPH, 8260B, 8270C, 8330, 8151A, 8081A, 8082, 3540C, 3546, 3580A, 3630C, 5030B, 5035.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.
*Drinking Water (*Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl) (EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Fluoride, Sulfate); (EPA 353.2 for: Nitrate-N, Nitrite-N); (SM4500NO3-F for: Nitrate-N and Nitrite-N); 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, 2320B, SM2540C, SM4500H-B. Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics); (504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), EPA 332. Microbiology Parameters: SM9215B; ENZ. SUB. SM9223; ColilertQT SM9223B; MF-SM9222D.)

*Non-Potable Water (*Inorganic Parameters:, (EPA 200.8 for: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn); (EPA 200.7 for: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl, V,Zn); 245.1, SM4500H,B, EPA 120.1,

SM2510B, 2540C, 2340B, 2320B, 4500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia-N), LACHAT 10-107-06-1-B for Ammonia-N, SM4500NO3-F, 353.2 for Nitrate-N, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 5310C, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.
Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics),(608 for: Chlordane, Aldrin, Dieldrin, DDD, DDE, DDT, Heptachlor, Heptachlor Epoxide, PCBs-Water), (EPA 625 for SVOC Acid Extractables and SVOC Base/Neutral Extractables), 600/4-81-045-PCB-Oil. Microbiology Parameters: (ColilertQT SM9223B;Enterolert-QT: SM9222D-MF.)

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM 9222B, 9223B, 9215B, EPA 200.7, 200.8, 245.2, 300.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 332.0. Organic Parameters: 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 3005A, 200.7, 200.8, 245.1, 245.2, SW-846 6010B, 6020, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 350.2, 351.1, 353.2, 410.4, 420.1, 1664A, SW-846 9010, 9030, 9040B, SM426C, SM2120B, 2310B, 2320B, 2540B, 2540D, 4500H+B, 4500CL-E, 4500CN-E, 4500NH3-H, 4500NO3-F, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 5220D, 2510B, 2540C, 4500F-C, 5310C, 5540C, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D. Organic Parameters: SW-846 3510C, 3630C, 5030B, 8260B, 8270C, 8330, EPA 624, 625, 608, SW-846 8082, 8081A, 8151A.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 7196A, 7471A, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040B, 9045C, 9050C, 9065,1311, 1312, 3005A, 3050B. Organic Parameters: SW-846 3540C, 3546, 3550B, 3580A, 3630C, 5030B, 5035, 8260B, 8270C, 8330, 8151A, 8015B, 8082, 8081A.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9223B, 9215B, 4500CN-CE, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 200.8, 245.2, 2540C, SM2120B, 2320B, 2510B, 5310C, SM4500H-B. Organic Parameters: EPA 332, 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500Cl-E, EPA 300.0, SM2120B, SM4500F-BC, EPA 200.7, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM510ABC, SM4500P-B5+E, 2540B, 2540C, 2540D, EPA 120.1, SM2510B, SM15 426C, 9222D, 9221B, 9221C, 9221E, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, 350.2, SW-846 1312, 6020, 6020A, 7470A, 5540C, 4500H-B, EPA 200.8, SM3500Cr-D, 4500CN-CE, EPA 245.1, 245.2, SW-846 9040B, 3005A, 3015, EPA 6010B, 6010C, 7196A, 3060A, SW-846 9010B, 9030B. Organic Parameters: SW-846 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3510C, EPA 608, 624, 625, SW-846 3630C, 5030B, 8081A, 8081B, 8082, 8082A, 8151A, 8330, NJ OQA-QAM-025 Rev.7, NJ EPH.)

Solid & Chemical Materials (Inorganic Parameters: SW-846, 6010B, 6010C, 7196A, 3060A, 9010B, 9030B, 1010, 1030, 1311, 1312, 3005A, 3050B, 7471A, 7471B, 9014, 9012A, 9040B, 9045C, 9050A, 9065. Organic Parameters: SW-846 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3540C, 3545, 3546, 3550B, 3580A, 3630C, 5030B, 5035L, 5035H, NJ OQA-QAM-025 Rev.7, NJ EPH.)

New York Department of Health Certificate/Lab ID: 11148. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9223B, 9222B, 9215B, EPA 200.8, 200.7, 245.2, SM5310C, EPA 332.0, SM2320B, EPA 300.0, SM2120B, 4500CN-E, 4500F-C, 4500H-B, 4500NO3-F, 2540C, SM 2510B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222B, 9215B, 5210B, 5310C, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, SM4500CL-E, 4500F-C, SM15 426C, EPA 350.1, SM4500NH3-BH, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, LACHAT 10-107-04-1-C, SM4500-NO3-F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6020, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, LACHAT 10-204-00-1-A, EPA 9040B, SM4500-HB, EPA 1664A, EPA 420.1, SM14 510C, EPA 120.1, SM2510B, SM4500S-D, SM5540C, EPA 3005A, 9010B, 9030B.. Organic Parameters: EPA 624, 8260B, 8270C, 625, 608, 8081A, 8151A, 8330, 8082, EPA 3510C, 5030B.)

Solid & Hazardous Waste (Inorganic Parameters: 1010, 1030, EPA 6010B, 7196A, 7471A, 9012A, 9014, 9040B, 9045C, 9065, 9050, EPA 1311, 1312, 3005A, 3050B, 9010B, 9030B. Organic Parameters: EPA 8260B, 8270C, 8015B, 8081A, 8151A, 8330, 8082, 3540C, 3545, 3546, 3580, 5030B, 5035.)

North Carolina Department of the Environment and Natural Resources Certificate/Lab ID : 666. Organic Parameters: MA-EPH, MA-VPH.

Drinking Water Program Certificate/Lab ID: 25700. (Inorganic Parameters: Chloride EPA 300.0. Organic Parameters: 524.2)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. ***NELAP Accredited.***
Drinking Water (Organic Parameters: EPA 524.2, 504.1)

Non-Potable Water (Inorganic Parameters: EPA 1312, 200.7, 410.4, 1664A, SM2540D, 5210B, 5220D, 4500-P,BE. Organic Parameters: EPA 3510C, 3005A, 3630C, 5030B, 625, 624, 608, 8081A, 8082, 8151A, 8260B, 8270C, 8330)

Solid & Hazardous Waste (Inorganic Parameters: EPA 350.1, 1010, 1030, 1311, 1312, 3050B, 6010B, 7196A, 7471A, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065, SM 4500NH3-H. Organic Parameters: 3540C, 3545, 3546, 3550B**,** 3580A, 3630C, 5035, 8015B, 8081A, 8082, 8151A, 8260B, 8270C, 8330)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. ***NELAP Accredited via NY-DOH.***
Refer to MA-DEP Certificate for Potable and Non-Potable Water.
Refer to NJ-DEP Certificate for Potable and Non-Potable Water.

Texas Commisson on Environmental Quality Certificate/Lab ID: T104704476-09-1. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664, 200.7, 200.8, 245.1, 245.2, 300.0, 350.1, 351.1, 353.2, 376.2, 410.4, 420.1, 6010, 6020, 7196, 7470, 9040, SM 2120B, 2310B, 2320B, 2510B, 2540B, 2540C, 2540D, 426C, 4500CL-E, 4500CN-E, 4500F-C, 4500H+B, 4500NH3-H, 4500NO2B, 4500P-E, 4500 S2¯D, 510C, 5210B, 5220D, 5310C, 5540C. Organic Parameters: EPA 608, 624, 625, 8081, 8082, 8151, 8260, 8270, 8330.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1311, 1312, 9012, 9014, 9040, 9045, 9050, 9065.)

Department of Defense Certificate/Lab ID: L2217.
Drinking Water (Inorganic Parameters: SM 4500H-B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: EPA 200.7, 200.8, 6010B, 6020, 245.1, 245.2, 7470A, 9040B, 300.0, 332.0, 6860, 353.2, 410.4, 9060, 1664A, SM 4500CN-E, 4500H-B, 4500NO3-F, 5220D, 5310C, 2320B, 2540C, 3005A, 3015, 9010B, 9056. Organic Parameters: EPA 8260B, 8270C, 8330A, 625, 8082, 8081A, 3510C, 5030B, MassDEP EPH, MassDEP VPH.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 200.7, 6010B, 7471A, 9010, 9012A, 6860, 1311, 1312, 3050B, 7196A, 9010B, 3500-CR-D, 4500CN-CE, 2540G, Organic Parameters: EPA 8260B, 8270C, 8330A/B-prep, 8082, 8081A, 3540C, 3546, 3580A, 5035A, MassDEP EPH, MassDEP VPH.)

The following analytes are not included in our current NELAP/TNI Scope of Accreditation:
EPA 8260B: Freon-113, 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene. **EPA 8330A:** PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT. **EPA 8270C:** Methyl naphthalene, Dimethyl naphthalene, Total Methylnapthalenes, Total Dimethylnaphthalenes, 1,4-Diphenylhydrazine (Azobenzene). **EPA 625:** 4-Chloroaniline, 4-Methylphenol. Total Phosphorus in a soil matrix, Chloride in a soil matrix, TKN in a soil matrix, NO2 in a soil matrix, NO3 in a soil matrix, SO4 in a soil matrix.

CHAIN OF CUSTODY

PAGE 1 OF 2

ALPHA ANALYTICAL

WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193

MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 11/4/11

ALPHA Job #: L1118311

Client Information

Client: NOVER-ARMSTRONG ASSOCIATES

Address: 124 MAIN STREET UNIT 2G6

Phone: 508-866-8383

Fax: 508-866-9898

Email: mla@noverarmstrong.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: P2814

Project Location: SOMERVILLE

Project #: P2814

Project Manager: MLA

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: 11/11/11 Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL

☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program | Criteria

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?

☐ Yes ☐ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)

☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

If MS is required , indicate in Sample Specific Comments which samples and what tests MS to be performed.
(Note: All ***CAM*** methods for inorganic analyses require MS every 20 soil samples)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PCBs (3540C Soxhlet method)	Sample Specific Comments	TOTAL # BOTTLES
18311 1	WALL-1	11/2	AM		MLA	X		
2	WALL-2	11/2	AM		MLA	X		
3	WALL-3	11/2	AM		MLA	X		
4	WALL-4	11/2	AM		MLA	X		
5	WINDOW-1	11/2	AM		MLA	X		
6	WINDOW-2	11/2	AM		MLA	X		
7	WINDOW-3	11/2	AM		MLA	X		
8	FLOOR-1	11/2	AM		MLA	X		
9	FLOOR-2	11/2	AM		MLA	X		
10	FLOOR-3	11/2	AM		MLA	X		

SAMPLE HANDLING

Filtration
☐ Done
☐ Not needed
☐ Lab to do

Preservation
☐ Lab to do
(Please specify below)

Container Type	Glass
Preservative	None

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	11/4/11 12:30	P. Gillett	11/4/11 1230
P. Gillett	11/4/11 1550	[signature]	11/4/11 1550

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

Serial_No:11171114:42

CHAIN OF CUSTODY

PAGE 2 OF 2

ALPHA ANALYTICAL

WESTBORO, MA
TEL: 508-898-9220
FAX: 508-898-9193

MANSFIELD, MA
TEL: 508-822-9300
FAX: 508-822-3288

Date Rec'd in Lab: 11/4/11

ALPHA Job #: L1118311

Client Information

Client: NOVER-ARMSTRONG ASSOCIATES
Address: 124 MAIN STREE UNIT 2G6
Phone: 508-866-8383
Fax: 508-866-9898
Email: mla@novearmstrong.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: P2814
Project Location: SOMERVILLE
Project #: P2814
Project Manager: MLA
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: 11/11/11 Time:

Report Information - Data Deliverables

☐ FAX ☑ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program | Criteria

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☐ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☐ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

If MS is required , indicate in Sample Specific Comments which samples and what tests MS to be performed.
(Note: All ***CAM*** methods for inorganic analyses require MS every 20 soil samples)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ANALYSIS: PCBs (3540C) soxhlet method	Sample Specific Comments	TOTAL # BOTTLES
18311.11	FLOOR-4	11/2	AM		MLA	X		

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Container Type: Glass
Preservative: None

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT (MA MCP) or CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
P. Gilbert	11/4/11 1230	P. Gilbert	11/4/11 1230
P. Gilbert	11/4/11 1550	Jan Chuang	11/4/11 1550

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

Serial No:11171114:42

CHAIN OF CUSTODY

PAGE 1 OF 2

ALPHA ANALYTICAL

WESTBORO, MA
TEL: 508-898-9220
FAX: 508-898-9193

MANSFIELD, MA
TEL: 508-822-9300
FAX: 508-822-3288

Date Rec'd in Lab: 11/4/11

ALPHA Job #: L1118311

Client Information

Client: NOVER-ARMSTRONG ASSOCIATES
Address: 124 MAIN STREET UNIT 2G6
Phone: 508-866-8383
Fax: 508-866-9898
Email: mla@noverarmstrong.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: P2814
Project Location: SOMERVILLE CAMBRIDGE
Project #: P2814
Project Manager: MLA
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: 11/11/11 Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program | Criteria

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☐ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

If MS is required, indicate in Sample Specific Comments which samples and what tests MS to be performed.
(Note: All *CAM* methods for inorganic analyses require MS every 20 soil samples)

ANALYSIS: PCBs (3540 Soxhlet method)

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PCBs (3540 Soxhlet method)	Sample Specific Comments	Total # Bottles
18311 1	WALL-1	11/2	AM		MLA	X		
2	WALL-2	11/2	AM		MLA	X		
3	WALL-3	11/2	AM		MLA	X		
4	WALL-4	11/2	AM		MLA	X		
5	WINDOW-1	11/2	AM		MLA	X		
6	WINDOW-2	11/2	AM		MLA	X		
7	WINDOW-3	11/2	AM		MLA	X		
8	FLOOR-1	11/2	AM		MLA	X		
9	FLOOR-2	11/2	AM		MLA	X		
10	FLOOR-3	11/2	AM		MLA	X		

Container Type: Glass
Preservative: None

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
[illegible]	11/4/11 12:30	P. Gillet	11/4/11 1230
P. Gillet	11/4/11 1550	[illegible]	11/4/11 1550

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

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CHAIN OF CUSTODY

PAGE 2 OF 2

ALPHA ANALYTICAL

WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193

MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 11/9/11

ALPHA Job #: L1118311

Client Information

Client: NOVER-ARMSTRONG ASSOCIATES

Address: 124 MAIN STREE UNIT 2G6

Phone: 508-866-8383

Fax: 508-866-9898

Email: mla@novearmstrong.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: P2814

Project Location: ~~SOMERVILLE~~ CAMBRIDGE

Project #: P2814

Project Manager: MLA

ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: 11/11/11 Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL

☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program | Criteria

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☐ Yes ☐ No Are MCP Analytical Methods Required?

☐ Yes ☐ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)

☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

If MS is required , indicate in Sample Specific Comments which samples and what tests MS to be performed.
(Note: All *CAM* methods for inorganic analyses require MS every 20 soil samples)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	PCBs (3540C) soxlet method	Sample Specific Comments	TOTAL # BOTTLES
18311 11	FLOOR-4	11/2	AM		MLA	X		

SAMPLE HANDLING

Filtration
☐ Done
☐ Not needed
☐ Lab to do

Preservation
☐ Lab to do
(Please specify below)

Container Type	Glass
Preservative	None

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT (MA MCP) or CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	11/4/11 1230	P. Gilbert	11/4/11 1230
P. Gilbert	11/4/11 1550	[signature]	11/4/11 1550

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

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Serial No:11111116:43

APPENDIX B

NOVER-ARMSTRONG ASSOCIATES, INC.

124 Main Street, Unit 2GG
Carver, Massachusetts 02330
Telephone 508.866.8383
Facsimile 508.866.9898

SDO-certified DBE & WBE
www.noverarmstrong.com

environmental consultants & engineers

SITE-SPECIFIC QAPP ADDENDUM A1

for

Analysis of PCBs in Building Materials
MBTA Tire Maintenance Facility
21 Water Street / 183 Monsignor O'Brien Highway
Cambridge, Massachusetts

EPA QA RFA 11102

Prepared by: Nover-Armstrong Associates, Inc. (Nover-Armstrong)
124 Main Street, Unit 2GG, Carver, MA 02330
Matthew Alger, Nover-Armstrong Quality Assurance Coordinator

Date Prepared: June 2012 (Revision 1.2)

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List of Acronyms

ASTM	American Society for Testing Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGI	Combustible Gas and Oxygen Detector
COC	Chain of Custody
COPC	Contaminant of Potential Concern
DEP	Department of Environmental Protection
DOD	Department of Defense
DQO	Data Quality Objectives
EHP	Environmental Health Program
ELAP	Environmental Laboratory Accreditation Program
EMD	Environmental Monitoring Database
EPA	Environmental Protection Agency
FID	Flame ionization detector
FSS	Federal Sites Section of the Hazardous Waste Remediation Bureau
HASP	Health and Safety Plan
ID	Inside Diameter
LFS	Low Flow Sampling
MCL	Massachusetts Certified Lab
MCP	Massachusetts Contingency Plan
MDL	Method Detection Limits
NAPL	Non-Aqueous Phase Liquid
NCP	National Contingency Plan
NIST	National Institute of Standard & Technology
NELAC	National Environmental Laboratory Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NPL	National Priorities List
NTU	Nephelometric Turbidity Units
OD	Outside Diameter
ORCB	Oil Remediation & Compliance Bureau
ORP	Oxygen Reduction Potential
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PEHB	Permitting & Environmental Health Bureau
PIC	Public Information Center
PID	Photoionization Detector
PM	Project Manager
POE	Point of Entry
PQO	Project Quality Objectives
PRP	Potentially Responsible Party
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAC	Quality Assurance Coordinator
QAM	Quality Assurance Manager
QAPP	Quality Assurance Project Plan
QC	Quality Control

List of Acronyms - Continued

QMP	Quality Management Plan
QSM	Quality Systems Manual
RDL	Reporting Detection Limits
RI/FS	Remedial Investigation and Feasibility Study
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SOP	Standard Operation Procedure
SRP	Site Remediation Program
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds
WMD	Waste Management Division

Section 1 – Project Management

1.1 Introduction

The Brownfields Revitalization and Environmental Restoration Act of 2001 authorizes federal funding for the assessment and cleanup of contaminated properties through the USEPA's Brownfields grant program. The USEPA requires that a Quality Assurance Project Plan (QAPP) is prepared and approved by the USEPA prior to the commencement of federally funded projects involving the collection and use of environmental data.

This Site-Specific QAPP Addendum has been prepared in accordance the USEPA's Brownfields program. Assessment activities will be completed consistent with USEPA requirements and processes described in Massachusetts General Laws Chapter 21E (MGL Ch. 21E) and 310 Code of Massachusetts Regulations (CMR) 40.0000 – Massachusetts Contingency Plan (MCP).

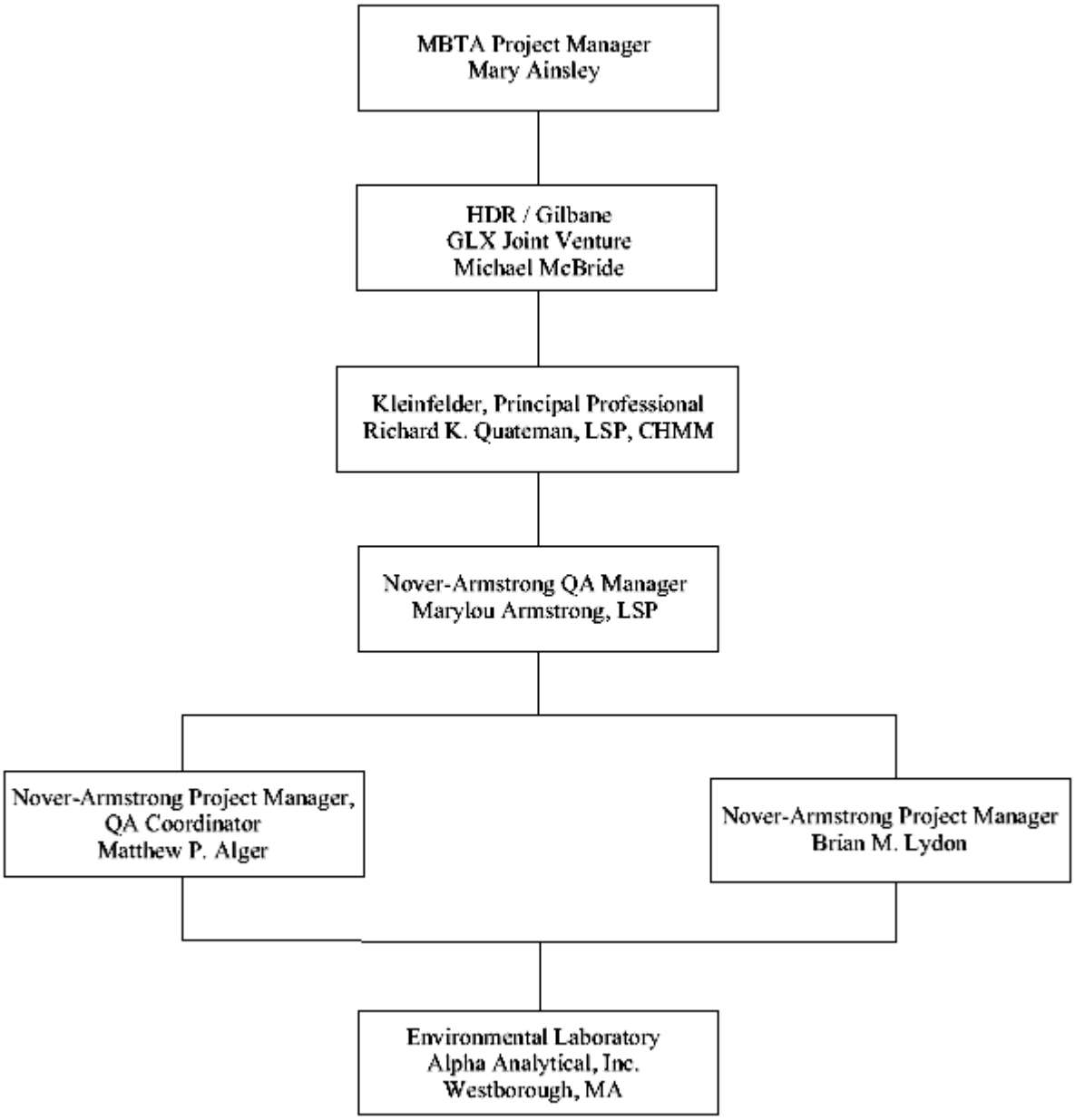
Site-Specific QAPP Addendum A1, Revision 1.2 (June 2012) for the MBTA Tire Maintenance Facility has been prepared in association with the *Generic Quality Assurance Project Plan for Nover-Armstrong Associates, Inc., Revision 1.1 (July 2011)*, RFA 11102, which was approved by the USEPA in August 2011. The work described in this Site-Specific QAPP Addendum will be performed in accordance with the processes and procedures described in the Generic QAPP.

This Site-Specific QAPP Addendum has been prepared to ensure that all sample collection and data generation activities associated with the current project yield data that are of adequate quality for their intended use.

1.2 Project Organization and Responsibility

Figure 1-1 represents a graphic illustration of the project organization and communication pathways. These are considered to be general pathways of communication and do not restrict communication between all parties, as necessary.

Figure 1-1: Project Organizational Chart



- The Quality Assurance Manager (QAM) is the key Nover-Armstrong individual responsible for quality assurance (QA). The QAM is a company Principal and communicates directly with the QA Coordinator (QAC).
- The QA Coordinator reports to the QA Manager and is the liaison between the QA Manager and all other Nover-Armstrong personnel. The QA Coordinator reviews analytical reports received from state-certified laboratories for quality control.

- The Nover-Armstrong Principals interact directly with the Project Managers, the QA Coordinator, and the QA Manager.
- The Project Managers report to the Principals and coordinate activities with the QA Coordinator and QA Manager.
- The analytical laboratory sends reports to the QA Coordinator, after having audited the results in accordance with their Standard Operation Procedures (SOPs).

Nover-Armstrong field sampling personnel shall have received training in accordance with Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 (e) including annual refresher courses. All training shall be documented. Training records shall be maintained by the employer of the staff and be available upon request. Standard safety practices shall be employed, and appropriate protective clothing shall be worn during all site visits.

Appropriate and effective health and safety practices shall be integrated into all daily operations to promote safe and healthful working conditions. At minimum, procedures shall comply with OSHA and other applicable local, State, and federal laws and regulations.

1.3 Problem Definition

The Green Line Extension Project (GLX) will provide light rail service from the relocated Lechmere Station using a two-branch operation. The existing Lechmere Station, the terminus of the existing alignment, will be relocated to 21 Water Street / 183 Monsignor O'Brien Highway in Cambridge, the current location of the MBTA Tire Maintenance Facility (the site). The current site building will be demolished as part of the project. Refer to Figure 1-2: Site Location.

Nover-Armstrong completed an Initial Hazardous Materials Survey at the site in November 2011. The MBTA Tire Maintenance Facility consists of an approximate 11,914 square foot concrete block building that is scheduled to be demolished as part of the GLX project. The site is currently owned by the Massachusetts Bay Transportation Authority (MBTA). As part of the Initial Hazardous Materials Survey, building materials were inspected for potential presence of polychlorinated biphenyls (PCBs). Visual inspection revealed window caulking, floor caulking, wall caulking, and wall mortar that were considered potential PCB sources. There are forty (40) windows throughout the facility. Building materials were observed to be in poor to good condition, with areas of isolated damage. The building material samples were submitted to Alpha Analytical, Inc. (Alpha) and analyzed for PCBs via EPA Method 3540C (Soxhlet Extraction Method).

Concentrations of PCBs were detected in all window caulking samples, all floor caulking samples, one wall caulking sample, and two of three wall mortar samples. PCB concentrations ranged from 110,000 parts per million (ppm) to 993,000 ppm in the window caulking samples. Lower PCB concentrations ranging from 0.172 ppm to 40.4 ppm were detected in floor caulking, wall caulking, and wall mortar samples.

Review of the analytical laboratory report revealed that 16.2 ppm PCBs was also detected in the Method Blank sample. Nover-Armstrong contacted Glen Breland of Alpha relative to the detection of PCBs in the Method Blank. Mr. Breland stated that the Method Blank was run as part of the sample batch. During the soxhlet extraction and / or blow down process, the Method Blank (and potentially some of the building material samples) was contaminated from the window caulking samples containing very high PCB concentrations run at the beginning of the batch. Therefore, samples containing less than 16 ppm PCBs may not contain PCBs or may have concentrations less than the concentrations reported by Alpha

in their laboratory report. A screening process will be used by Alpha for samples collected as part of this Site-Specific QAPP Addendum to identify samples with high PCB concentrations prior to Soxhlet extraction in order prevent cross-contamination. This screening process is described further in Section 2.9 and Appendix A.

Analytical results revealed window caulking, floor caulking, wall caulking, and wall mortar containing PCB concentrations. Nover-Armstrong recommended additional assessment of building materials and ground surfaces surrounding the windows and surrounding impacted floor and wall samples, per TCSA requirements. Due to the detection of PCBs within the Method Blank sample, Nover-Armstrong recommended re-sampling and analysis of the building materials with PCB concentrations between 1 and 50 ppm to determine / confirm the presence of PCBs.

Site-Specific QAPP Addendum A1 is being implemented for the analysis of PCBs in concrete masonry units (CMU) surrounding the windows of the facility and in building materials (concrete, caulking, and mortar) surrounding impacted floor and wall samples. The goal of this project is to identify potential PCB impacts from window caulking, floor caulking, wall caulking, and/or wall mortar leaching into building materials adjacent to the previously-identified PCB-impacted areas and to assess the limits of PCB contamination, if identified. Additional assessment and/or remediation work may be required based on the outcome of this project. One or more QAPP Addenda will be prepared for any such additional work (if required). Potential additional assessment of ground surfaces surrounding the windows will be addressed in a separate Site-Specific QAPP Addendum, if required.

1.4 Project Description and Timeline

Project Description

In accordance with EPA Protocols, Nover-Armstrong will conduct concrete sampling & analysis to assess limits of PCB contamination in CMUs surrounding building windows and in building materials (concrete, caulking, and mortar) surrounding impacted floor and wall samples.

- Ten windows to be sampled (representing 25 % of windows).
- Eight samples per window area will be obtained using EPA Sampling Protocols (including Level C PPE). Samples will be obtained from all four sides of each window at a distance from the window equaling approximately one-half of a CMU length.
- Four samples will be obtained using EPA Sampling Protocols from areas surrounding each of four building material sampling locations previously identified during the November 2011 Initial Hazardous Materials Survey as containing PCBs. These samples were identified as WALL-1, WALL-3, WALL-4, and FLOOR-2. Samples will be obtained from all four sides of each location at a distance of six to twelve inches.
- A minimum of 96 samples will be analyzed for PCBs (Soxhlet Method – SW846 3540C/8082).
- Up to ten additional samples may be collected and analyzed, as deemed appropriate based on field observations, along cracked, rusted areas in line with the windows to assess for potential PCB migration through the concrete.
- No field screening will be performed.
- Sampling equipment will be decontaminated between sample collections.
- Up to six Duplicate Samples (frequency of 1 duplicate per 20 samples) & six Equipment Blanks (frequency of 1 blank per 20 samples or 1 blank per day, whichever is more frequent) will be collected for QA/QC purposes.
- Analytical results will be compared against applicable USEPA regulatory standards.

- Soil surfaces outside of the building will be visually inspected to evaluate the potential presence of visible caulk waste (pieces / debris) and/or caulk paint waste (chips / flakes). This visual inspection information, along with the analytical data, may be used to assess whether PCBs weeping out of the caulk and/or deteriorating caulk materials could have reached the soil outside of the building.

Timeline

Building Material Sampling / Analysis for PCBs (Field Activities)	July 9-13, 2012
Laboratory Analytical Results Available for Review	July 20, 2012
Written Deliverable with Results & Findings	July 27, 2012

Section 2 – Measurement Data Acquisition

2.1 Sampling Design and Site Figures

CMUs Surrounding Windows

As outlined in Section 1.4, Nover-Armstrong will collect concrete samples from CMUs adjacent to selected windows at the site. The samples will be collected in ten groups (Groups A through J), as depicted in Figure 2-1. Each group is comprised of eight grab sampling points. The spatial distribution of samples collected from CMUs surrounding individual windows is depicted in Figure 2-2. The samples will be obtained from all four sides of each window at a distance from the window equaling approximately one-half of a CMU length. As noted in Section 1.4, up to ten additional samples may be collected, as deemed appropriate based on field observations, along cracked, rusted areas in line with the windows to assess for potential PCB migration through the concrete.

The concrete samples will obtained following the guidance provided in the USEPA Region 1 *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs), Revision 4 (May 2011), EIASOP_POROUSSAMPLING* and in accordance with the Code of Federal Regulations (CFR) 40 CFR 761 . Refer to Appendix A – Standard Operating Procedures.

A rotary impact hammer equipped with a one-inch diameter carbide drill bit will be used to generate a fine concrete powder, which will be collected into appropriate containers provided by the laboratory. Samples will be collected from each sampling location at a depth of 0-1.0 inch into the exterior concrete wall surface. Samples will be collected at ½-inch depth intervals. Thus, the initial surface sample will be collected from 0-0.5 inches. The second sample will be collected from 0.5-1.0 inches. A ½-inch deep hole generates approximately 10 grams (20 mL) of powder. According to Ms. Leslie Coon of Alpha, a minimum of approximately 50 grams of concrete powder is required for PCB and total solids analysis. Therefore, two to three 1-inch holes located closely adjacent to each other will be needed to generate sufficient sample volume for a PCB determination. Level C Personal Protective Equipment (PPE) will be utilized during sampling activities to minimize exposure to concrete dust.

A total of up to 90 concrete grab samples from surrounding the windows, not including field quality control samples, will be submitted for laboratory analysis of PCBs (Soxhlet Extraction Method – SW846 3540C/8082).

Building Materials Surrounding Previously-Identified PCB-Impacted Sample Locations

As outlined in Section 1.4, Nover-Armstrong will collect four samples from areas surrounding each of four building material sampling locations previously identified during the November 2011 Initial Hazardous Materials Survey as containing PCBs. These samples were identified as WALL-1, WALL-3, WALL-4, and FLOOR-2. Refer to Figure 2-3 for sampling locations. The samples will be obtained from all four sides of each sampling location at a horizontal distance of six inches from the previous (November 2011) sample, except for two floor caulking samples collected from the floor seam near FLOOR-2, which will be obtained at a horizontal distance of twelve inches from the November 2011 sample. The building material samples will consist of concrete, caulking, or mortar, depending on the sampling location.

The building material samples will obtained following the guidance provided in the USEPA Region 1 *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs), Revision 4 (May 2011), EIASOP_POROUSSAMPLING* and in accordance with the Code of Federal Regulations (CFR) 40 CFR 761 . Refer to Appendix A – Standard Operating Procedures.

For concrete and mortar samples, a rotary impact hammer equipped with a one-inch diameter carbide drill bit will be used to generate a fine concrete and/or mortar powder, which will be collected into appropriate containers provided by the laboratory. Samples will be collected from each sampling location at a depth of 0-1.0 inch into the wall and/or floor surface. Samples will be collected at ½-inch depth intervals, as described above, to generate approximately 50 grams of concrete and/or mortar powder for analysis. Level C Personal Protective Equipment (PPE) will be utilized during sampling activities to minimize exposure to concrete and/or mortar dust.

For caulking samples, a chisel or sharp knife will be used to generate representative samples.

A total of up to 16 grab samples from surrounding the previously-identified PCB-impacted sample locations, not including field quality control samples, will be submitted for laboratory analysis of PCBs (Soxhlet Extraction Method – SW846 3540C/8082).

2.2 Sampling and Analytical Methods Requirements

Table 2-1 lists the Sampling and Analytical Methods Requirements table that will be used for this site-specific QAPP addendum. The table is designed to provide a detailed summary of samples being collected for the project. Refer to Appendix A – Standard Operating Procedures.

Table 2-1: Sampling and Analytical Methods Requirements Table

Sample Description			QA/QC		SOPs			Container			Preservation	
Parameter	**Matrix**	**Samples**	**Dupl.**	**Equip. Blank**	**Field Sampling SOP**	**Method**	**Lab SOP**	**#**	**Size**	**Type**	**Sample Preservation**	**Hold Time**
Polychlorinated Biphenyls (PCBs)	Concrete Powder	106	6	6	EIASOP_ POROUS SAMPLI NG	Soxhlet Method – SW846 3540C/ 8082	1954; 2129	1	120 mL	Glass Jar w/ Teflon-lined cap	4º C	None

2.3 Method and SOP Reference Table

Table 2-2: Site-Specific Method and SOP Reference Table

SOP Number	Procedure Name	Revision Number	Revision Date	SOP Author	Analytical Method Name	Analytical Method Number	Method Revision Number	Method Revision Date
EIASOP_POROUSSAMPLING	Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs)	4	05.2011	USEPA	N/A	N/A	N/A	N/A
SOP.NAA_C.01.1	Field Documentation	1	07.2011	Nover-Armstrong Assoc., Inc.	N/A	N/A	N/A	N/A
SOP.NAA_C.05.1	Equipment Decontamination	1	07.2011	Nover-Armstrong Assoc., Inc.	N/A	N/A	N/A	N/A
SOP.NAA_C.07.1	Chain of Custody Sample Handling & Shipping	1	07.2011	Nover-Armstrong Assoc., Inc.	N/A	N/A	N/A	N/A
2129	PCBs by Capillary Column Gas Chromatography	2	4.27.2012	Alpha Analytical, Inc.	PCBs by Capillary Column Gas Chromatography	USEPA SW-846 Method 8082	Update III	1997
1954	Soxhlet Extraction	2	5.10.2012	Alpha Analytical, Inc.	Soxhlet Extraction	USEPA SW-846 Method 3540C	Update III	1997

Notes: N/A - Not Applicable

2.4 Field Equipment Calibration and Corrective Action

Table 2-3 lists the equipment needed for Site-Specific QAPP Addendum A1. The field equipment that will be used for the building material sampling does not require calibration. The impact hammer will be checked on a daily basis to ensure proper function. The PPE will be inspected before and after each use to ensure its integrity and effectiveness. Sampling equipment shall be cleaned (decontaminated) before use to minimize the potential for cross-contamination and whenever possible, new/unused sampling equipment shall be utilized.

Table 2-3: Field Equipment List

Equipment Type	Model
Makita 6 Amp 5/8" Hammer Drill	HP1640
Dewalt Premium Percussion 1" x 12" Carbide Drill Bit	DW5249
Hilti TE-C ½" Carbide Hammer Drill Bit	385080
North Safety Silicone Half Mask	7700 Series
North Safety Air-purifying Filters	7580P100
Spoon, chisel & knife (for sample collection)	N/A
Decontamination supplies	Refer to SOP.NAA_C.05.1

All pertinent manufacturers' equipment manuals and any manufacturer-provided repair kits will be on-site at all times during the sampling event. All instrumentation necessary for health and safety purposes shall be maintained, tested and inspected according to the manufacturer's instructions.

See Appendix A for the Nover-Armstrong Decontamination SOP (SOP.NAA_C.05.1) and the guidelines for decontamination provided in the USEPA SOP (EIASOP_POROUSSAMPLING). Disposable sampling equipment shall be discarded after completing the sampling task and not reused. Decontamination of equipment will generate potentially contaminated rinse liquids that will need to be containerized on-site until proper disposal arrangements are made. The rinse liquids will be stored at the site in an industrial-type 55-gallon DOT-approved steel drum secured with a locking bolt ring. The rinse liquids will be tested prior to off-site disposal to determine if they must be transported to a hazardous waste facility. If it is determined that the rinse liquids are not contaminated, they will be disposed of on-site.

The rinse liquids will be tested at the conclusion of the sampling event (approximate three to five day duration). Analytical turnaround time for the rinse liquid sample will be ten business days. Following receipt of analytical results, the rinse liquids will either be disposed on-site or approval will be obtained for acceptance at a disposal facility. A licensed waste disposal contractor will be hired to transport the rinse liquids to the disposal facility. Therefore, the rinse liquids could remain on-site for up to one month from generation to disposal.

2.5 Laboratory Equipment Calibration and Corrective Action

The SOPs provided in Appendix A contain the laboratory equipment calibration QA/QC information.

2.6 Sample Handling and Custody Requirements

The USEPA Region 1 *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs), Revision 4 (May 2011), EIASOP_POROUSSAMPLING*, which is provided in

Appendix A contains detailed sample handling instructions for the building material samples that will be collected by Nover-Armstrong for PCB analysis.

Analytical services shall be provided by Alpha Analytical, Inc. (Alpha) of Westborough, MA. Alpha is currently accredited under the National Environmental Laboratory Accreditation Conference (NELAC) standards and has its own quality assurance manual and standard operating procedures (SOPs) that meet the NELAC standards. Alpha is accredited for the specific matrix / method / analyte for which testing is required and maintains its own separate quality assurance manual.

The building material samples will be collected into 120 mL amber jars with teflon-lined caps. Containers shall be obtained from the analytical lab and shall be clean and free of contamination. The jars will not contain chemical preservatives. Care shall be taken during sampling to ensure that material is not spilled onto the outer surface of containers, and that lids are placed on tightly after sampling. At least 50 grams of sample material will be collected, in accordance with laboratory requirements. Containers shall be labeled with the date and time sampled, sample location, collectors initials, sample number, project name or number, preservative and any other pertinent information. Information shall be documented in field notebooks/worksheets and chain of custody forms. Alpha does not require sample preservation or a specific holding time for samples being analyzed for PCBs; however, the laboratory does require samples to be cooled to 4°C using ice prior to delivery. Refer to Section 2.2, Table 2-1 Sampling and Analytical Methods Requirements Table.

See Appendix A for the Nover-Armstrong Chain of Custody Sample Handling & Shipping SOP (SOP.NAA_C.07.1). Samples and empty sample containers shall remain in the sample collector's view at all times, unless locked in a vehicle or other secure place. It is the sampler's responsibility to ensure that the samples are not tampered with prior to their delivery to the analytical lab. The Chain of Custody (COC) form shall be completed to provide documentation tracing sample possession and handling from the time of collection through delivery to the analytical lab, and shall accompany the samples at all times. The COC is a legal document that may be used for litigation purposes. The current COC used by Alpha is attached within the Chain of Custody Sample Handling & Shipping SOP in Appendix A. The completed original COC shall be attached to the analytical report which is submitted to Nover-Armstrong, and becomes part of the permanent project record.

Samples shall be properly packaged in a cooler for shipment to maintain sample integrity and delivered to the analytical laboratory along with a separate signed COC form enclosed in each sample cooler. As noted, samples will be cooled to approximately 4°C using ice prior to delivery to the analytical laboratory.

Lab personnel shall log the samples into their computer in accordance with their standard operating procedure. The samples shall be inspected by qualified laboratory personnel. A Sample Receipt Checklist shall be used to document the receipt of the samples and shall include checks for breakage, correct container, temperature of the cooler, holding times, and for other factors that may affect quality. The samples shall be compared to their description on the COC form, and discrepancies in the number or the designations of the samples shall be noted on the form and shall be brought to the attention of the person who relinquished the samples to the lab. If necessary, the contact person on the chain of custody may be contacted for further instruction. Since samples may be held in the lab untouched until discrepancies are resolved, there could be an impact on sample holding times.

The COC form shall be signed and the date and time shall be recorded to formally accept the samples into laboratory custody. The analytical laboratory shall assign laboratory numbers to the samples, and these numbers shall be recorded on the chain of custody forms.

2.7 Analytical Sensitivity and Project Criteria

Refer to Appendix B for an Analytical Method Sensitivity and Project Criteria Table for analytical methods that are routinely performed by Alpha, including the methods that will be utilized for this project. The table includes routine analytes, MDLs, RDLs, regulatory standards, etc. As of the date of this site-specific QAPP addendum, the current state and/or federal standards have been incorporated into this table and the reporting limits and standards have been reviewed for accuracy.

2.8 Field Quality Control Requirements

The following are field quality control samples that will be utilized for this project:

- Equipment Blanks

  Equipment blanks consist of a sample of distilled/deionized (analyte-free) water which has been poured around and through sample collection equipment to determine if contamination has occurred due to improper cleaning and/or contamination of equipment. They shall be handled like any other sample and submitted with the other samples for analysis. The frequency shall be one equipment blank per 20 samples collected or one equipment blank per day sampling, whichever is more frequent.

- Duplicate samples

  Duplicate samples shall be collected for each batch of samples collected per matrix, per analysis. A batch is a sample delivery group that is analyzed together (a batch may not exceed 20 samples). The duplicates shall be collected at the same time, in the same manner as their corresponding routine samples and shall be identified in the field notes and logged on the chain of custody forms.

Table 2-4: Field Quality Control Requirements Table

QC Sample	Frequency	Acceptance Criteria	Corrective Action
Field Duplicate	1 duplicate per batch 20 samples	Duplicate concentrations are within +/- 50% for solid samples	Flag in project report
Equipment Blank	1 equipment blank per batch 20 samples or 1 equipment blank per day sampling, whichever is more frequent	No contaminants are detected	Flag in project report

Notes:

- Duplicate samples are not intended to be blind duplicate samples. They will be designated with a “DUP” after the sample designation (i.e. CMU-1_DUP).

- Equipment blank samples will be designated as "EQUIP BLANK". Note that a comment is required on the chain of custody indicating what the equipment blank is for (i.e. impact hammer drill bit).

2.9 Laboratory Quality Control Requirements

The SOPs provided in Appendix A contain the laboratory quality control procedures routinely performed for each parameter and matrix. A screening process will be used by Alpha for samples collected as part of this Site-Specific QAPP Addendum to identify samples with high PCB concentrations prior to Soxhlet extraction in order prevent cross-contamination.

2.10 Data Management and Documentation

All Nover-Armstrong Project Managers will be required to review this site specific QAPP addendum and sign the "QAPP Project Personnel Log Sheet" which documents that they have reviewed this QAPP and will follow the procedures as described. The "QAPP Project Personnel Log Sheet" is found in Appendix C.

Field personnel shall use field logbooks and/or pre-printed work sheets to accurately document all field activities: on-site conditions; field measurements; sample collection information; field instrument and calibration information; and other pertinent site-related information during monitoring activities. Refer to Appendix A for Nover-Armstrong's Field Documentation SOP (SOP.NAA_C.01.1). The field notes shall include a description of field conditions that includes, as a minimum:

- Site location;
- Date, start, and finish times of the work and weather conditions;
- Name and initials of person making entry;
- Names of other personnel present, if any;
- Names of visitors, if any;
- Purpose and summary of proposed work effort;
- Details of any deviation from the field operations plan or standard operating procedures, including who authorized the deviation;
- Field observations;
- Sampling equipment used (including make model and serial number);
- Fixed laboratory sample identification number, sample type (grab), time of sampling, sample analysis, and sample locations shown on a near-scale map relative to a fixed landmark;
- Sample handling, packaging, labeling, and shipping information (including destination);
- Location, description and unique identifier for all photographs taken in association with the field activity; and
- Any other pertinent information.

Information recorded in other site documents, *e.g.*, sampling logs, will not be repeated in logbooks except in summary form. Any corrections to the logbook or other written documentation shall be initialed and dated. All corrections shall be shown as a single line through the original. The unused bottom portion of each page shall be lined-out, initialed, and dated.

All site related reports and project plans including QAPPs, laboratory reports, site sampling reports, and annual reports shall be submitted and maintained in electronic project files and reviewed by the appropriate Project Manager to evaluate the usability of the data and assure compliance with the elements of this QAPP.

All electronic copies of company files are saved on the Nover-Armstrong server as they are generated. The data on the server is backed up daily and retained indefinitely.

Section 3 – Assessment and Oversight

3.1 Assessments and Response Actions

Data Assessment

All data generated shall be reviewed by the contractor and the Project Manager to ensure that the data has met the objectives and requirements of this QAPP and that the results are technically valid, reliable, and usable. Sampling and analytical results shall be reviewed to determine if:

- Corrective action is necessary;
- The sampling plan should be revised; or
- The site should be re-sampled.

In order to ensure that the data has met the objectives and requirements of this QAPP and that the results are technically valid, reliable and usable, data shall be reviewed and compared with relevant documentation such as:

- Available Historical data;
- Laboratory MDL and RDL;
- Standards established by the MassDEP and EPA;
- Current MassDEP and EPA policies; and
- Other pertinent documents as needed.

If data of questionable quality is reported or other quality control issues are uncovered, the Project Manager shall report the issues to the QA Coordinator and/or QA Manager. The Project Manager, with input from quality assurance personnel, shall determine the usefulness of data in question and at minimum shall summarize that data concerns in the report for which the data was generated.

The need for corrective action, including the collection of new or additional samples, shall be determined based on the data quality objectives for the project and with input from quality assurance and other appropriate personnel.

The laboratories provide the necessary Analytical Method Report Certification Forms, case narratives, and QA/QC data reporting. The lab certifies that the required QA/QC procedures were followed, and all performance/acceptance standards for the required QA/QC procedures were achieved or discussed.

It is the Project Manager's responsibility to ensure that all sampling procedures and techniques are conducted in accordance with the QAPP and any site specific QAPPs. This can best be assured by the use of field audits.

Nover-Armstrong quality assurance personnel shall periodically conduct separate field audits, review field methods, analytical procedures and/or document tracking and record keeping practices, to assure compliance with the elements of this QAPP.

Corrective Action

Corrective actions must be taken as soon as possible when data or field procedures are found to be of questionable quality. Any suspected problems shall be brought to the attention of the Nover-Armstrong Project Manager and the QA Coordinator.

The need for corrective action may be identified in many ways. The corrective action steps are:

- Identification and definition of the problem;
- Investigation of the problem;
- Determination of the cause of the problem and appropriate corrective action (this may include the need for additional training);
- Implementation of the corrective action;
- Verification that the problem has been corrected;
- Modification of procedures, as necessary, to prevent recurrence; and document the events.

3.2 Project Reports

Technical reports documenting the findings of site sampling work shall be generated by Nover-Armstrong. One technical report detailing the analytical results for PCBs in CMUs surrounding the windows of the facility will be generated for Site-Specific QAPP Addendum A1.

The report will include the following information:

- Summary of sampling activities;
- A copy of the complete laboratory report, including the chain of custody forms and applicable data validation reports;
- A list of equipment used;
- A copy of all field sampling logs;
- Site map;
- Data summary tables of the compounds of concern detected at each sampling location during the current sampling event;
- A Quality Assurance/Quality Control Section;
- Recommendations for any remedial action; and
- Recommendations for future modifications to the current monitoring program or to the site-specific QAPP, if appropriate.

Section 4 – Data Evaluation

4.1 Field Data Evaluation

The primary QA objective for all projects is to assure that all measurements are representative of actual site conditions and that all data resulting from field, sampling, and analytical activities be comparable and generated in a scientifically valid and legally defensible manner. It is important that the data collected are of known and documented quality. Any party generating data under this program has the responsibility to implement minimum procedures to assure that the precision, accuracy, completeness, and representativeness of its data are known and documented. The use of accepted, published sampling and

analysis methods, as well as the use of standardized units, aid in ensuring the comparability of the data. The Standard Operating Procedures (SOPs), as included in Appendix A of this project plan, have been developed to meet this objective.

4.2 Laboratory Data Evaluation

Data quality objectives (DQOs) are qualitative or quantitative statements developed by the data user to specify the quality of the data needed from a particular activity to support specific decisions. The DQOs are the starting point in designing a sampling program. The DQO development process matches sampling and analytical capabilities to the data targeted for specific uses and ensures that the quality of the data meets project requirements. The DQOs for this project are to identify potential PCB impacts from window caulking, floor caulking, wall caulking, and/or wall mortar leaching into building materials adjacent to the previously-identified PCB-impacted areas and to assess the limits of PCB contamination, if identified. Additional assessment and/or remediation work may be required based on the outcome of this project. One or more QAPP Addenda will be prepared for any such additional work (if required). Potential additional assessment of ground surfaces surrounding the windows will be addressed in a separate Site-Specific QAPP Addendum, if required.

Nover-Armstrong will accept the limits of precision and accuracy for analytes that have been established by the QA Office of the state-certified laboratory. The laboratories provide the necessary Analytical Method Report Certification Forms, case narratives, and QA/QC data reporting. In an effort to verify that the data collected were suitable for use in Site Characterization, the Project Manager and QA Coordinator will review the laboratory analytical reports generated as part of the assessment activities. This review will include the report narratives, surrogate recovery results, and the Analytical Method Report Certification Forms included in the data package.

Nover-Armstrong will accept the Method Detection Limits (MDL) and the Reportable Detection Limits (RDL) established by the state-certified laboratory. It is the Project Manager's responsibility to ensure that the laboratory's quality assurance program, including the MDL's, RDL's and limits of precision and accuracy for any quality control sample, support their DQOs and PQOs. Refer to Appendix B for a summary table of analytical test methods, laboratory RDLs/MDLs and regulatory action limits for all compounds tested on site.

The MassDEP *Compendium of Quality Control Requirements and Performance Standards for Selected Analytical Protocols* (CAM) (Policy #WSC-10-320) provides a series of required protocols for the acquisition, analysis, and reporting of analytical data in support of MCP decisions (a) to satisfy the broad quality assurance (QA) and quality control (QC) requirements of 310 CMR 40.0017 and 40.0191 regarding the scientific defensibility, precision and accuracy, and reporting of analytical data and (b) to meet the requirements and specifications for those parties who wish to obtain "Presumptive Certainty" for analytical data that may be used in a data usability and representativeness assessment, as required in 310 CMR 40.1056(2)(k) for Response Action Outcome (RAO) submittals, consistent with the guidance described in MassDEP Policy #WSC-07-350, *MCP Representativeness Evaluations and Data Usability Assessments*.

Nover-Armstrong's laboratory data evaluation standards and protocols will adhere to the MassDEP CAM and other MassDEP policies. The following paragraphs consist of MassDEP's definition of "Presumptive Certainty," the procedures required to obtain "Presumptive Certainty," and the role of "Presumptive Certainty" in a data usability and representativeness assessment.

The term "Presumptive Certainty" as used in Sections I through IX of the CAM describes a particular status for analytical or environmental monitoring data used in support of MCP Response Action submittals. Obtaining "Presumptive Certainty" status is just one of a number of options available to satisfy the data quality requirements for MCP submittals described in 310 CMR 40.0017, 40.0191 and 40.1056(2)(k). It should be clearly understood that exercising the "Presumptive Certainty" option is discretionary. However, *parties who elect not to utilize the "Presumptive Certainty" option have an obligation, pursuant to 310 CMR 40.0017 and 40.0191(2)(c), to demonstrate and document an overall level of QA/QC (laboratory and field), data usability, and data representativeness adequate for the intended use of the data.*

In order to achieve "Presumptive Certainty" for analytical data, parties must:

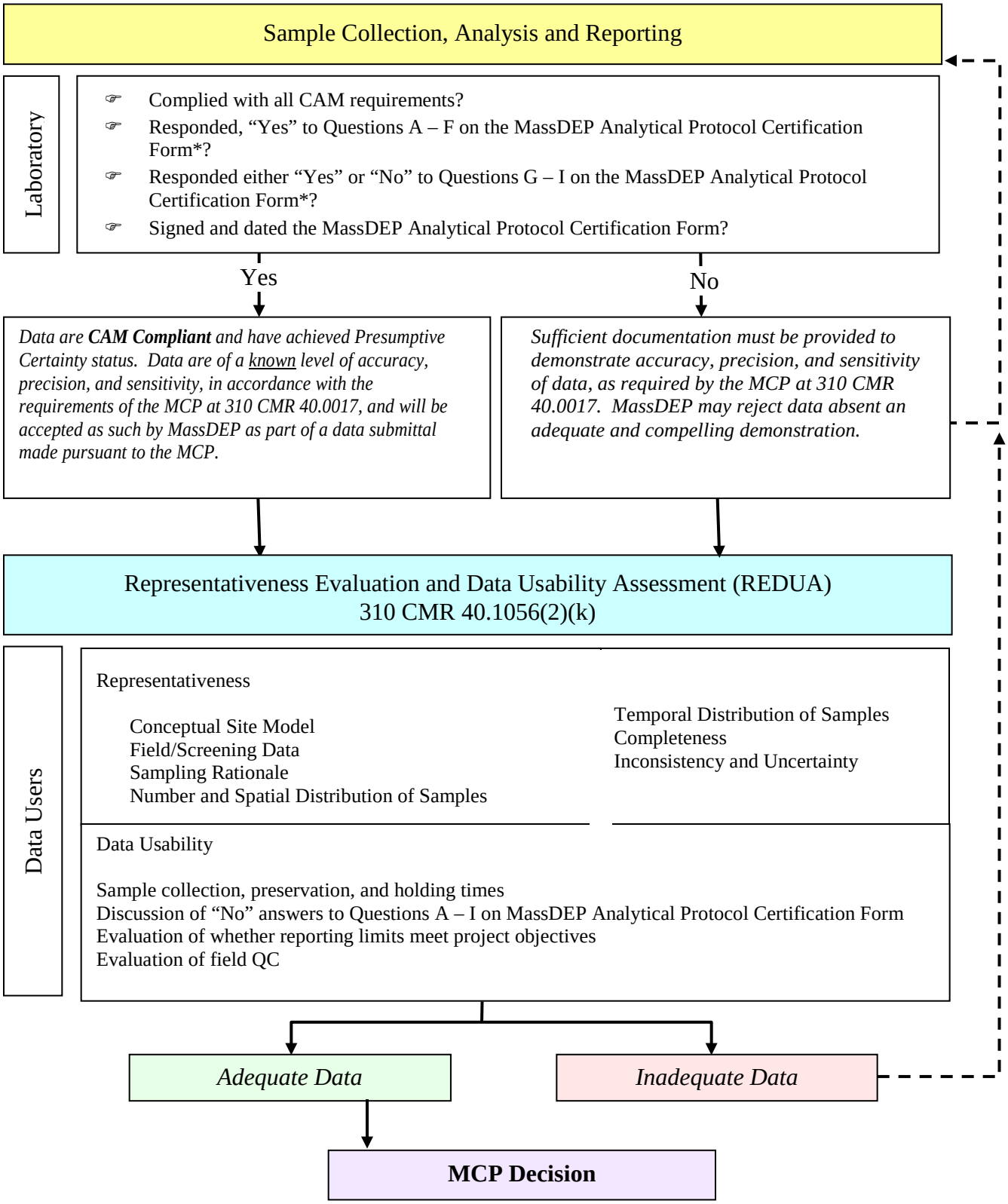
(a) Use the analytical method specified for the selected CAM protocol;
(b) Incorporate **all** required analytical QC elements specified for the selected CAM protocol;
(c) Implement, as necessary, required corrective actions and analytical response actions for **all** non-conforming analytical performance standards;
(d) Evaluate and narrate, as necessary, **all** identified CAM protocol non-compliances; and
(e) Comply with **all** the reporting requirements specified in WSC-CAM-VII A, including retention of reported and unreported analytical data and information for a period of ten (10) years.

In achieving "Presumptive Certainty" status, parties will be assured that analytical data sets:

- ✓ Satisfy the broad QA/QC requirements of 310 CMR 40.0017 and 40.0191 regarding the scientific defensibility, precision and accuracy, and reporting of analytical data; and
- ✓ May be used in a data usability and representativeness assessment, as required in 310 CMR 40.1056(2)(k) for RAO submittals, consistent with the guidance described in MassDEP Policy #WSC-07-350, *MCP Representativeness Evaluations and Data Usability Assessments*.

A logic diagram detailing the "Presumptive Certainty" approach is presented in Figure 4-1 (from MassDEP Policy #WSC-10-320).

Figure 4-1: MassDEP Presumptive Certainty and REDUA Concept



As indicated in Figure 4-1, use of the CAM and achievement of a "Presumptive Certainty" status will produce an analytical data set that will be accepted by agency reviewers for subsequent evaluation of data usability and representativeness.

It is stressed that "Presumptive Certainty" requirements are to be considered minimum requirements. Efforts that go beyond these minimum requirements (e.g., including additional points in a calibration curve) are considered compliant with the "Presumptive Certainty" concept and provisions, and need not be identified and discussed as an "exception."

The most recent version of the CAM is posted on the MassDEP's web site at http://www.mass.gov/dep/cleanup/laws/qaqcdocs.htm#I.

4.3 Data Usability and Project Evaluation

Data usability refers to the extent to which a data set can adequately meet specific site characterization needs and data quality objectives. For parties who elect to follow the specifications in the CAM, data will be considered usable for all subsequent data usability evaluations if all provisions and standards of the MCP Analytical Methods are met, including percent recovery limits for (any) method surrogate spikes and achievement of necessary (site-specific) Reporting Limits.

The overall project will be evaluated by the Nover-Armstrong Project Manager and QA Coordinator, at a minimum. The evaluation will include tabulation of data, comparison of data to state and/or federal standards, graphical representations of data and sampling locations, data usability and representativeness evaluation, interpretation of trends and anomalies, and formulation of conclusions. The evaluation will include a determination as to whether or not the project objectives were achieved and what additional actions may be required at the site.

Section 5 – References

United States Environmental Protection Agency (USEPA). 2001. *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5).

United States Environmental Protection Agency (USEPA). 2002. *EPA Guidance for Quality Assurance Project Plans* (EPA QA/G-5).

United States Environmental Protection Agency (USEPA). 2007. *Guidance for Preparing Standard Operating Procedures (SOPs)* (EPA QA/G-6).

United States Environmental Protection Agency (USEPA). 2000. *Guidance for Data Quality Assessment: Practical Methods for Data Analysis* (EPA QA/G-9).

United States Environmental Protection Agency (USEPA) Region 1. 2010. *Quality Assurance Project Plan Program Guidance*.

United States Environmental Protection Agency (USEPA) Region 1. 2009. *Planning and Documenting Brownfields Projects, Generic Quality Assurance Project Plans, and Site-specific QAPP Addenda*.

United States Environmental Protection Agency (USEPA). 2005. *Polychlorinated Biphenyl (PCB) Site Revitalization Guidance Under the Toxic Substances Control Act (TSCA).*

Code of Federal Regulations (CFR) 40 CFR 761

United States Environmental Protection Agency (USEPA). 2008. *Revitalizing Contaminated Sites: Addressing Liability Concerns (The Revitalization Handbook).*

Massachusetts Department of Environmental Protection (MassDEP). 2010. *Compendium of Quality Control Requirements and Performance Standards for Selected Analytical Protocols* (WSC-10-320).

Massachusetts Department of Environmental Protection (MassDEP). 2007. *MCP Representativeness Evaluations and Data Usability Assessments* (WSC-07-350).

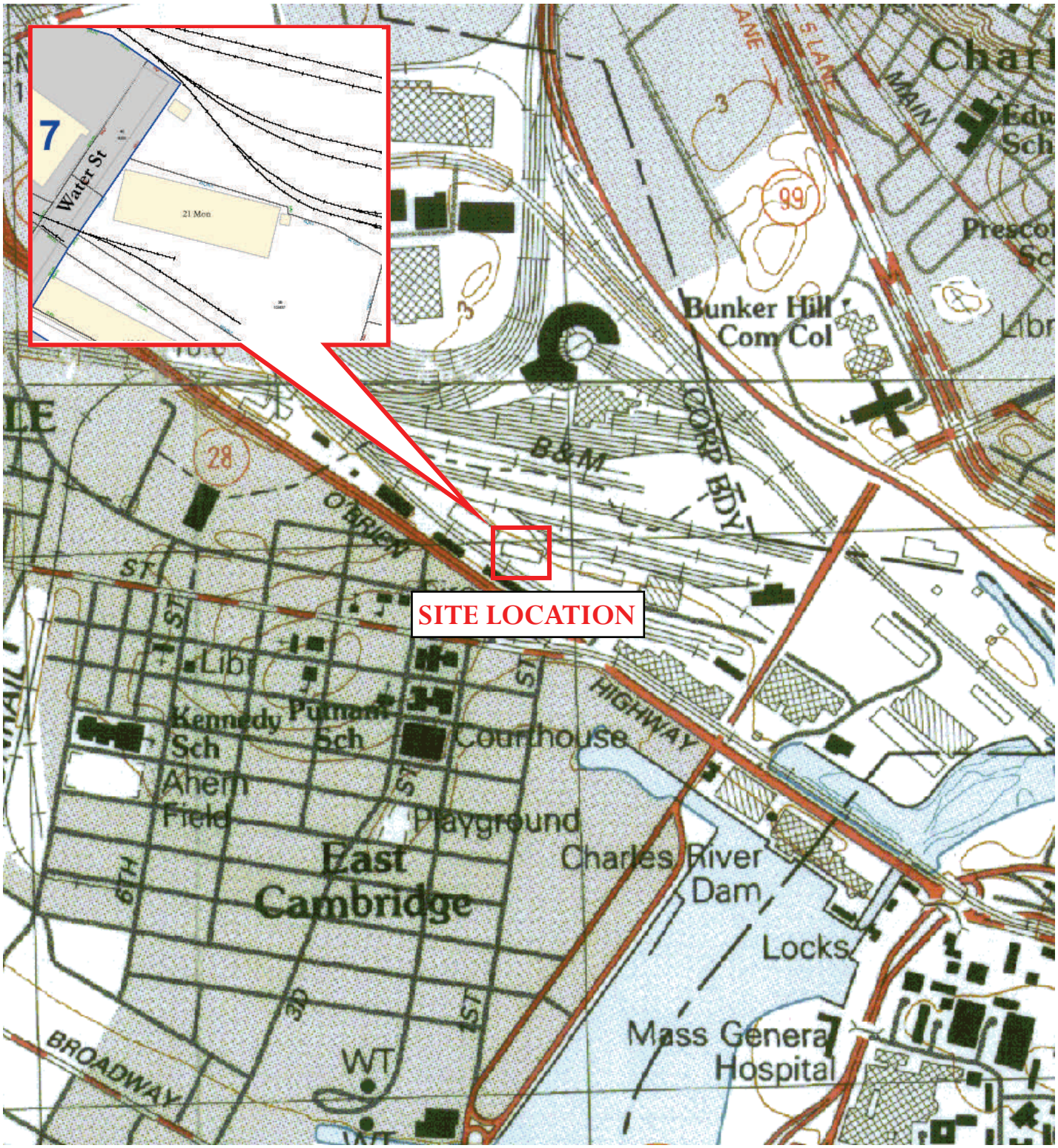


Figure 1-2: Site Location

MBTA Tire Maintenance Facility

21 Water Street, Cambridge, Massachusetts

NAA File P2814

Figure 2-1: CMU Sampling Groups

MBTA Tire Maintenance Facility
21 Water Street
Cambridge, Massachusetts
NAA File P2814

NOVER-ARMSTRONG ASSOCIATES, INC.

NOTES:
1. EACH SAMPLE WILL BE COLLECTED BY DRILLING 0-1" INTO THE EXTERIOR CONCRETE WALL SURFACE SURROUNDING THE WINDOW.

APPROXIMATE SAMPLING LOCATION

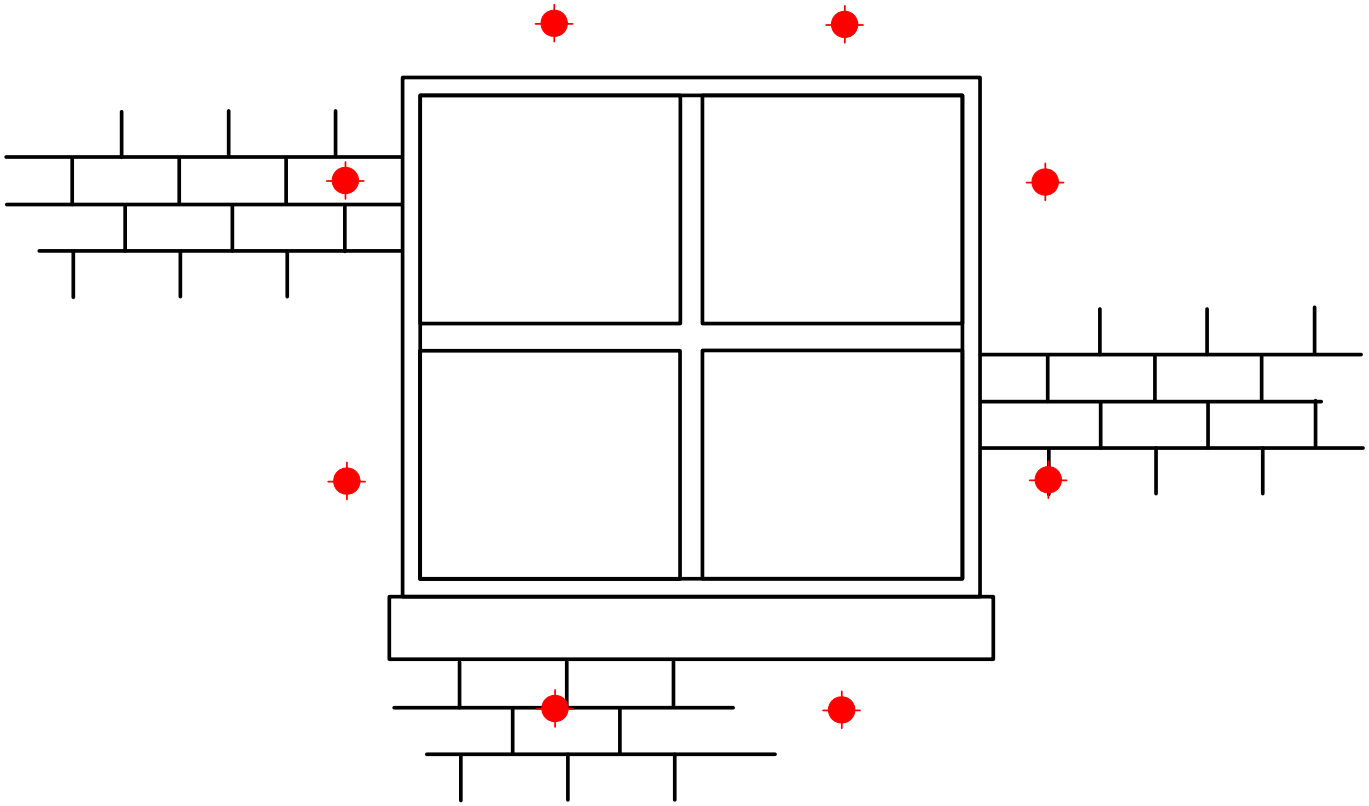
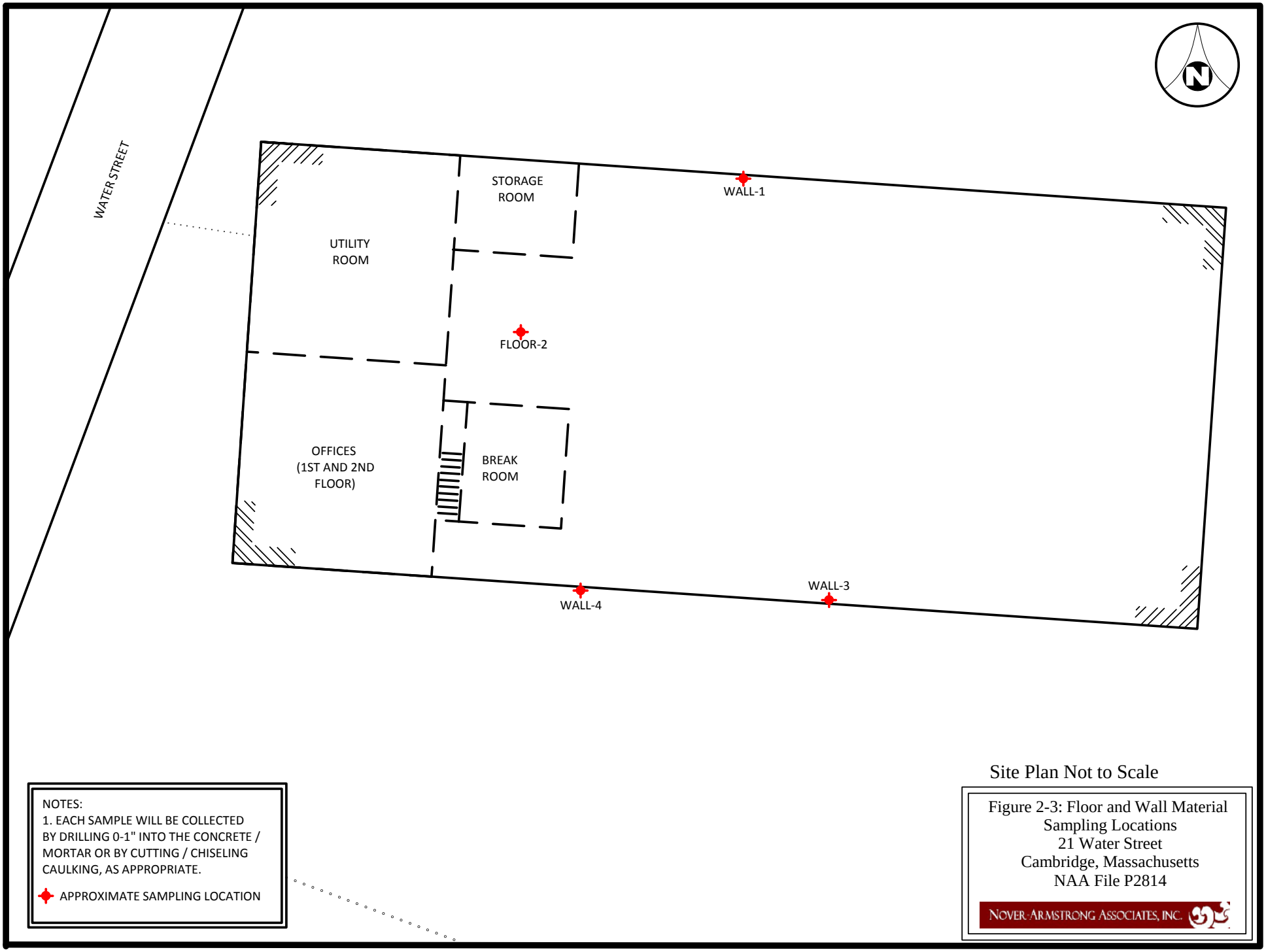


Figure 2-2: Individual Window Sampling Scheme
21 Water Street
Cambridge, Massachusetts
NAA File P2814

NOVER-ARMSTRONG ASSOCIATES, INC.

Site Plan Not to Scale


WATER STREET
STORAGE ROOM
WALL-1
UTILITY ROOM
FLOOR-2
OFFICES (1ST AND 2ND FLOOR)
BREAK ROOM
WALL-4
WALL-3
NOTES:
1. EACH SAMPLE WILL BE COLLECTED BY DRILLING 0-1" INTO THE CONCRETE / MORTAR OR BY CUTTING / CHISELING CAULKING, AS APPROPRIATE.
APPROXIMATE SAMPLING LOCATION
Site Plan Not to Scale
Figure 2-3: Floor and Wall Material Sampling Locations
21 Water Street
Cambridge, Massachusetts
NAA File P2814
NOVER-ARMSTRONG ASSOCIATES, INC.

APPENDIX A

SITE-SPECIFIC STANDARD OPERATING PROCEDURES (SOPs)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

STANDARD OPERATING PROCEDURE FOR SAMPLING POROUS SURFACES FOR POLYCHLORINATED BIPHENYLS (PCBs)

May 2011

SDMS DocID 484692

STANDARD OPERATING PROCEDURE FOR SAMPLING POROUS SURFACES FOR POLYCHLORINATED BIPHENYLS (PCBs)

The Office of Environmental Measurement and Evaluation
EPA New England – Region 1
11 Technology Dr.
North Chelmsford, MA 01863

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Reviewed by: Jerry Keefe – EIA Team Leader — Date: 05/23/11

Approved by: Dan Boudreau, EIA Chemistry Team Leader — Date: 5/23/11

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Revision Page

Date	Rev#	Summary of Changes	Sections
12/97	1	Initial Approval, draft	
3/20/08	2	Major update, only for PCBs, added TSCA sampling	All sections
7/17/08	3	Disposal of dust filter and decon of vac hose	11.0 and 14.0
5/04/11	4	Vacuum Trap Design and Clean-out	9.4

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11.0 Decontamination 11

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13.0 Quality Control and Quality Assurance 11

14.0 Waste Management and Pollution Prevention 12

15.0 References 12

Attachments:

Example of Custody Seal and Sample Label
Example of Chain of Custody Form

1.0 Scope and Application

1.1 This Standard Operating Procedure (SOP) is suitable for collection of a porous matrix sample for analysis of Polychlorinated Biphenyls (PCBs).

1.2 This SOP describes sampling techniques for both hard and soft porous surfaces.

1.2.1 Hard surfaces, and most soft surfaces, can be sampled using an impact hammer drill to generate a uniform, finely ground, powder to be extracted and analyzed for PCBs. This procedure is primarily geared at providing enough sample quantity for two analyses. Hard porous surfaces include concrete, brick, asphalt, cement, sandstone, limestone, unglazed ceramics, and other possible PCB suspected material. This procedure may also be used on other softer porous surfaces, such as wood.

1.2.2 Soft surfaces can be sampled using a chisel or sharp knife to generate a representative sample to be extracted and analyzed for PCBs. Soft porous surfaces include wood, wall plasterboard, low density plastics, rubber, caulking, and other PCB suspected material.

1.3 This SOP provides for collection of surface samples (0 – 0.5 inches) and delineation of PCB contamination throughout the core of the porous surface. The procedure can be used to sample the porous surface at distinctly different depth zones.

2.0 Method Summary

A one-inch or other sized diameter carbide drill bit is used in a rotary impact hammer drill to generate a fine powder, or other representative sample, suitable for extraction and analysis of PCBs from porous surfaces. This method also allows the use of chisels or knives for the collection of samples from soft porous surfaces for PCB analysis.

3.0 Definitions

3.1 Field/Bottle Blank: A sample container of the same lot as the containers used for the environmental samples. This evaluates PCB contamination introduced from the sample container(s) from a common lot.

3.2 Equipment/Rinse/Rinsate Blanks: A sample that is collected by pouring hexane over the sample collection equipment after decontamination and before sample collection. The sample is collected in the appropriate sample container identical to the sample containers. This represents background contamination resulting from the field equipment, sampling procedure, sample container, and shipment.

3.3 Field Replicates/Duplicates: Two or more samples collected at the same sampling location. Field replicates should be samples collected side by side. Field replicates represent the precision of the whole method, site heterogeneity, field sampling, and the laboratory analysis.

3.4 Field Split Samples: Two or more representative subsamples taken from one environmental sample in the field. Prior to splitting, the environmental sample is homogenized to correct for sample heterogeneity that would adversely impact data comparability. Field split samples are usually analyzed by different laboratories (interlaboratory comparison) or by the same laboratory (intralaboratory comparison). Field splits are used to assess sample handling procedures from field to laboratory and laboratory comparability.

3.5 Laboratory Quality Samples: Additional samples that will be collected for the laboratory's quality control program: matrix spike, matrix spike duplicate, laboratory duplicates, etc.

3.6 Proficiency Testing (PT)/Performance Evaluation (PE) Sample: A sample, the composition of which is unknown to the laboratory or analyst, provided to the analyst or laboratory to assess the capability to produce results within acceptable criteria. This is optional depending on the data quality objectives. If possible, it is recommended that the PE sample be of similar matrix as the porous surface(s) being sampled.

3.7 Porous Surface: Any surface that allows PCBs to penetrate or pass into itself including, but not limited to, paint or coating on metal; corroded metal; fibrous glass or glass wool; unglazed ceramics; ceramics with porous glaze; porous building stone such as sandstone, travertine, limestone, or coral rock; low density plastics such as Styrofoam and low density polyethylene; coated (varnished or painted) or uncoated wood; painted or unpainted concrete or cement; plaster; plasterboard; wallboard; rubber; caulking; fiberboard; chipboard; asphalt; or tar paper.

3.8 Shipping Container Temperature Blank: A water sample that is transported to the laboratory to measure the temperature of the samples in the cooler.

4.0 Health and Safety

4.1 Eye, respiratory, and hearing protection are required at all times during sample drilling. A properly fitted respirator is required for hard porous surface sampling. A respirator is recommended whenever there is a risk of inhalation of either particulate or volatilized PCBs during sampling.

4.2 All proper personal protection clothing and equipment must be worn.

4.3 When working with potentially hazardous materials or situations, follow EPA, OSHA, and specific health or safety procedures.

4.4 Care must be exercised when using an electrical drill and sharp cutting objects.

5.0 Interferences and Potential Problems

5.1 This sampling technique produces a finely ground uniform powder, which minimizes the physical matrix effects from variations in the sample consistency (i.e., particle size, uniformity, homogeneity, and surface condition). Matrix spike analysis of a sample is highly recommended to monitor for any matrix related interferences.

5.2 Nitrile gloves are recommended. Latex gloves must not be used due to possible phthalate contamination.

5.3 Interferences may result from using contaminated equipment, solvents, reagents, sample containers, or sampling in a disturbed area. The drill bit must be decontaminated between samples. (see Section 11.0.)

5.4 Cross contamination problems can be eliminated or minimized through the use of dedicated sampling equipment.

6.0 Personnel Qualifications

6.1 All field samplers working at hazardous materials/waste sites are required to take a 40 hour health and safety training course prior to engaging in any field activities. Subsequently, an 8 hour refresher health and safety course is required annually.

6.2 The field sampler should be trained by an experienced sampler before initiating this procedure.

6.3 All personnel shall be responsible for complying with all quality assurance/quality control requirements that pertain to their organizational/technical function.

7.0 Equipment and Supplies

7.1 This list varies with the matrix and if depth profiling is required

Rotary impact hammer variable speed drill
1-inch or other suitable (1/2, 3/4, etc.) diameter carbide tip drill bits
Steel chisel or sharp cutting knife, and hammer
Brush and cloths to clean area
Stainless steel scoopulas

Aluminum foil to collect the powder sample
1 quart Cubitainer with the top cut out to collect the powder sample
Aluminum weighing pans to collect the powder sample
Cleaned glass container (2 oz or 40 mL) with Teflon lined cap
Decontamination supplies: hexane, two small buckets, a scrub brush, detergent, deionized water, hexane squirt bottle, and paper towels
Dedicated vacuum cleaner with a disposable filter or a vacuum pump with a dust filter
Polyethylene tubing and Pasteur pipettes
Sample tags/labels, custody seals, and Chain-of-Custody form

8.0 Sampling Design

8.1 A sufficient number of samples must be collected to meet the data quality objectives of the project. If the source of the PCB contamination is regulated under the federal TSCA PCB Regulations at 40 CFR Part 761, the sampler should insure that the sampling design is sufficient to meet any investigation or verification sampling requirements. At a minimum, the following is recommended:

8.1.1 Suspected stained area (s) should be sampled.

8.1.2 At each separate location, collect at least 3 samples of each type of porous surface, regardless of the amount of each type of porous surface present.

8.1.3 In areas where PCB equipment was used or where PCBs were stored, samples should be collected at a frequency of 1 sample/100 square feet (ft^2).

9.0 Sample Collection

9.1 Hard Porous Surfaces

9.1.1 Lock a 1-inch or another size diameter carbide drill bit into the impact hammer drill and plug the drill into an appropriate power source. For easy identification, sample locations may be pre-marked using a marker or paint. (Note: the actual drilling point must not be marked.) Remove any debris with a clean brush or cloth prior to drilling. All sampling decisions of this nature should be noted in the sampling logbook.

9.1.2 Use a Cubitainer with the top cut off or aluminum foil to contain the powdered sample. Begin drilling in the designated location. Apply steady even pressure and let the drill do the work. Applying too much pressure will generate excessive heat and dull the drill bit prematurely. The drill will provide a finely ground powder that can be easily collected.

9.1.3 Samples should be collected at ½-inch depth intervals. Thus, the initial surface sample should be collected from 0 – 0.5 inches. A ½-inch deep hole generates about 10 grams (20 mL) of powder. Multiple holes located closely adjacent to each other, may be needed to generate sufficient sample volumes for a PCB determination. It is strongly recommended that the analytical laboratory be consulted on the minimum sample size needed for PCB extraction and analysis.

9.1.4 Wall and Ceiling Sampling: A team of two samplers will be required for wall and ceiling sampling. The second person will hold a clean catch surface (e.g. an aluminum pan) below the drill to collect the falling powder. Alternatively, use the chuck-end of the drill bit and punch a hole through the center of the collection pan. The drill bit is then mounted through the pan and into the drill. For ceilings, the drill may be held at an angle to collect the powder. Thus the driller can be drilling at an angle while the assistant steadies the pan to catch the falling powder. As a precaution, it may be advantageous to tape a piece of plastic around the drill, just below the chuck, to avoid dust contaminating the body of the drill and entering the drill's cooling vents. Caution must be taken to prevent obstruction of the drill's cooling vents.

9.2 Soft Porous Surfaces

9.2.1 The procedure for the hard porous surface may be used for certain soft porous surfaces, such as wood.

9.2.2 Samples should be collected at no more than ½-inch depth intervals using a metal chisel or sharp cutting knife. Thus, the initial surface sample should be collected from 0 – 0.5 inches. It is important to collect at least 10 grams for analysis.

9.2.3 For soft porous surfaces, such as caulking and rubber, a representative sample can be collected using a metal chisel or sharp cutting knife.

9.3 Multiple Depth Sampling

9.3.1 Multiple Depth Sampling may not be applicable to certain porous surfaces, such as caulking.

9.3.2 Collect the surface sample as outlined in Section 9.1 or 9.2.

9.3.3 Use the vacuum pump or cleaner to clean out the hole.

9.3.4 To collect multiple depths there are two options.

9.3.4.1 Option one: drill sequentially ½-inch increments with the 1 inch drill.

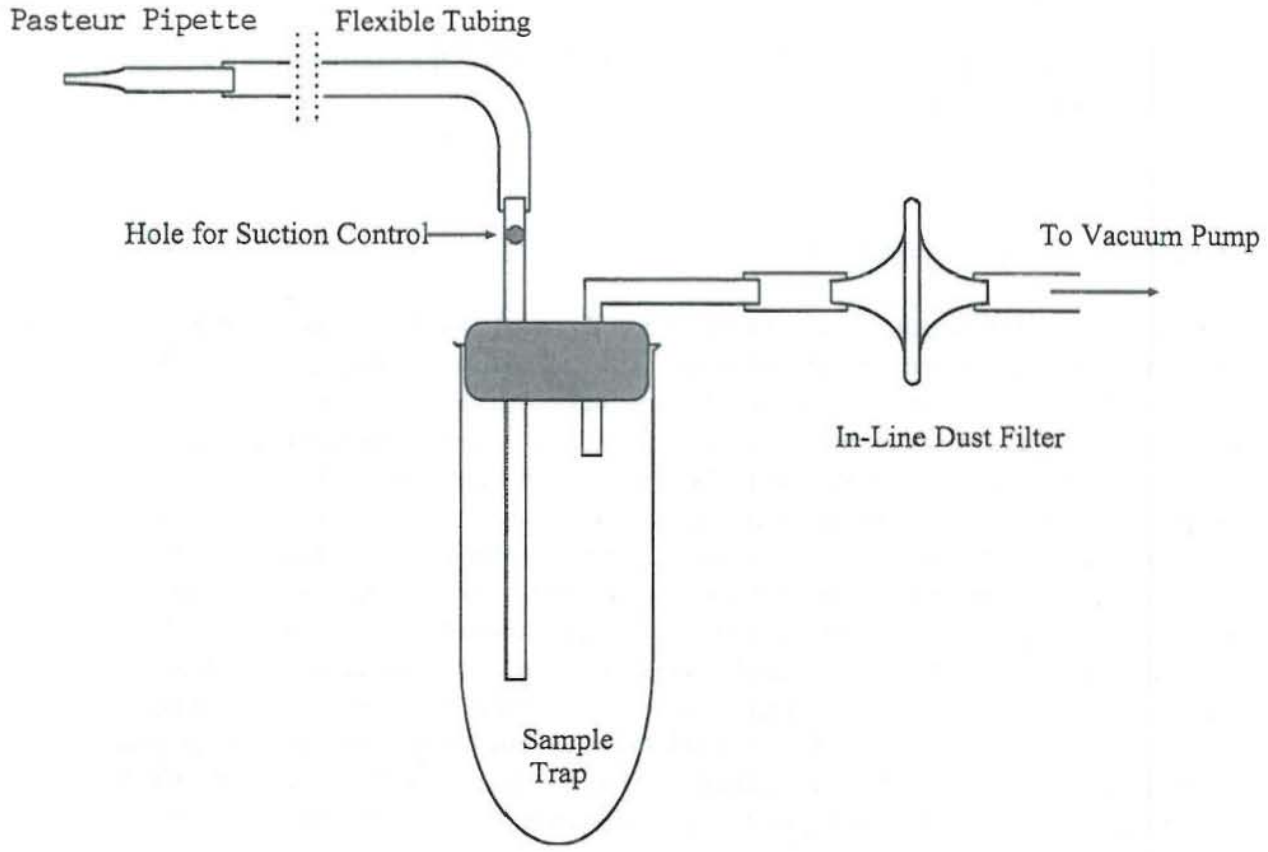
9.3.4.2 Option two: drill with the 1 inch bit and either make the hole larger or use a smaller bit to take the next ½- inch sample.

9.3.5 A stainless steel scoopula will make it easier to collect the sample from the bottom of the hole.

9.4 Vacuum Trap Design and Clean-out

The trap presented in Figure 1 is a convenient and thorough way for collecting and removing concrete powder from drilled holes. The trap system is designed to allow for control of the suction from the vacuum pump and easy trap clean-out between samples. Note, by placing a hole in the inlet tube (see Figure 1), a finger on the hand holding the trap can be used to control the suction at the sampling tip. Thus, when this hole is left completely open, there will be no suction, and the sampler can have complete control over where and what to sample. To change-out between samples the following steps should be taken: 1) the Pasteur pipette and piece of polyethylene tubing at the sample inlet should be replaced with new materials, 2) the portion of the rubber stopper and glass tubing that was in the trap should be wiped down with a clean damp paper towel (wetted with deionized water) and then dried with a fresh paper towel, 3) a clean pipe cleaner should be drawn through the glass inlet tube to remove any concrete dust present, and 4) the glass tube or flask used to collect the sample should swapped out with a clean decontaminated sample trap. Having several clean tubes or flasks on hand will facilitate change-out between samples.

Figure 1



Note: the holes should be vacuumed thoroughly to minimize any cross-contamination between sample depths and the bits should be decontaminated between samples. (See Section 11.0)

10.0 Sample Handling, Preservation, and Storage

10.1 Samples must be collected in glass containers for PCB analyses. In general, a 2-ounce sample container with a Teflon-lined cap (wide-mouth jars are preferred) will hold sufficient mass for most analyses. A 2-ounce jar can hold roughly 90 grams of sample.

10.2 Samples are to be shipped refrigerated and maintained at $\leq$ 6°C until the time of extraction and analysis.

10.3 The suggested holding time for PCB samples is 14 days to extraction.

11.0 Decontamination

11.1 Assemble two decontamination buckets. The first bucket contains a detergent and potable water solution, and the second bucket is for rinsate. Place all used drill bits, hose for the vacuum cleaner, and utensils in the detergent and water bucket. Scrub each piece thoroughly using the scrub brush. Note, the powder does cling to the metal surfaces, so care should be taken during this step, especially with the twists and curves of the drill bits. Next, rinse each piece with water and hexane. Place the rinsed pieces on clean paper towels and individually dry and inspect each piece. Note: all pieces should be dry prior to reuse.

11.2 Lightly contaminated drill bits and utensils may be wiped with a hexane soaked cloth and hexane rinsed for decontamination.

12.0 Data and Record Management

12.1 All data and information collection should follow a Field Data Management SOP or Quality Assurance Project Plan (QAPP).

12.2 Follow the chain of custody procedures to release the samples to the laboratory. A copy is kept with the sampling records.

12.3 The field data is stored for at least 3 years.

13.0 Quality Control and Quality Assurance

13.1 Representative samples are required. The sampler will evaluate the site specific conditions to assure the sample will be representative.

13.2 All sampling equipment must be decontaminated prior to use and between each discrete sample.

13.3 All field Quality Control (QC) sample requirements in a Sample and Analysis Plan (SAP) or QAPP must be followed. The SAP or QAPP may involve field blanks, equipment blanks, field duplicates and/or the collection of extra samples for the laboratory's quality control program.

13.4 Field duplicates should be collected at a minimum frequency of 1 per 20 samples or 1 per non-related porous matrix, whichever is greater.

14.0 Waste Management and Pollution Prevention

14.1 During field sampling events there may be PCB and/or hazardous waste produced from the sample collection. The waste must be handled and disposed of in accordance with federal, state, and local regulations. The dust filter, and tubing if a vacuum pump is used, is disposed after each site investigation. This waste will be treated as PCB waste if the samples are positive for PCBs. It may be possible to manage or dispose of the waste produced at the site where the work was performed. If the site does not meet regulatory requirements for these types of activities, the waste must be transported to a facility permitted to manage and/or dispose of the waste.

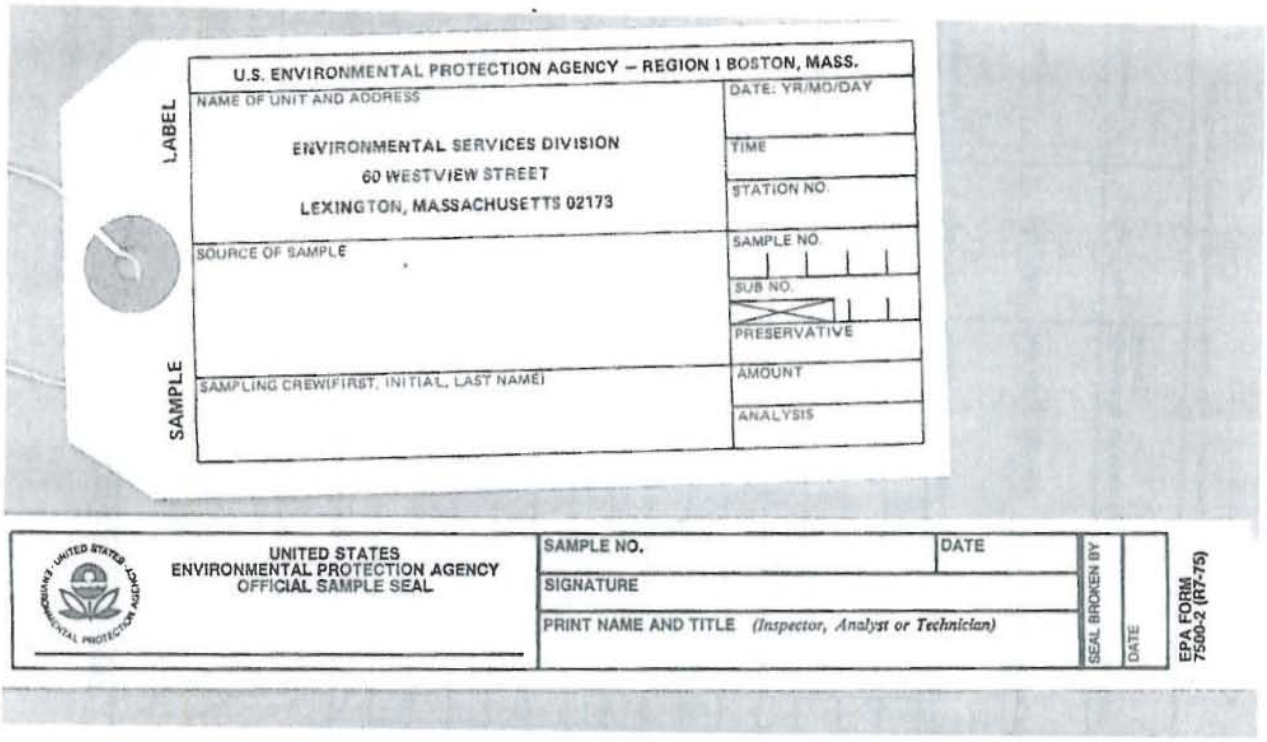
15.0 References

1. Guidance for the Preparation of Standard Operating Procedures for Quality-Related Operations, QA/G-6, EPA/600/R-96/027, November 1995.

2. 40 CFR Part 761 – Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution In Commerce, and Use Prohibitions

3. Sample Container and Holding Time: RCRA SW 846, Chapter 4, Table 4.1, Revision 4, February, 2007.

Example of Sample Label and Custody Seal



U.S. ENVIRONMENTAL PROTECTION AGENCY – REGION I BOSTON, MASS.

LABEL

NAME OF UNIT AND ADDRESS

ENVIRONMENTAL SERVICES DIVISION
60 WESTVIEW STREET
LEXINGTON, MASSACHUSETTS 02173

DATE: YR/MO/DAY

TIME

STATION NO.

SAMPLE

SOURCE OF SAMPLE

SAMPLE NO.

SUB NO.

PRESERVATIVE

SAMPLING CREW(FIRST, INITIAL, LAST NAME)

AMOUNT

ANALYSIS

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SAMPLE SEAL

SAMPLE NO.

DATE

SIGNATURE

PRINT NAME AND TITLE *(Inspector, Analyst or Technician)*

SEAL BROKEN BY

DATE

EPA FORM
7500-2 (R7-75)

Example of Chain of Custody Form

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME	NO. OF CON-TAINERS							REMARKS
SAMPLERS: *(Signature)*									
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION				

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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Equipment Decontamination

Standard Operating Procedure SOP.NAA_C.05.1

July 2011

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A. PURPOSE AND APPLICABILITY

The purpose of this Standard Operating Procedure (SOP) is to establish a uniform procedure for the decontamination of sampling equipment when the use of single use disposable equipment is not possible. The procedures outlined in this SOP are applicable to all Nover-Armstrong Associates, Inc. (Nover-Armstrong) field personnel who decontaminate reusable equipment prior to use in the field.

B. SUMMARY OF METHOD

Equipment is cleaned and decontaminated before its use in every different location. Appropriate methods, determined by the function of the equipment and what compounds the equipment is used to measure, are observed.

C. DEFINITIONS

VOC	Volatile Organic Compound
SVOC	Semi-Volatile Organic Compound
PCB	Polychlorinated Biphenyl
VOA	Volatile Organic Analysis
MCP	Massachusetts Contingency Plan (310 CMR 40.0000)
OSHA	Occupational Health and Safety Administration
HAZWOPER	Hazardous Waste Operations and Emergency Response
TPH	Total Petroleum Hydrocarbon
MeOH	Methanol

D. HEALTH AND SAFETY WARNINGS

Field sampling personnel should use caution when handling soil samples with potentially elevated concentrations of hazardous chemical compounds. The sampler should wear protective gloves and safety glasses to avoid direct contact with the soil. The sampler should also wear clothing and protective gear that is appropriate for the type of site, field conditions, and weather conditions in which they are collecting the soil samples. Gloves and other articles of clothing that come in contact with potentially contaminated soil should be cleaned or disposed of after each sampling event. Food and drink should not be brought onto sites at which elevated concentrations of hazardous materials are potentially present. Laboratory containers containing corrosive, caustic, and/or toxic chemical preservatives must be handled with care.

E. CAUTIONS

It is important to note the source of rinse water, for it is often from nearby public sources. The source should be noted and a sample collected.

F. INTERFERENCES

Avoid using distilled water stored in plastic bottles for the plastic contains too many contaminants. Bring deionized water in either nalgene bottles or teflon bottles if possible.

G. PERSONNEL QUALIFICATIONS

Field sampling personnel using this SOP should have completed OSHA's 40-hour HAZWOPER training and annual 8-hour refresher training.

H. EQUIPMENT AND SUPPLIES

The following equipment and supplies are required for this SOP:

- Plastic gloves
- Safety glasses
- Garbage bag for disposal of used field supplies
- Non-phosphate detergent-solution (e.g. Alconox)
- Brush
- Tap water
- Deionized water (either ASTM type I or II)
- Decontamination of metals analysis equipment additionally requires:
    - 1:1 nitric acid
- Decontamination of SVOC collection equipment additionally requires:
    - Technical grade acetone
    - Pesticide grade hexane
- Decontamination of VOC collection equipment OR of oil or grease analysis equipment additionally requires:
    - Reagent grade methanol (MeOH)

I. PROCEDURE[1]

1. Equipment to be utilized in the collection of samples for metals analysis should be cleaned by the following steps:
    a. Wash equipment with a non-phosphate detergent-solution and a brush.
    b. Rinse thoroughly with tap water.
    c. Rinse with 1:1 nitric acid.
    d. Rinse the equipment thoroughly with deionized water.
    e. For water samples, rinse the equipment two to three times with the media being sampled before collecting a sample.
    f. Repeat this procedure at each location.

2. Equipment to be used for collection of samples for oil identification, oil and grease analyses, and TPH should be cleaned by the following steps:
    a. Wash equipment with a non-phosphate detergent-solution and a brush.
    b. Rinse with tap water.
    c. Rinse with reagent grade MeOH
    d. Rinse thoroughly with deionized water.
    e. For water samples, rinse the equipment two to three times with the media being sampled prior to collecting a sample.

[1] Nover-Armstrong's Standard Operating Procedure (SOP) for decontamination of sampling equipment follows the procedures described in MassDEP Policy WSC-91-310 *Standard References for Monitoring Wells.*

f. Repeat at each location.

3. Equipment to be used for collection of SVOCs (including base-neutral extractables, PCBs, herbicides, and pesticides) should be cleaned by the following steps:
   a. Wash equipment with a non-phosphate detergent-solution and a brush
   b. Rinse with tap water.
   c. Rinse with technical grade acetone.
   d. Rinse with pesticide grade hexane.
   e. Rinse thoroughly with deionized water.
   f. For water samples, rinse the equipment two to three times with the media being sampled prior to collecting a sample.
   g. Repeat at each location.

4. Equipment used for collection of samples for VOA should be cleaned by the following steps:
   a. Wash equipment with a non-phosphate detergent solution and a brush.
   b. Rinse with tap water.
   c. Rinse with reagent grade MeOH.
   d. Rinse thoroughly with deionized water.
   e. For water samples, rinse the equipment two to three times with the media being sampled prior to collecting a sample.
   f. Repeat at each location.

5. Steam Cleaning is another acceptable technique for field decontamination.

J. DATA AND RECORDS MANAGEMENT

Hard copies of recorded field sampling notes will be kept in individual project folders at the Nover-Armstrong office location in Carver, MA. Additionally, the field sampling notes will be scanned and stored electronically on the company's computer system. Laboratory analytical results will be received as electronic .pdf files and stored electronically on Nover-Armstrong's computer system. Archived files of analytical results are also maintained by the analytical laboratories.

K. QUALITY CONTROL AND QUALITY ASSURANCE

Instrumentation shall be checked intermittently by the Project Manager to ensure that the proper procedures for equipment decontamination are being followed at all project sites.

L. REFERENCES

1. United States Environmental Protection Agency (USEPA). 2007. *Guidance for Preparing Standard Operating Procedures (SOPs)* (EPA QA/G-6).

2. United States Environmental Protection Agency (USEPA) Region 1. 2010. *Quality Assurance Project Plan Program Guidance*.

3. MassDEP Policy WSC-91-310 *Standard References for Monitoring Wells*

4. SOP.NAA_C.01.1 Field Documentation

Chain of Custody Sample Handling & Shipping

Standard Operating Procedure SOP.NAA_C.07.1

July 2011

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A. PURPOSE AND APPLICABILITY

The purpose of this Standard Operating Procedure (SOP) is to establish a uniform procedure for documenting the chain of custody associated with any field sample to ensure that the sample is accounted for at all times. The procedures outlined in this SOP are applicable to all Nover-Armstrong Associates, Inc. (Nover-Armstrong) field personnel who collect or handle field samples.

B. SUMMARY OF METHOD

Chain of custody records are created and maintained in order to document the identity of a sample and its handling from its creation as a sample until analysis and data reduction are completed.

C. DEFINITIONS

COC	Chain of Custody
MCP	Massachusetts Contingency Plan (310 CMR 40.0000)
OSHA	Occupational Health and Safety Administration
HAZWOPER	Hazardous Waste Operations and Emergency Response
VOC	Volatile Organic Compound

D. HEALTH AND SAFETY WARNINGS

Field sampling personnel should use caution when handling soil samples with potentially elevated concentrations of hazardous chemical compounds. The sampler should wear protective gloves and safety glasses to avoid direct contact with the soil. The sampler should also wear clothing and protective gear that is appropriate for the type of site, field conditions, and weather conditions in which they are collecting the soil samples. Gloves and other articles of clothing that come in contact with potentially contaminated soil should be cleaned or disposed of after each sampling event. Food and drink should not be brought onto sites at which elevated concentrations of hazardous materials are potentially present. Laboratory containers containing corrosive, caustic, and/or toxic chemical preservatives must be handled with care.

E. CAUTIONS

Care must be taken to uniquely identify all samples, samples are protected from loss or damage, any processing of samples is documented, and client confidentiality is maintained. A sample is considered to be under a chain of custody if it is in your custody, it is in your view after being in your possession, it is in your possession and locked up to prevent tampering, and it is in a designated, secured area.

F. INTERFERENCES

Avoid leaving samples unattended, unlocked, or in locations where they could be tampered with or vandalized.

G. PERSONNEL QUALIFICATIONS

Field sampling personnel using this SOP should have completed OSHA’s 40-hour HAZWOPER training and annual 8-hour refresher training.

H. EQUIPMENT AND SUPPLIES

The following equipment and supplies are required for this SOP:

- Plastic gloves
- Safety glasses
- Chain of Custody form
- Chain of Custody records
- Field data sheets
- Sample labels
- Pen or marker for labels
- Field book for notes

I. PROCEDURE[1]

1. Pre-prepare labels for each sample that includes identification, date and time of collection, sample parameters to be analyzed, any preservatives added, and the name of the sample collector.

2. Record the procedures and amounts of reagents or supplies necessary for each sample including sample preparation and preservation.

3. Record date and time of sampling, sampling locations, sample bottle identification, and specific sample acquisition measures on the chain of custody forms.

4. The COC description section requires:
    a. A unique identification of each sample
    b. The name(s), address(es), and telephone number(s) of the sampler(s) and the person shipping the samples and all subsequent transfers of custody
    c. The type and method of analysis requested (sometimes this can be put on the field data sheet that accompanies the COC form)
    d. The date and time that the samples were taken and delivered for shipping
    e. The names of those responsible for receiving the samples at the laboratory

5. Complete standard field data record forms to establish sample custody in the field before sample shipment.

6. At least four copies of the COC record are needed:
    a. The original COC record and one copy are sent to the laboratory with the samples
    b. One copy is retained by the sampling crew chief
    c. One copy is placed in the project file
7. The signed copy of the original COC record is retained by the laboratory, but copies of the original record, signed by the receiving laboratory are returned to the sampling crew chief and to the project file.

---

[1] Nover-Armstrong's Standard Operating Procedure (SOP) for chain of custody documentation follows the procedures described in MassDEP Policy WSC-91-310 *Standard References for Monitoring Wells.*

J. DATA AND RECORDS MANAGEMENT

Hard copies of COCs will be kept in individual project folders at the Nover-Armstrong office location in Carver, MA. Additionally, the COCs will be scanned and stored electronically on the company's computer system. Laboratory analytical results will be received as electronic .pdf files and stored electronically on Nover-Armstrong's computer system. Archived files of analytical results are also maintained by the analytical laboratories.

K. QUALITY CONTROL AND QUALITY ASSURANCE

Chains of Custody will be reviewed by the Project Manager to ensure proper documentation procedures. Nover-Armstrong field personnel will be trained to properly complete COCs prior to using them in the field. Special instructions on COCs will be verbally conveyed to laboratory personnel to ensure that the proper instructions are being followed.

L. REFERENCES

1. United States Environmental Protection Agency (USEPA). 2007. *Guidance for Preparing Standard Operating Procedures (SOPs)* (EPA QA/G-6).

2. United States Environmental Protection Agency (USEPA) Region 1. 2010. *Quality Assurance Project Plan Program Guidance*.

3. MassDEP Policy WSC-91-310 *Standard References for Monitoring Wells*

4. SOP.NAA_C.01.1 Field Documentation

Field Documentation

Standard Operating Procedure SOP.NAA_C.01.1

July 2011

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L. REFERENCES 6

A. PURPOSE AND APPLICABILITY

The purpose of this Standard Operating Procedure (SOP) is to establish a uniform procedure for documenting samples collected for analysis. The procedures outlined in this SOP are applicable to all Nover-Armstrong Associates, Inc. (Nover-Armstrong) field personnel who collect samples for laboratory analysis at MCP and non-MCP project sites.

B. SUMMARY OF METHOD

Collected samples are documented to uniquely identify each sample and ensure adequate chain-of-custody procedures.

C. DEFINITIONS

VOC	Volatile Organic Compound
MCP	Massachusetts Contingency Plan (310 CMR 40.0000)
OSHA	Occupational Health and Safety Administration
HAZWOPER	Hazardous Waste Operations and Emergency Response

D. HEALTH AND SAFETY WARNINGS

Field sampling personnel should use caution when handling soil samples with potentially elevated concentrations of hazardous chemical compounds. The sampler should wear protective gloves and safety glasses to avoid direct contact with the soil. The sampler should also wear clothing and protective gear that is appropriate for the type of site, field conditions, and weather conditions in which they are collecting the soil samples. Gloves and other articles of clothing that come in contact with potentially contaminated soil should be cleaned or disposed of after each sampling event. Food and drink should not be brought onto sites at which elevated concentrations of hazardous materials are potentially present. Laboratory containers containing corrosive, caustic, and/or toxic chemical preservatives must be handled with care.

E. CAUTIONS

Take care to note that any samples collected may be used in future litigations. Also take note that if taking samples from privately owned property, samplers should provide the property owner with a receipt for the samples collected.

F. INTERFERENCES

Avoid using multiple transportation carriers in sending samples to the laboratory to avoid confusion.

G. PERSONNEL QUALIFICATIONS

Field sampling personnel using this SOP should have completed OSHA's 40-hour HAZWOPER training and annual 8-hour refresher training.

H. EQUIPMENT AND SUPPLIES

The following equipment and supplies are required for this SOP:

- Plastic gloves
- Safety glasses
- Chain of Custody form
- Sample labels
- Pen or marker for labels
- Field book for notes
- Garbage bag for disposal of used field supplies

I. PROCEDURE

1. Review project plans to determine what types of documentation must be completed for a sampling project and to ensure that the appropriate documentation will be on-hand in the field.

2. Field personnel shall use field logbooks and/or pre-printed work sheets to accurately document all field activities: on-site conditions; field measurements; sample collection information; field instrument and calibration information; and other pertinent site-related information during monitoring activities.

3. The field notes shall include a description of field conditions that includes, as a minimum:

    - Site location
    - Date, start, and finish times of the work and weather conditions;
    - Name and initials of person making entry;
    - Names of other personnel present, if any;
    - Names of visitors, if any;
    - Purpose and summary of proposed work effort;
    - Details of any deviation from the field operations plan or standard operating procedures, including who authorized the deviation;
    - Field observations;
    - Sampling equipment used (including make model and serial number) and equipment calibration documentation;
    - Field screening methods, if used, and a description of screening locations;
    - Field screening results, and identify samples with both field and fixed lab analyses;
    - Fixed laboratory sample identification number, sample type (composite, grab), time of sampling, sample analysis, and sample locations shown on a near-scale map relative to a fixed landmark;
    - Sample handling, packaging, labeling, and shipping information (including destination);
    - Location, description and unique identifier for all photographs taken in association with the field activity; and
    - Any other pertinent information

4. Information recorded in other site documents, *e.g.*, sampling logs, will not be repeated in logbooks except in summary form.

5. Any corrections to the logbook or other written documentation shall be initialed and dated. All corrections shall be shown as a single line through the original. The unused bottom portion of each page shall be lined-out, initialed, and dated.

J. DATA AND RECORDS MANAGEMENT

Hard copies of recorded field sampling notes will be kept in individual project folders at the Nover-Armstrong office location in Carver, MA. Additionally, the field sampling notes will be scanned and stored electronically on the company's computer system. Laboratory analytical results will be received as electronic .pdf files and stored electronically on Nover-Armstrong's computer system. Archived files of analytical results are also maintained by the analytical laboratories.

K. QUALITY CONTROL AND QUALITY ASSURANCE

Copies of field documentation will be reviewed by Project Managers upon completion of field activities to ensure the quality and correctness of the documentation. Any inconsistencies or questionable field notes will be reviewed together with field personnel to achieve clarity and reduce confusion. Nover-Armstrong field sampling personnel will be trained in the field documentation SOP prior to conducting field activities.

L. REFERENCES

1. United States Environmental Protection Agency (USEPA). 2007. *Guidance for Preparing Standard Operating Procedures (SOPs)* (EPA QA/G-6).

2. United States Environmental Protection Agency (USEPA) Region 1. 2010. *Quality Assurance Project Plan Program Guidance*.

3. US EPA *Sampler's Guide: Contract Laboratory Guidance for Field* Sampler s (July 2007). EPA 540-R-07-06.

PCBs

By Capillary Column Gas Chromatography

Reference Methods No.: **Method 8082**

Reference: SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, 1997.

1. Scope and Application

Method 8082 is used to determine the concentrations of Polychlorinated Biphenyls (PCBs) as Aroclors in extracts from solid and liquid matrices. This SOP details the analysis for PCBs using fused-silica, open-tubular, capillary columns with electron capture detectors (ECD).

Matrices: Extracts from solid and liquid matrices.

Definitions: See Alpha Laboratories Quality Manual Appendix A

Regulatory Parameter List: The standard compounds listed below are determined by this method.

Parameter	CAS
Aroclor 1016	12674-11-2
Aroclor 1221	11104-28-2
Aroclor 1232	11141-16-5
Aroclor 1242	53469-21-9
Aroclor 1248	12672-29-6
Aroclor 1254	11097-69-1
Aroclor 1260	11096-82-5
Aroclor 1262	37324-23-5
Aroclor 1268	11100-14-4

The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one of the following laboratory personnel before performing the modification: Area Supervisor, Laboratory Director, or Quality Assurance Officer.

This method is restricted to use by or under the supervision of analysts experienced in the operation of the gas chromatograph (GC) and in the interpretation of gas chromatograms. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability (see section 13.2), analyzing a proficiency test sample and completing the record of training.

After initial demonstration, ongoing demonstration is based on acceptable laboratory performance of at least a quarterly laboratory control sample or acceptable performance from an annual proficiency test sample. A major modification to this procedure requires demonstration of performance. The identification of major method modification requiring performance demonstration is directed by the QA Officer and/or Laboratory Director on a case-by-case basis.

2. Summary of Method

A measured volume or weight of sample (approximately 1L for liquids, 15g to 30g for solids) is extracted using the appropriate matrix-specific sample extraction technique.

Liquid samples are extracted at neutral pH with methylene chloride using Method 3510C (separatory funnel), or other appropriate technique.

Solid samples are extracted with methylene chloride: acetone (1:1) using Method 3540C (Soxhlet), or other appropriate technique. Solid samples may also be extracted with hexane:acetone (1:1) using Method 3546 (microwave).

Wipe samples are extracted with methylene chloride: acetone (1:1) using Method 3540C (Soxhlet) or other appropriate technique.

Oil samples are diluted with hexane following the procedure outlined in the extraction SOP.

Sulfuric acid cleanup (Method 3665) and Copper cleanup (Method 3660B) are utilized for PCB extracts.

After cleanup, the extract is analyzed by injecting 1µL into a gas chromatograph equipped with narrow- or wide-bore fused silica capillary columns and electron capture (GC/ECD) detectors.

2.1 Method Modifications from Reference

Internal standard calibration is used for all analytes. The internal standard used is 1-bromo-2-nitrobenzene.

3. Reporting Limits

Reporting limits vary depending on project specific data quality objectives.

4. Interferences

4.1 Instrumental

4.1.1 Only high purity gases are used in the GC system to eliminate this source of possible contamination. Both the helium (carrier gas – 99.999%) and argon-methane (detector make-up gas) are certified by the gas supplier.

4.1.2 Preventive instrument maintenance is performed routinely, and whenever highly contaminated extracts are analyzed that could result in chromatographic interferences or result in degradation of system performance. Section 9.5 details the maintenance steps.

4.1.3 Glassware must be scrupulously cleaned. This procedure is detailed in the Organic Extraction Cleaning and Handling SOP/02-03. Store dry glassware in a clean environment.

4.2 Parameters

4.2.1 All solvents used are pesticide grade or equivalent, and reagents are purchased as certified contaminant free. All of these materials are routinely determined to be free of interferences by analysis of extraction blanks with every extraction batch performed.

4.2.2 Certain compounds (i.e. phthalates) can be extracted from the sample matrix and be detected by the ECD that could possibly result in false positive results or complicate the data interpretation. The use of the cleanup procedure mentioned in Section 2.1 and detailed in the extraction SOP minimizes these possible interferences. Analyst experience is also crucial in making compound determinations.

4.2.3 Interferences co-extracted from the samples will vary considerably from waste to waste. While a general cleanup technique is referenced or provided as part of the method, unique samples may require additional cleanup approaches to achieve desired degrees of discrimination and quantitation.

5. Health and Safety

The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound must be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material data handling sheets is available to all personnel involved in the chemical analysis. PCBs have been tentatively classified as known or suspected human or mammalian carcinogens. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.1 Lab coats, safety glasses, and gloves must be worn when handling samples, extracts, standards or solvents.

5.2 All solvent and extract transfers must be handled in the vented bench area in the GC laboratory.

5.3 All stock standards, working standards, and vialed sample extracts must be placed into the waste bucket in the lab, for future disposal by the Hazardous Waste Manager. The container must be labeled properly with hazard warning labels indicating the container contents.

5.4 Bottles containing flammable solvents must be stored in the flammables cabinet.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection

Aqueous samples are collected in two 1L amber glass jars with teflon-lined lids. Solid samples are collected in one 250 mL wide-mouth glass jar with a teflon-lined lid. All containers are purchased pre-cleaned and certified from commercial vendors.

6.2 Sample Preservation

Both aqueous and solid samples are then preserved by packing in coolers with ice or ice packs, to maintain a temperature of 4 ± 2° C. Upon receipt at the laboratory, the samples are transferred into sample storage refrigerators to maintain at a temperature of 4 ± 2° C.

6.3 Sample Handling

Aqueous samples must be extracted within 7 days of sample collection, solid samples within 14 days of collection. Once extracted, the samples must be analyzed within 40 days of the extraction date.

7. Equipment and Supplies

7.1 Gas Chromatograph, Hewlett Packard 6890: An analytical system complete with gas chromatograph configured for split-splitless injection and all required accessories including syringes, analytical columns, gases, electron capture detectors (ECD), and data system.

7.2 GC Columns: Alpha utilizes dual-column analyses. The dual-column approach involves either a single injection that is split between two columns that are mounted in a single gas chromatograph, or dual injections of the split extract on a single GC equipped with two columns. Typical column pairs used are listed below. Other columns may be used as long as method performance criteria can be met.

7.2.1 Column pair 1

30m x 0.32mm ID fused silica capillary column chemically bonded with SE-54 (RTX-CLP or equivalent), 0.32µm film thickness.

30m x 0.32mm ID fused silica capillary column chemically (CLP-pesticideII, or equivalent) 0.25µm film thickness.

7.3 Volumetric Flasks: 10mL and 25mL, for the preparation of standards.

7.4 Microsyringes/Wiretrol syringes: 10 µL – 1000 µL

7.5 Disposable Borosilicate Pipets

7.6 Vials: 2 mL clear glass, crimp-top and screw-cap.

8. Reagents and Standards

Reagent grade or pesticide grade chemicals are used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficient high purity to permit its use without lessening the accuracy of the determination.

NOTE: Store the standard solutions (stock, composite, calibration, internal, and surrogate) at 4 ± 2° C in Teflon(R)-sealed containers in the dark. When a Lot of standards is prepared, aliquots of that Lot are stored in individual small vials. All stock standard solutions must be replaced after one year or sooner if routine QC tests indicate a problem. All other standard solutions must be replaced after six months or sooner if routine QC indicates a problem.

8.1 n-Hexane: Pesticide quality or equivalent.

8.2 Acetone: Pesticide quality or equivalent.

8.3 Methylene chloride: Pesticide quality or equivalent.

8.4 Organic-free Reagent Water: All references to water in this method refer to organic-free reagent water from Alpha's RO water treatment system.

8.5 Stock Standard Solutions: All stock standard solutions are purchased from commercial vendors as ampulated certified solutions. When an ampulated stock solution is opened, it is transferred to a labeled amber screw-cap vial. The expiration date of the stock solution is either the vendor specified expiration date, or 1 year from the date the ampule was opened, whichever is sooner. Typical stock standard concentrations are listed in Table 1.

8.6 Calibration Standards: Calibration standards are prepared volumetrically by diluting the appropriate stock standard(s) with hexane. Calibration standards expire 6 months from the date of preparation, or on the earliest expiration date of any of the stock solutions used to prepare the calibration standard. Calibrations are performed at the 6 concentration levels listed in Table 1.

8.7 Internal Standard Solution: 1-Bromo-2-nitrobenzene is used as the internal standard, and is added to all single-component calibration standards and sample extracts to achieve a concentration of 0.25 µg/mL.

8.8 Surrogate Standards:

8.8.1 Tetrachloro-m-xylene and Decachlorobiphenyl are used as surrogates for Aroclor analysis. They are added to the calibration standards at the concentrations listed in Table 1, and are spiked into all samples and QC samples prior to extraction. The spiking solution is prepared in acetone at the concentrations listed in Table 1.

8.9 LCS/MS Spiking Solutions: The LCS/MS spiking solutions are prepared volumetrically by diluting the appropriate stock standards in acetone. The spiking solution concentrations are listed in Table 1.

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 Blank(s)

Extraction blanks are performed with each extraction batch of 20 or less samples, according to the extraction SOPs. The extraction blank must not contain any of the reportable analytes above the reporting limit. If any reportable analytes are detected in the blank, the entire extraction batch is suspect and re-extraction of all associated samples is required, unless the associated samples are non-detect.

9.2 Laboratory Control Sample (LCS)

A Laboratory Control Sample (LCS) is extracted with each analytical batch. The LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume. For Aroclor analysis, the LCS is spiked with a mixture of Aroclor 1016 and 1260. The concentrations of the spiking solutions are listed in Table 1. The recovery acceptance criteria are listed in Table 2. If any recovery criteria are not met, the extract may be re-analyzed. If the criteria are still not met, the entire batch is re-extracted, unless the recoveries are high and the associated samples are non-detect. If this is not possible, due to insufficient sample or holding time exceedence, the analyst must narrate the failure in the LIMSfor inclusion in the client report.

9.3 Initial Calibration Verification (ICV)

Refer to Section 10.2.

9.4 Continuing Calibration Verification (CCV)

Refer to Section 10.4.

9.5 Matrix Spike

Upon client request, a matrix spike and matrix spike duplicate pair is extracted and analyzed with each batch of 20 or less samples. The MS/MSD pair is extracted and analyzed for standard PCB analysis. The PCB spike compounds and concentrations are listed in Table 1. The recovery acceptance criteria are listed in Table 2. If the recovery criteria are not met, but are met in the LCS, the failure may be attributed to sample matrix effects and must be narratedfor inclusion in the client report.

9.6 Laboratory Duplicate

Upon client request, a Laboratory Duplicate is extracted and analyzed with each batch of 20 or less samples. The relative percent difference (RPD) acceptance criteria are listed in Table 2. If the RPD criteria are not met, the failure may be attributed to matrix effect and must be narrated for inclusion in the client report.

9.7 Method-specific Quality Control Samples

9.7.1 **Surrogates:** All extracted samples and associated QC are spiked with surrogates at the levels listed in Table 1. The laboratory must evaluate surrogate recovery data from individual samples and QC samples versus the surrogate control limits listed in Table 2. If the surrogate limits are not met, the extract may be reanalyzed to determine if the failure was due to an instrument problem. If the criteria are still not met, the affected samples must be re-extracted to confirm that the failure was due to sample matrix, unless the surrogate recovery is high and the associated sample is non-detect. If matrix effect is confirmed, this must be noted on a narrative sheet for inclusion in the client report.

9.8 Method Sequence

Typical Initial calibration (each level to identify the standard lot number)

2. Std Level 1
3. Std Level 2
4. Std Level 3
5. Std Level 4
6. Std Level 5
7. Std Level 6
8. Initial Calibration Verification Standard (ICV)

Repeat steps 2 – 7 as needed for each Aroclor necessary for calibration.

[**NOTE:** If multiple calibration mixtures are analyzed, it is acceptable to analyze appropriate ICVs after all calibration standards have been injected.]

Typical Daily sequence:

1. 1016/1260 Continuing Calibration Standard; identified with the standard lot number 2. Extraction Blank
3. Laboratory Control Sample
4. Matrix Spike / Matrix Spike Duplicate (if requested by Client)
5. Duplicate (if included with batch QC)
6. Samples (4 – 8)
7. Cal check (Typically alternating the Aroclors)

Repeat 2 – 7 (as needed)

10. Procedure

10.1 Equipment Set-up

10.1.1 Sample Extraction

Water samples are extracted at a neutral pH with methylene chloride using a separatory funnel (Method 3510). See extraction SOP for details.

Solid samples are extracted with methylene chloride: acetone (1:1) using Soxhlet extraction (Method 3540C) procedures. Solid samples may also be extracted with hexane: acetone (1:1) using Method 3546 (microwave). See extraction SOP for details.

10.1.2 Extract Cleanup

Cleanup procedures may not be necessary for a relatively clean sample matrix, but most extracts from environmental and waste samples will require additional preparation before analysis. The sulfuric acid cleanup method (Method 3665) is utilized. See extraction SOPs for details as well as the Copper cleanup method (method 3660B).

10.1.3 GC Conditions:

The dual-column / dual-detector approach involves the use of the columns listed in section 7.2. The columns are connected to an injection tee or dual injection GC, and separate electron capture detectors. Typical GC conditions for the HP 6890 instruments utilizing column pair 1, are listed below, but may be altered as long as method performance criteria are met.

Temperature 1:	120 °C
Time 1:	0 minute
Ramp 1:	35 °C/minute
Temperature 2:	200 °C
Time 2:	0 minutes
Ramp 2:	15° C/minute
Temperature 3:	260 °C
Time 3:	0 minute
Ramp 3:	°C/minute
Final temperatur	325 °C
Final time:	2.00 minutes
Injector temperature:	250 °C
Injector mode:	Pulsed Split
	2:1 split, 0.75 min pulse
Injector Flow:	6.0 mL/min split flow
Detector temperature:	375 °C
Carrier gas:	Helium
Carrier flow:	3 mL/min
Carrier mode:	Constant flow
Makeup gas:	Argon/methane (P5)
Total detector flow:	55 mL/min

Injection volume: 1 µL

10.2 Initial Calibration

10.2.1 Prepare calibration standards using the procedures in Section 8.6 and Table 1. The calibration standards are aliquoted into autosampler vials and capped prior to loading onto the autosampler tray.

10.2.2 Establish the GC operating conditions by loading the appropriate GC method. Typical instrument conditions are listed in section 10.1.3. The same operating conditions are used for calibrations and sample analyses. Create the analytical sequence using the Turbochrom or Agilent Chemstation data acquisition software.

Record the calibration standard, unique lab identifier code (lot), concentration, and analyst's initials in the analytical sequence list.

10.2.3 A 1µL injection volume of each calibration standard is typically used. Other injection volumes may be employed, provided that the analyst can demonstrate adequate sensitivity for the compounds of interest. The same injection volume must be used for all standards and samples.

10.2.4 Column adsorption may be a problem when the GC has not been used for a day or more or after system maintenance. The GC column may be primed (or deactivated) by injecting a PCB standard mixture approximately 20 times more concentrated than the mid-concentration standard. Inject this standard mixture prior to beginning the initial calibration or calibration verification.

Alternately, the system may be primed by baking at the final analytical temperature for approximately 30 minutes.

Several analytes may be observed in the injection just following system priming. Always run an instrument blank after system priming.

10.2.5 Calibration Factors

Internal standard calibration techniques are employed in this method.

10.2.5.1 Internal Standard Procedure. In each standard, calculate the response factor (RF) for each analyte, the average RF, and the relative standard deviation (RSD) of the RFs, using the Target or Enviroquant data processing software. The calculations are performed automatically, using the formulae listed in Alpha's Quality Manual.

10.2.6 Initial Calibration Criteria

If the RSD for an analyte is $\leq$ 20%, then the response of the instrument for this compound is considered linear over the range and the mean calibration factor can be used to quantitate sample results.

If the RSD for any analyte is > 20%, then linearity through the origin cannot be assumed. The mean response factor cannot be used for quantitation. An alternative calculation may be done by the use of linearity as long as the correlation coefficient is $\geq$0.995. If both of these quantitation methods fail criteria for any compound in the initial calibration, then the system must be reevaluated and a new calibration curve must be analyzed.

10.2.6.1 Initial Calibration Verification

An initial calibration verification standard must be run immediately after each initial calibration, near the midpoint of the curve. The standard must be prepared using a second source that is different than the source used for the initial calibration. The %D is the same as the CCV (see Section 10.4.1.1).

10.2.7 Retention Time Window

10.2.7.1 The retention time window used for the identification of target analytes is ± 0.07 minutes. These criteria have been adopted from the EPA CLP Statement of Work (OLM04.2). It has been found that these limits work well, being wide enough to eliminate false-negatives while being tight enough to eliminate false-positives. Windows that are calculated using the procedure recommended in Method 8000 tend to be very narrow, creating the risk of false negative results.

10.2.7.2 The windows listed above are used as guidance; however the experience of the analyst weighs heavily in the interpretation of the chromatograms. For example, it has been observed that certain oil matrices can cause the retention times to shift more dramatically.

10.3 Equipment Operation and Sample Processing

10.3.1 The same GC operating conditions used for the initial calibration must be employed for sample analyses, including sample injection volume (Section 10.1.3).

10.3.2 Tentative identification of an analyte occurs when a peak from a sample extract falls within the retention time window for the compound. Each tentative identification is confirmed using a second GC column of dissimilar stationary phase. Confirmation is positive when the %RPD is ≤ 40% from the results of the two columns.

10.3.2.1 In addition to utilizing retention time windows, the pattern of peaks in the sample extract is compared to the known Aroclor patterns.

10.3.3 The concentration reported for an identified target analyte in an extract is calculated using the Target or Enviroquant data processing software. Proper quantitation requires the appropriate selection of a baseline from which the peak area or height can be determined. See the Manual Integration SOP for integration guidelines.

10.3.3.1 If the responses exceed the calibration range of the system, dilute the extract with Hexane and reanalyze.

10.3.4 Each sample analysis must be bracketed with an acceptable calibration verification standard (each 12-hour analytical shift), or calibration verification standards interspersed within the samples, with the exception of those samples analyzed under WCS-CAM-VA. When a calibration verification standard fails to meet the QC criteria, all samples that were injected after the last standard that last met the QC criteria must be re-injected.

Calibration verification standards that are interspersed throughout the analytical sequence are varied to verify performance of all analytes.

10.3.5 Sample injections may continue for as long as the calibration verification standards and standards interspersed with the samples meet instrument QC requirements. Standards are typically analyzed after every 4 – 8 samples to minimize the number of samples that must be re-injected when the standards fail the QC limits. However, a calibration verification standard must be analyzed after every 20 samples. The sequence ends

when the set of samples has been injected or when qualitative and/or quantitative QC criteria are exceeded.

10.3.6 Use the calibration standards analyzed during the sequence to evaluate retention time stability. The retention time windows are established using the absolute retention time of each analyte in the mid-concentration standard during the initial calibration as the mid-point of the window. The widths of the windows are defined in Section 10.2.7.

10.3.7 Each subsequent injection of a standard during the 12-hour analytical shift (i.e., those standards injected every 20 samples, or more frequently) must be checked against the retention time windows. If any of these subsequent standards fall outside their absolute retention time windows, the GC system is out of control. Determine the cause of the problem and correct it. If the problem cannot be corrected, a new initial calibration must be performed.

10.3.8 Identification of mixtures (i.e. Aroclor 1248) is based on the characteristic 'fingerprint' retention time and shape of the indicator peak(s); and quantitation is based on the area under the characteristic peaks as compared to the area under the corresponding calibration peaks(s) of the same retention time and shape generated using internal calibration procedures.

10.3.9 If compound identification or quantitation is precluded due to interference (e.g., broad, rounded peaks or ill-defined baselines are present) cleanup of the extract may be needed. If instrument problems are suspected, rerun the extract on another instrument to determine if the problem results from analytical hardware or the sample matrix. Refer to the extraction SOPs for the procedures to be followed in sample cleanup.

10.4 Continuing Calibration

10.4.1 Verify calibration each 12-hour shift by injecting calibration verification standards prior to conducting any sample analyses. A calibration standard must also be injected at intervals of not less than once every twenty samples (after every 4 - 8 samples is routine practice to minimize the number of samples requiring re-injection when QC limits are exceeded) and at the end of the analysis sequence.

10.4.1.1 The response factor (for internal standard compounds) for each analyte to be quantitated must not exceed a ± 15% difference when compared to the initial calibration curve. The Target data processing software automatically calculates the %D for all analytes according to the formulae in Alpha's Quality Manual.

10.4.1.2 If this criterion is exceeded, inspect the gas chromatographic system to determine the cause and perform whatever maintenance is necessary before verifying calibration and proceeding with sample analysis.

10.4.1.3 If routine maintenance does not return the instrument performance to meet the QC requirements (Section 9) based on the last initial calibration, then a new initial calibration must be performed. Due to the large number of analytes present, allowances may be made for a RF that drifts out high, as long as there are no positive hits for that particular analyte in any of the associated samples. Any QC failures must be narrated in the LIMS for inclusion with the sample data.

10.4.2 Compare the retention time of each analyte in the calibration standard with the absolute retention time windows described in section 10.2.7. The center of the absolute retention time window for each analyte is its retention time in the mid-concentration standard analyzed during the initial calibration. Each analyte in each standard must fall within its respective retention time window. If not, the gas chromatographic system must either be adjusted so that a second analysis of the standard does result in all analytes falling within

their retention time windows, or a new initial calibration must be performed and new retention time windows established.

10.5 Preventive Maintenance

10.5.1 Preventive Maintenance

Routine preventive maintenance is performed to maintain GC system performance. This includes periodic replacement of injector septa, replacement of injector liner(s), and replacement of injector seals.

10.5.2 Other Maintenance

ECD detectors may become contaminated, requiring bake out at elevated temperatures, or repair by the manufacturer.

11. Data Evaluation, Calculations and Reporting

11.1 Quantitation of Aroclors

Per Method 8082, quantitation is based on the use of a minimum of 3 of the major peaks present in the analyte, although the use of 5 of the major peaks is recommended. Each of these peaks is individually calibrated with a minimum of five calibration points based on average response factors. The %RSD must meet the criteria of ≤20% for the ICAL. The five major peaks are calculated as described below. After individual calculation meets criteria, the average of the peaks selected for quantitation is used to determine the final concentration.

11.1.1 Aqueous samples

$$\text{Concentration } (\mu g/L) = \frac{C \times DF \times Vf \times 1000}{Vo}$$

where:

C = Extract concentration (µg/mL), **NOTE**: ng on column = ng/injection volume = ng/uL = ug/mL
DF = Dilution factor
Vf = Final extract volume (mL)
Vo = Sample volume (mL)

11.1.2 Soil/sediment samples

$$\text{Concentration } (\mu g/Kg, \text{ dry weight}) = \left[\frac{C \times DF \times Vf \times 1000}{W\ (gm)}\right] \div \%S$$

where:

C = Extract concentration (µg/mL), **NOTE**: ng on column = ng/injection volume = ng/uL = ug/mL
DF = Dilution factor
Vf = Final extract volume (mL)
W = Weight of the sample extracted (10g for high, 30g for low)
%S = Percent solids, as a decimal value

11.1.3 Reporting Results

11.1.3.1 After performing technical data review, validating that all QC criteria have been met and confirming all positive hits, the data report is sent electronically to the LIMS computer for generation of the client report. There are two levels of review of the data in the LIMS system prior to release of data. These reviews must be done by two separate individuals.

11.1.3.2 Reporting Results for PCBs in Caulk Samples

If the sample concentration as calculated above for any Aroclor is > 50ppm, the Client is contacted by a Customer Service Representative and these results are sent to the LIMS and reported to the Client.

If the sample concentration as calculated above for any Aroclor is < 50ppm, the sample is sent for re-extraction by Method 3540C (Alpha SOP/02-04).

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

Holding time exceedence and/or improper preservation are noted on the nonconformance report form.

Perform instrument maintenance as described throughout this SOP as needed when instrument calibration criteria are not met. Record all maintenance in the instrument logbook.

All batch and sample specific QC criteria outlined in Section 10 are evaluated by the analyst prior to approval of the data. When any QC criteria fail, the cause for the failure must be identified and corrected. This may include instrument recalibration followed by sample reanalysis, sample cleanup, or sample re-extraction. If it is determined that the failure is due to sample matrix effects, a project narrative report is written into the LIMS by the analyst for inclusion in the data report. If there is insufficient sample volume to perform the re-analysis for confirmation, this is also noted in the narrative and included in the client report.

13. Method Performance

13.1 Method Detection Limit Study (MDL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

The laboratory follows the procedure to determine the MDL, LOD, and/or LOQ as outlined in Alpha SOP/08-05. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

Refer to Alpha SOP/08-12 for further information regarding IDC/DOC Generation.

13.2.1 Initial (IDC)

The analyst must make an initial, one-time, demonstration of the ability to generate acceptable accuracy and precision with this method, prior to the processing of any samples.

13.2.2 Continuing (DOC)

The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

Refer to Alpha's Chemical Hygiene Plan and Waste Management and Disposal SOP for further pollution prevention and waste management information.

15. Referenced Documents

Chemical Hygiene Plan

SOP/08-05 MDL/LOD/LOQ Generation

SOP/08-12 IDC/DOC Generation

SOP/14-01 Waste Management and Disposal SOP

16. Attachments

Table 1: STANDARD SOLUTIONS

Table 2: QC ACCEPTANCE CRITERIA

TABLE 1

STANDARD SOLUTIONS

	Stock solution (ug/mL)	Level 6 (ug/mL)	Level 5 (ug/mL)	Level 4 (ug/mL)	Level 3 (ug/mL)	Level 2 (ug/mL)	Level 1 (ug/mL)	Spike Solution (ug/mL)	LCS Solution (ug/mL)
PCB 1016/1260 Mix									
Aroclor 1016	100	0.1	10	5	2.5	1.0	0.5	12.5	12.5
Aroclor 1260	100	0.1	10	5	2.5	1.0	0.5	12.5	12.5
Aroclors 1221, 1232, 1242, 1254, 1262, 1268	100	0.1	10	5	2.5	1.0	0.5		
Internal Standard									
1-Bromo-2-Nitrobenzene	5000	0.25	0.25	0.25	0.25	0.25	0.25		
Surrogates: Aroclor Analysis									
Tetrachloro-m-xylene	2.0	0.64	0.32	0.16	0.08	0.04	0.02		
Decachlorobiphenyl	2.0	1.28	0.64	0.32	0.16	0.08	0.04		

TABLE 2

QC ACCEPTANCE CRITERIA

	Aqueous		Soil	
Surrogate % Recovery: Aroclor Analysis	**Lower Control Limit**	**Upper Control Limit**	**Lower Control Limit**	**Upper Control Limit**
2,4,5,6-Tetrachloro-m-xylene	30%	150%	30%	150%
Decachlorobiphenyl	30%	150%	30%	150%

	Aqueous % Recovery		Soil % Recovery		Duplicate and/or MSD	
MS/MSD and LCS	**Lower Control Limit**	**Upper Control Limit**	**Lower Control Limit**	**Upper Control Limit**	**Aqueous RPD**	**Soil RPD**

Aroclor 1016	40%	140%	40%	140%	30%	50%
Aroclor 1260	40%	140%	40%	140%	30%	50%

Soxhlet Extraction

References: **EPA Method 3540C** SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, 1997.

Analysis of Extractable Petroleum Hydrocarbon Compounds (EPH) in Aqueous and Soil/Sediment/Sludge Matrices, New Jersey Dept. of Environmental Protection Site Remediation Program, (version 1.1), October 2009 Revision 2

Method 8081, Reference: SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, 1997.

Method 8082, Reference: SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, 1997.

Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), Massachusetts DEP, ORS, BWSC. MADEP-EPH-04-1, Revision 1.1 May 2004.

CT-ETPH, Environmental Research Institute – University of Connecticut, March 1999.

Maine 4.1.25, Maine Health and Environmental Testing Laboratory, 09/06/1995.

EPA 8015B (Modified), SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, December 1996

Extractable Petroleum Hydrocarbons Methodology, New Jersey Department of Environmental Protection, **NJDEP EPH** 10/08, Revision 2 October 2009.

1. Scope and Application

Matrices: This method is applicable to solids, soils, and sludges.

Definitions: Refer to Alpha Analytical Quality Manual.

This method is applicable to the extraction of semivolatile organic compounds from solids such as soils, sludges, and wastes. The Soxhlet extraction procedure ensures intimate contact of the sample matrix with the extraction solvent.

This method is applicable to the extraction of a variety of semivolatile organic compounds, which are then be analyzed by the appropriate chromatographic procedure(s).

The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one or more of the following laboratory personnel before performing the modification: Area Supervisor, Department Supervisor, Laboratory Director, or Quality Assurance Officer.

This method is restricted to use by or under the supervision of trained analysts. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability and completing the record of training.

After initial demonstration, ongoing demonstration is based on acceptable laboratory performance of at least a quarterly laboratory control sample or acceptable performance from an annual proficiency test sample. A major modification to this procedure requires demonstration of performance. The identification of major method modification requiring performance demonstration is directed by the Quality Assurance Officer and/or Laboratory Director on a case-by-case basis.

2. Summary of Method

Weighed samples, around 15 grams, are prepared for extraction by mixing the sample with anhydrous sodium sulfate until the sample is free flowing. The sample is then placed in a Soxhlet extractor using the appropriate solvent (Table 1). The extract is allowed to cool prior to proceeding with additional extract preparation steps.

Any water is removed from the sample extract by filtering through a powder funnel containing approximately 20g of anhydrous sodium sulfate. The extract is then concentrated and, as needed, exchanged into a solvent compatible with the cleanup or determinative step being employed.

2.1 Method Modifications from Reference

None.

3. Reporting Limits

Refer to analytical method SOPs for Reporting Limit information.

4. Interferences

4.1 The most common cause of contamination is from improperly cleaned glassware and lab supplies. All glassware and re-useable extraction equipment (i.e. spatulas) must be scrupulously cleaned, following the cleaning SOP.

4.2 Impurities in solvents and reagents may also yield artifacts and/or interferences that may compromise the results of sample analysis. All of these materials must be demonstrated to free from interferences under the conditions of extract preparation and analysis by preparing method blanks with each extraction batch. The same solvents and reagents are used for the method blank and the associated samples.

4.3 Phthalate esters contaminate many types of products used in the laboratory. Plastic materials must not contact the samples or extracts, as phthalates could be easily leached from the plastic. The exception is in the use of various pre-packed reagent cartridges (Florisil, Silica gel) used in the extract cleanup steps. Each new lot of cartridges is checked for contamination, and is monitored on an on-going basis through the analysis of method blanks.

4.4 Additional specific interference or contamination concerns are addressed in the various analytical SOPs

5. Health and Safety

The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material safety data sheets is available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.1 Lab coats, safety glasses, and gloves must be worn when handling samples, extracts, standards or solvents and when washing glassware.

5.2 All extract concentration steps must be performed in the extraction hoods. All solvent and extract transfers must also be handled in the hood.

5.3 All expired stock standards, working standards, and spent sample extracts must be placed into the waste bucket in the lab, for future disposal by the Hazardous Waste Manager. The container must be properly labeled with hazard warning labels indicating the container contents.

5.4 Bottles containing flammable solvents must be stored in the flammables cabinet or in the vented cabinets found under the hoods

5.5 All waste solvents must be transferred to the satellite waste storage containers located in the extraction lab. Separate containers are provided for chlorinated and non-chlorinated solvents and must be used accordingly. Under no circumstances are solvents to be poured down the sink drains.

5.6 Inspect all glassware prior to use. Do not use any glassware that is chipped, cracked or etched if it could present a safety hazard. Damaged glassware is put aside for repair, otherwise discard the piece.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection

Sample collection and preservation requirements are described in the various analytical method SOPs.

6.2 Sample Preservation

None.

6.3 Sample Shipping

No specific requirements.

6.4 Sample Handling

All soil samples are stored, refrigerated, in the Custody Sample Bank. Samples are taken by the analyst immediately prior to sample extraction. The analyst must take custody of the samples by signing them out utilizing the LIMS.

All samples must be fully homogenized prior to taking the sample aliquot, as described in Section 10.1.2. After the sample aliquot is removed, the samples are returned to the Sample Bank and placed in the sample return refrigerator. Custody of the samples is transferred back by signing them back in utilizing the LIMS.

After the extraction is performed, the sample extract is stored in a stoppered Concentrator tube before being transferred to a crimp-top or screw cap vial for analysis and long-term storage (See Work Form Cleanup and Vialing 02-50).

7. Equipment and Supplies

7.1 Small Soxhlet Extractor: 45/50, with 250mL or 300mL round bottom flask.

7.2 Refrigerated Water Recirculator: Allows solvents to cool in the condenser while extracting.

7.3 Analytical Balance: Capable of weighing to 0.1g.

7.4 Heating Mantle: Rheostat controlled.

7.5 Heating Plate: Rheostat controlled.

7.6 Spatulas: Stainless steel and Teflon.

7.7 Beakers: 250mL, 400mL.

7.8 Aluminum weighing dishes: VWR Cat #25433-089.

7.9 Mortar and Pestle: Capable of reducing particle size to <1mm.

7.10 Kuderna-Danish (KD) apparatus: Assemble by attaching the Concentrator Tube to the Evaporation Flask using the Plastic clip. Add the Macro column to the Evaporation Flask. The Micro Snyder Column is attached directly to the Concentrator Tube using the Plastic Clip.

7.10.1 Concentrator tube: 25mL, graduated and calibrated. A ground-glass stopper is used to prevent evaporation of extracts.

7.10.2 Evaporation flask: 500mL.

7.10.3 Snyder column: Three-ball macro.

7.10.4 Snyder column: Micro.

7.10.5 Plastic clamps

7.11 Water Bath: Heated, capable of temperature control (± 5°C). The bath must be used in a hood.

7.12 Boiling Chips: Solvent-extracted, approximately 10/40 mesh (silicon carbide).

7.13 Autopipettes: 250, 1000µL

7.14 Brady labeling system: Thermal label generator

7.15 Powder Funnel.

7.16 Glass wool: SUPELCO, silane treated.

7.17 N-EVAP: Organomation; utilized for micro blow down.

7.18 Turbo Vap II: Auto-concentrator; Caliper Life Sciences.

7.19 Zymark Tubes: 50mL or 200mL

7.20 Gauze Pad: 2"x2" 12 ply, Used as a blank matrix for wipe samples

7.21 Autovial-Syringless Filter Device- 0.45um PTFE Membrane

8. Reagents and Standards

Reagent grade inorganic chemicals are used in all tests. All reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades are used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

8.1 Reagent Water: All references to water in this method refer to reagent water from Alpha's DI water treatment system.

8.2 Sodium Sulfate (Na_2SO_4): Granular anhydrous; purified by baking at 400°C for 4 hours in a shallow tray. Store in closed glass containers. All references to sodium sulfate in this method refer to this prepared reagent.

8.3 Methylene Chloride: Pesticide quality or equivalent. No expiration date listed.

8.4 Hexane: Pesticide quality or equivalent. No expiration date listed.

8.5 Acetone: Pesticide quality or equivalent. No expiration date listed.

8.6 1:1 Acetone/Methylene Chloride: Using a 2000mL Graduated Cylinder add 2000mL of Acetone and 2000mL of Methylene Chloride to a 4 Liter amber bottle and record preparation.

8.7 Nitrogen Gas: Reagent grade, used to purge and pressurize the extraction cell and as the blow-down gas in the Turbovap II auto-concentrator units and the N-EVAP.

8.8 Spiking Solutions: The various surrogate and LCS/MS spiking solutions used in the extraction steps are listed in Table 2. The preparation and expiration dates of these solutions are described in the analytical SOPs.

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

Each extraction batch contains various QC samples used to ensure the validity of the sample results. The particular QC elements performed for a given extraction batch are determined by the requirements of the determinative method. The purpose and definition of the QC samples performed are listed below. The specific QC requirements of the analytical methods are listed in Table 2.

9.1 Blank

Blanks, or method blanks, are measured aliquots of clean matrix (typically sodium sulfate for soil extractions) that are treated identically to the associated samples. Surrogates are added, and the blanks are carried through all stages of the sample extraction, concentration, and cleanup procedures. Blanks serve to ensure that no systematic contamination exists. A blank is extracted with each batch or 20 or less samples.

9.2 Laboratory Control Sample / Laboratory Control Sample Duplicate (LCS/LCSD)

LCS samples are measured aliquots of clean matrix (typically sodium sulfate for soil extractions) that are spiked with a solution containing known amounts of target compounds, in addition to the surrogate solution. The LCS is carried through all stages of the sample extraction, concentration, and cleanup procedures. LCS samples serve as batch specific quantitative checks of the extraction. An LCS is extracted with each batch of 20 or less samples.

An LCSD is performed in addition to an LCS for most methods, as well as in lieu of the MS/MSD or Duplicate when there is insufficient sample volume available. The required solutions and volumes are listed in Table 2.

9.3 Initial Calibration Verification (ICV)

Not Applicable.

9.4 Continuing Calibration Verification (CCV)

Not Applicable.

9.5 Matrix Spike / Matrix Spike Duplicate (MS/MSD)

MS and MSDs are field samples spiked with a known quantity of the target analyte(s). They are prepared by taking additional sample aliquots, and adding the appropriate amounts of surrogate and spiking solutions. The MS/MSD are carried through all stages of the sample extraction, concentration, and cleanup procedures. MS samples serve as a measure of extraction accuracy, by allowing the comparison of the found amount(s) of target analyte(s) with the spiked amount(s). An MS/MSD set also allows for the calculation of the extraction precision, by comparing the results of the two samples.

9.6 Laboratory Duplicate

Duplicates are laboratory selected replicate samples, prepared by taking an additional sample aliquot of a sample. The duplicate is carried through all stages of the sample extraction, concentration, and cleanup procedures. Duplicates serve as a measure of the extraction precision, by comparing the results of the sample and duplicate.

9.7 Method-specific Quality Control Samples

9.7.1 Surrogate

Surrogates are compounds specified by the analytical method that are added to all samples and QC samples prior to beginning the extraction process. Surrogate recoveries are calculated and serve as a sample specific quantitative check of the extraction. The various spiking solutions are prepared according to the directions found in the analytical SOPs. The required solutions and volumes used are listed in Table 2.

9.8 Method Sequence

See Section 10.

10. Procedure

10.1 Sample Preparation and Extraction

10.1.1 Before starting the extraction process, each soil or sediment sample should be visually inspected. If a sample contains a significant amount of free water, notify your supervisor. Record this in the Electronic Laboratory Notebook (ELN). Throughout the extraction process samples are labeled following Work Instruction WI/02-03, Labeling and Generating Work Groups and Batches.

Any artifacts (rocks, leaves, sticks, or similar materials) are not typically considered part of the soil sample and should not be included. If necessary, transfer these artifacts to another container prior to homogenizing the sample. Note the presence of sample artifacts in the ELN. Gummy, fibrous, or oily materials not amenable to grinding should be cut, shredded, or otherwise reduced in size to allow mixing and maximum exposure of the sample surfaces for the extraction. The addition of anhydrous sodium sulfate to the sample (1:1) may make the mixture amenable to grinding. If this needs to be done, weigh the sample prior to addition of the sodium sulfate.

10.1.2 Homogenize the sample well by mixing the entire contents of the sample container. In instances where the sample container is filled to the top and packed in tightly, the entire sample contents are emptied into a larger glass container (400mL glass beaker) and homogenized. If this is difficult due to sample matrix, describe the non-homogeneity in the ELN. Place the 300mL beaker or aluminum weighing dish (if the sample is a PCB) onto the tared balance. Weigh 14-16 grams of sample and record in the ELN. Add approximately 15g anhydrous sodium sulfate to the beaker and mix with a spatula until a free flowing powder is obtained. For samples that contain higher amounts of water or organic matter, larger amounts of sodium sulfate may be required. Certain samples may require grinding with a mortar and pestle to achieve the free flowing consistency.

10.1.2.1 For wipe (matrix 7) samples: Use the entire sample, pour it directly into the soxhlet set-up (see 10.1.3 for details on soxhlet extractor set-up).

10.1.3 See Work Instruction **WI**/02-03 for proper glassware labeling procedures. For each QC sample and extraction sample pour approximately 200mL of the extraction solvent (Section Table 1) into a 250mL or 300mL round bottom flask containing one or two clean boiling chips. .Attach the flask to the extractor. Plug the extractor siphon tube with a wad of glass wool using a stainless steel spatula. Add approximately 10-15 grams of sodium sulfate to the extractor to hold the glass wool in place. Note, do not clog the siphon tube with sodium sulfate. Using a stainless steel spatula transfer the sample to the soxhlet extractor.

10.1.4 Using the auto pipette, add the appropriate volume(s) of surrogate and spike solution(s) listed in Table 2 to the samples and QC samples. The spiking procedure must be witnessed by another chemist and recorded into the ELN. Attach the soxhlet set-up to the condensers and turn on the hot plates to the calibrated mark. Turn on the chiller serving the soxhlets being extracted. Chiller temp should be pre-set at 13C.

10.1.5 Extract the sample for 16 – 24 hours making sure to achieve four to six cycles/hour.

10.1.6 Allow the extract to cool after the extraction is complete.

10.1.7 After the extract has cooled, drain the solvent from the extractor into the round bottom flask. Tip the Soxhlet to empty. Rinse the Soxhlet with solvent if any residual sample is present. Place the Soxhlet in the hood to allow solvent to evaporate. Once dry, the samples are disposed of in the waste barrels.

10.2 Sample Concentration: KD Technique

10.2.1 Assemble a KD apparatus for each sample and QC by attaching the 25 mL concentrator tube to the bottom of the 500 mL KD flask. Use a blue clip to help insure that they do not separate. Place a boiling stone in the bottom of the concentrator tube. Assemble a powder funnel and place on top of the flask. Drain the sample through this powder funnel and rinse the round bottom 3 times with DCM, pour this rinseate into the KD as well. After the powder funnel is done draining remove and discard it. Alternatively, the sample may be filtered directly into a Zymark Tube for Turbovap concentration(See Section 10.3).

10.2.2 Attach a three-ball Snyder column to the top of the flask. Place the KD apparatus on a hot water bath (heated to approximately 75°C for samples extracted in Methylene Chloride and 95°C for samples extracted in Hexane) so that the concentrator tube is partially immersed in the hot water, and so that the entire lower rounded surface of the flask is bathed in hot water vapor. Adjust the position of the apparatus as required to complete the concentration in 30 to 40 minutes. At the proper rate of distillation, the balls in the column will actively chatter, but the chambers will not flood with solvent. Periodically rinse the internal walls of the concentrator tubes with DCM.

10.2.3 If a Hexane exchange is required (see Table 1), add 30 to 35mL of hexane), when the sample volume reaches approximately 10mLs. Add the hexane to the top of the Snyder column while the concentrator is still on the water bath. Continue with the concentration until the extract volume is reduced to below 10mL. Periodically rinse the internal walls of the synder column with Hexane. Remember to switch the extract to the higher temperature bath after the addition of hexane.

10.2.4 Remove the KD apparatus from the water bath. Rinse the flask and its lower ground glass joint with 1 to 2 mL of acetone to remove any moisture from the outside of the glassware. Allow to cool for 15 minutes. Disassemble the KD apparatus. Move the label from the K-D Flask to the concentrator tube (See WI/02-03).

10.2.5 Place the Concentrator tube on the N-EVAP. The N-EVAP is set at 37°C for samples extracted in Methylene Chloride and 65 °C for samples extracted in Hexane with the nitrogen flow at 5 - 7. Samples remain on N-EVAP until they are reduced to 1mL. Exception: ABN(625,8270,PAH) extracts that have a visual brownish tint or darker, or have sediment in the extract will require filtration through a 0.45um PTFE Autovial. This will eliminate some of the interferences associated with the analysis. While concentrating the extract using the N-evap, once the extract volume reaches 3-5mL remove the sample and transfer to the 0.45um PTFE autovial. Using the supplied PTFE plunger, push the extract through the filter into another 25mL concentrator tube. Remove the plunger from the vial and rinse the membrane with 2-3mL of Methylene Chloride and collect in the

same vial. Place the extract back on the N-evap for final concentration to 1.0mL. Note the use of the autovial in the ELN. Repeat the procedure for all ABN samples that meet the visual filtering requirement. Note that all associated QC samples are required to be filtered as well.

10.2.6 **Pesticide Extracts:** In the concentrator tube, adjust final volume to 10 mL with hexane.

10.2.7 The extract is now ready for sample cleanup or vialing (See Table 1). Refer to the relevant Clean-up SOP or proceed with vialing the extract. See vialing Form(02-50).

10.3 Alternate Concentration Technique

The equipment used for alternate sample concentration is the Zymark TurboVap II, which is a self-contained water bath and nitrogen blow-down. It is equipped with sensors to allow for automatic shutdown when the extract volume goes below 1mL. This technique is generally used for concentration of TPH samples.

10.3.1 The TurboVap is set at 37°C for samples extracted in Methylene Chloride. The nitrogen pressure is set to 10-15 psi and the endpoint concentration is set to 'Sensor'. The Zymark tube is labeled with the sample I.D.

10.3.2 Assemble a powder funnel and place on top of the Zymark tube. Drain the sample through this powder funnel and rinse the round bottom 3 times with DCM, pour this rinseate into the Zymark tube as well. After the powder funnel is done draining remove and discard it.

10.3.3 Place the labeled Zymark tube containing sample into the TurboVap II concentration unit. Start the nitrogen blow-down by pressing the button on the front panel of the unit.

10.3.4 When the concentration is complete, the nitrogen stream will be automatically shut off. The light on the front panel will flash, and the instrument will beep. Remove the tube from the Zymark concentrator; the final extract volume is 1mL. Refer to Form 02-50 for vialing instructions or the appropriate SOP for cleaning procedures.

10.4 Instrument Maintenance

10.4.1 Refrigeration Re-circulator

The Refrigeration Re-circulator should be checked periodically to insure that it is running correctly and that the level of reagent water is constant with manufactures recommendation.

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10.4.2 Zymark Turbovap II Concentrators

10.4.2.1 Maintain the level of the water bath by adding water daily to fill. Routinely discard visually dirty water and refill with clean water. This will extend the life of the extract level sensors in the bath.

10.4.2.2 Keep unit clean. Avoid solvent spills on or around unit. Clean periodically with a damp cloth.

10.4.3 Analytical Balance

10.4.3.1 All balances are calibrated and serviced every six months by an instrument service company. All service records are kept on file.

10.4.3.2 Keep balances clean. Brush off any sample spills immediately. Keep the balance doors closed and the balance turned off when not in use.

10.4.4 Water Bath

10.4.4.1 The water bath should be kept full at all times. Add reagent water as necessary.

10.4.4.2 Keep unit clean. Avoid solvent spills on or around unit. Clean periodically with a damp cloth.

11. Data Evaluation, Calculations and Reporting

Not Applicable.

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

Holding time exceedence and improper preservation are noted on the nonconformance report form.

When analysis of samples indicates possible extraction problems, such as poor surrogate recoveries, poor LCS/MS/MSD recoveries, or suspected contamination in blanks or samples, re-extractions are required. Depending on the particular failure, the re-extraction may be of a specific sample or the entire extraction batch.

The analyst that determines the need for re-extraction must fill out a sample re-extract request form. This form notes the reason for the re-extraction request along with any special requirements, and the date and time that the re-extract is needed. Re-extraction request forms are maintained on file to help track the cause for re-extractions, and to be used as a tool in improving systems to minimize the need for re-extractions.

Depending on the results of the re-extraction, the first, second, or both sets of results may be reported to the client, along with a narrative report detailing the problems encountered and the resolution.

13. Method Performance

13.1 Method Detection Limit Study (MDL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

The laboratory follows the procedure to determine the MDL, LOD, and/or LOQ as outlined in Alpha SOP/08-05. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

Refer to Alpha SOP/08-12 for further information regarding IDC/DOC Generation.

13.2.1 Initial (IDC)

The analyst must make an initial, one-time, demonstration of the ability to generate acceptable accuracy and precision with this method, prior to the processing of any samples.

13.2.2 Continuing (DOC)

The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

Refer to Alpha's Chemical Hygiene Plan and Waste Management and Disposal SOP for further pollution prevention and waste management information.

15. Referenced Documents

Chemical Hygiene Plan

SOP/08-05 MDL/LOD/LOQ Generation

SOP/08-12 IDC/DOC Generation

SOP/14-01 Waste Management and Disposal SOP

WI/02-03 Labeling and Generating Work Groups and Batches

WI/11-02 LIMS Electronic Laboratory Notebook Procedure

16. Attachments

Table 1 – Specific Extraction Conditions for Various Determinative Methods

Table 2 – Soil Extraction Guide

Table 1

Specific Extraction Conditions for Various Determinative Methods

LIMS Product Code	Extraction Solvent	Exchange Solvent Required	Typical Final Volume	Appropriate Cleanup Technique
8082	1:1 DCM/Acetone	hexane	1 mL	Sulfuric acid
8081	1:1 DCM/Acetone	hexane	10 mL	Florisil
8270	1:1 DCM/Acetone	---	1 mL	---
TPH *	DCM	---	1 mL	---
MA EPH	DCM	hexane	1 mL	Silica gel Fractionation
NJ EPH	DCM	hexane	1 mL	Silica gel Fractionation
ETPH	DCM	---	1 mL	Silica gel

***TPH includes the following LIMS Products: TPH-DRO and TPH-DRO-D**

Table 2

Soil Extraction Guide

LIMS Product Code	QC	Solvent	Surrogate Solution	LCS/LCSD MS/MSD Solution
8270	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP ABN
MCP 8270	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP ABN
PAH	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP ABN
MCP PAH	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP ABN
PAH-Low	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP PAH-Low
MCP PAH-Low	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP PAH-Low
8081/ MCP-8081	SB, LCS, LCSD	DCM/ACE	1mL PEST	1mL Pest
NJ/NYTCL-8081	SB, LCS, LCSD	DCM/ACE	250µL PEST	250µL Pest
PCB	SB, LCS, LCSD	DCM/ACE	250µL PEST	250µL PCB
MCP PCB	SB, LCS, LCSD	DCM/ACE	250µL PEST	250µL PCB
EPH	SB, LCS, LCSD	DCM	1mL EPH	1mL EPH
NJ EPH	SB,LCS,LCSD	DCM	1mL NJEPH	1mL NJEPH
EPH / PAH-L	SB, LCS, LCSD	DCM	1mL EPH	1mL EPH
EPH/TPH	SB, LCS, LCSD	DCM	1mL EPH	1mL EPH
ETPH/ ME4125	SB, LCS, MS, Dup	DCM	1mL DRO	1mL ETPH
TPH *	SB, LCS, Dup	DCM	1mL DRO	1mL ETPH

*** TPH includes the following LIMS Products: TPH-DRO and TPH-DRO-D**

APPENDIX B

ANALYTICAL METHOD SENSITIVITY
AND PROJECT CRITERIA TABLE

Analytical Method Sensitivity and Project Criteria Table

Quality Control Information (incl. MDL's & RL's) provided by Alpha Analytical, Inc. of Westborough, MA

EPH - Soil							
Analytes	**MDL mg/Kg**	**RL mg/Kg**	**LCS/MS % Rec**	**MS/MSD % RPD**	**MCP METHOD 1 S-1/GW-1**	**MCP METHOD 1 S-1/GW-2**	**MCP METHOD 1 S-1/GW-3**
Naphthalene	0.0850	0.34	40-140%	< 25%	4	40	500
2-Methyl-Naphthalene	0.0800	0.34	40-140%	< 25%	0.7	80	300
Acenphthalene	0.104	0.34	40-140%	< 25%	1	600	10
Acenaphthene	0.0940	0.34	40-140%	< 25%	4	1000	1000
Fluorene	0.0860	0.34	40-140%	< 25%	1000	1000	1000
Phenanthrene	0.0750	0.34	40-140%	< 25%	10	500	500
Anthracene	0.106	0.34	40-140%	< 25%	1000	1000	1000
Fluoranthene	0.0790	0.34	40-140%	< 25%	1000	1000	1000
Pyrene	0.0900	0.34	40-140%	< 25%	1000	1000	1000
Benzo(a)Anthracene	0.0850	0.34	40-140%	< 25%	7	7	7
Chrysene	0.0840	0.34	40-140%	< 25%	70	70	70
Benzo(b)Fluoranthene	0.0750	0.34	40-140%	< 25%	7	7	7
Benzo(k)Fluoranthene	0.0970	0.34	40-140%	< 25%	70	70	70
Benzo(a)Pyrene	0.108	0.34	40-140%	< 25%	2	2	2
Indeno(1,2,3-cd)Pyrene	0.0610	0.34	40-140%	< 25%	7	7	7
Dibenzo(a,h)Anthracene	0.0690	0.34	40-140%	< 25%	0.7	0.7	0.7
Benzo(g,h,i)perylene	0.0700	0.34	40-140%	< 25%	1000	1000	1000
c9-c18	N/A	6.67	40-140%	< 25%	1000	1000	1000
c19-c369	N/A	6.67	40-140%	< 25%	3000	3000	3000
c11-c22	N/A	6.67	40-140%	< 25%	1000	1000	1000

Surrogates	**% Recovery**
1-Chloro-Octadecane	40-140%
2-Fluorobiphenyl	40-140%
2-Bromonaphthalene	40-140%
o-Terphenyl	40-140%

EPH - Liquid							
Analytes	**MDL ug/L**	**RL ug/L**	**LCS/MS % Rec**	**MS/MSD % RPD**	**MCP METHOD 1 GW-1**	**MCP METHOD 1 GW-2**	**MCP METHOD 1 GW-3**
Naphthalene	1.37	10	40-140%	< 25%	140	1000	20000
2-Methyl-Naphthalene	1.37	10	40-140%	< 25%	10	2000	20000
Acenphthalene	1.24	10	40-140%	< 25%	30	10000	40
Acenaphthene	1.46	10	40-140%	< 25%	20	-	6000
Fluorene	1.38	10	40-140%	< 25%	30	-	40
Phenanthrene	1.15	10	40-140%	< 25%	40	-	10000
Anthracene	1.22	10	40-140%	< 25%	60	-	30
Fluoranthene	1.13	10	40-140%	< 25%	90	-	200
Pyrene	1.07	10	40-140%	< 25%	80	-	20
Benzo(a)Anthracene	1.16	10	40-140%	< 25%	1	-	1000
Chrysene	1.15	10	40-140%	< 25%	2	-	70
Benzo(b)Fluoranthene	2.40	10	40-140%	< 25%	1	-	400
Benzo(k)Fluoranthene	1.66	10	40-140%	< 25%	1	-	100
Benzo(a)Pyrene	1.54	10	40-140%	< 25%	0.2	-	500
Indeno(1,2,3-cd)Pyrene	1.96	10	40-140%	< 25%	0.5	-	100
Dibenzo(a,h)Anthracene	1.74	10	40-140%	< 25%	0.5	-	40
Benzo(g,h,i)perylene	2.04	10	40-140%	< 25%	50	-	20
c9-c18	N/A	100	40-140%	< 25%	700	5000	50000
c19-c369	N/A	100	40-140%	< 25%	14000	-	50000
c11-c22	N/A	100	40-140%	< 25%	200	50000	5000

Surrogates	**% Recovery**
1-Chloro-Octadecane	40-140%
2-Fluorobiphenyl	40-140%
2-Bromonaphthalene	40-140%
o-Terphenyl	40-140%

EPH/PAH-SIM - Soil							
Analytes	MDL mg/Kg	RL mg/Kg	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
2-Methyl-Naphthalene	0.00827	0.027	40-140%	< 25%	0.7	80	300
Acenaphthene	0.00791	0.027	40-140%	< 25%	4	1000	1000
Acenphthalene	0.00815	0.027	40-140%	< 25%	1	600	10
Anthracene	0.00753	0.027	40-140%	< 25%	1000	1000	1000
Benzo(a)Anthracene	0.00627	0.027	40-140%	< 25%	7	7	7
Benzo(a)Pyrene	0.00669	0.027	40-140%	< 25%	2	2	2
Benzo(b)Fluoranthene	0.00767	0.027	40-140%	< 25%	7	7	7
Benzo(g,h,i)perylene	0.00864	0.027	40-140%	< 25%	1000	1000	1000
Benzo(k)Fluoranthene	0.00724	0.027	40-140%	< 25%	70	70	70
Chrysene	0.00853	0.027	40-140%	< 25%	70	70	70
Dibenzo(a,h)Anthracene	0.00838	0.027	40-140%	< 25%	0.7	0.7	0.7
Fluoranthene	0.00791	0.027	40-140%	< 25%	1000	1000	1000
Fluorene	0.00859	0.027	40-140%	< 25%	1000	1000	1000
Indeno(1,2,3-cd)Pyrene	0.00808	0.027	40-140%	< 25%	7	7	7
Naphthalene	0.00747	0.027	40-140%	< 25%	4	40	500
Phenanthrene	0.00767	0.027	40-140%	< 25%	10	500	500
Pyrene	0.00832	0.027	40-140%	< 25%	1000	1000	1000

Surrogates	% Recovery
o-Terphenyl	40-140%

EPH/PAH SIM - Liquid							
Analytes	MDL ug/L	RL ug/L	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 GW-1	MCP METHOD 1 GW-2	MCP METHOD 1 GW-3
2-Methyl-Naphthalene	0.108	0.4	40-140%	< 25%	10	2000	20000
Acenaphthene	0.125	0.4	40-140%	< 25%	20	-	6000
Acenphthalene	0.124	0.4	40-140%	< 25%	30	10000	40
Anthracene	0.116	0.4	40-140%	< 25%	60	-	30
Benzo(a)Anthracene	0.113	0.4	40-140%	< 25%	1	-	1000
Benzo(a)Pyrene	0.129	0.4	40-140%	< 25%	0.2	-	500
Benzo(b)Fluoranthene	0.115	0.4	40-140%	< 25%	1	-	400
Benzo(g,h,i)perylene	0.138	0.4	40-140%	< 25%	50	-	20
Benzo(k)Fluoranthene	0.120	0.4	40-140%	< 25%	1	-	100
Chrysene	0.131	0.4	40-140%	< 25%	2	-	70
Dibenzo(a,h)Anthracene	0.118	0.4	40-140%	< 25%	0.5	-	40
Fluoranthene	0.120	0.4	40-140%	< 25%	90	-	200
Fluorene	0.122	0.4	40-140%	< 25%	30	-	40
Indeno(1,2,3-cd)Pyrene	0.121	0.4	40-140%	< 25%	0.5	-	100
Naphthalene	0.134	0.4	40-140%	< 25%	140	1000	20000
Phenanthrene	0.125	0.4	40-140%	< 25%	40	-	10000
Pyrene	0.121	0.4	40-140%	< 25%	80	-	20

Surrogates	% Recovery
o-Terphenyl	40-140%

VPH - Soil							
Analytes	**MDL mg/Kg**	**RL mg/Kg**	**LCS/MS % Rec / RPD**	**MS/MSD %Rec/RPD**	**MCP METHOD 1 S-1/GW-1**	**MCP METHOD 1 S-1/GW-2**	**MCP METHOD 1 S-1/GW-3**
Methyl tert butyl ether	0.0173	0.05	70-130 % /< 25%	70-130 % /< 50%	0.1	100	100
Benzene	0.0109	0.1	70-130 % /< 25%	70-130 % /< 50%	2	30	30
Toluene	0.00747	0.1	70-130 % /< 25%	70-130 % /< 50%	30	500	500
Ethylbenzene	0.0116	0.1	70-130 % /< 25%	70-130 % /< 50%	40	500	500
p/m-Xylene	0.0223	0.1	70-130 % /< 25%	70-130 % /< 50%	400	300	500
o-Xylene	0.00920	0.1	70-130 % /< 25%	70-130 % /< 50%	400	300	500
1,2,4-Trimethylbenzene	0.0210	0.1	70-130 % /< 25%	70-130 % /< 50%	-	-	-
Naphthalene	0.0189	0.5	70-130 % /< 25%	70-130 % /< 50%	4	40	500
C9-C10 Aromatics	N/A	2.5	70-130 % /< 25%	70-130 % /< 50%	100	100	100
C5-C8 Aliphatics	N/A	2.5	70-130 % /< 25%	70-130 % /< 50%	100	100	100
C9-C12 Aliphatics	N/A	2.5	70-130 % /< 25%	70-130 % /< 50%	1000	1000	1000

Surrogates	**% Recovery**
2,5-Dibromotoluene	70-130%

VPH - Liquid							
Analytes	**MDL ug/L**	**RL ug/L**	**LCS/MS % Rec / RPD**	**MS/MSD %Rec/RPD**	**MCP METHOD 1 GW-1**	**MCP METHOD 1 GW-2**	**MCP METHOD 1 GW-3**
Methyl tert butyl ether	0.280	3	70-130 % /< 25%	70-130 % /< 50%	70	50000	50000
Benzene	0.214	2	70-130 % /< 25%	70-130 % /< 50%	5	2000	10000
Toluene	0.15	2	70-130 % /< 25%	70-130 % /< 50%	1000	50000	40000
Ethylbenzene	0.232	2	70-130 % /< 25%	70-130 % /< 50%	700	20000	5000
p/m-Xylene	0.445	2	70-130 % /< 25%	70-130 % /< 50%	10000	9000	5000
o-Xylene	0.279	2	70-130 % /< 25%	70-130 % /< 50%	10000	9000	5000
1,2,4-Trimethylbenzene	0.226	2	70-130 % /< 25%	70-130 % /< 50%	-	-	-
Naphthalene	0.377	10	70-130 % /< 25%	70-130 % /< 50%	140	1000	20000
C9-C10 Aromatics	N/A	50	70-130 % /< 25%	70-130 % /< 50%	200	7000	50000
C5-C8 Aliphatics	N/A	50	70-130 % /< 25%	70-130 % /< 50%	300	3000	50000
C9-C12 Aliphatics	N/A	50	70-130 % /< 25%	70-130 % /< 50%	700	5000	50000

Surrogates	**% Recovery**
2,5-Dibromotoluene	70-130%

VOCs in Soil - Low EPA 8260B							
Analytes	MDL mg/Kg	RL mg/Kg	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
Acetone	3.23E-03	0.01		< 30%	6	50	400
Acrylonitrile	3.76E-04	0.01		< 30%	-	-	-
Benzene	1.29E-04	0.001	66-142%	< 30%	2	30	30
Bromobenzene	2.01E-04	0.005		< 30%	-	-	-
Bromochloromethane	3.02E-04	0.005		< 30%	-	-	-
Bromodichloromethane	2.29E-04	0.001		< 30%	0.1	0.1	20
Bromoform	4.15E-04	0.004		< 30%	0.1	1	200
Bromomethane	6.48E-04	0.002		< 30%	0.5	0.5	30
Carbon disulfide	1.49E-04	0.01		< 30%	-	-	-
Carbon tetrachloride	1.90E-04	0.001		< 30%	10	5	10
Chlorobenzene	3.48E-04	0.001	60-133%	< 30%	1	3	100
Chlorodibromomethane	3.08E-04	0.001		< 30%	-	-	-
Chloroethane	4.38E-04	0.002		< 30%	-	-	-
Chloroform	3.70E-04	0.0015		< 30%	0.4	0.3	400
Chloromethane	7.83E-04	0.005		< 30%	-	-	-
cis-1,2-Dichloroethene	2.56E-04	0.001		< 30%	0.3	0.4	100
cis-1,3-Dichloropropene	2.67E-04	0.001		< 30%	0.01	0.4	9
Dibromomethane	4.35E-04	0.01		< 30%	-	-	-
Dichlorodifluoromethane	3.17E-04	0.01		< 30%	-	-	-
Ethyl benzene	1.50E-04	0.001		< 30%	40	500	500
ethyl ether	3.80E-04	0.005		< 30%	-	-	-
Ethyl-methacrylate	6.39E-04	0.001		< 30%	-	-	-
Hexachlorobutadiene	4.22E-04	0.005		< 30%	6	6	6
Isopropylbenzene	1.68E-04	0.001		< 30%	-	-	-
Methylene chloride	8.16E-04	0.002		< 30%	0.1	20	200
Methyl-tert-butyl ether	4.87E-04	0.01		< 30%	0.1	100	100
Naphthalene	7.70E-04	0.005		< 30%	4	40	500
n-Butylbenzene	1.98E-04	0.001		< 30%	-	-	-
n-Propylbenzene	1.88E-04	0.001		< 30%	-	-	-
o-Xylene	2.71E-04	0.002		< 30%	400	300	500
p/m-Xylene	3.23E-04	0.002		< 30%	400	300	500
p-Isopropyltoluene	1.91E-04	0.001		< 30%	-	-	-
sec-Butylbenzene	2.06E-04	0.001		< 30%	-	-	-
Styrene	5.52E-04	0.002		< 30%	3	4	30
tert-Butylbenzene	5.61E-04	0.005		< 30%	-	-	-
Tetrachloroethene	1.60E-04	0.001		< 30%	1	10	30
Tetrahydrofuran	3.40E-04	0.02		< 30%	-	-	-
Toluene	1.75E-04	0.0015	59-139%	< 30%	30	500	500
trans-1,2-Dichloroethene	1.78E-04	0.0015		< 30%	1	1	500
trans-1,3-Dichloropropene	1.43E-04	0.001		< 30%	0.01	0.4	9
trans-1,4-Dichloro-2-butene	1.48E-03	0.005		< 30%	-	-	-
Trichloroethene	1.87E-04	0.001	62-137%	< 30%	0.3	2	90
Trichlorofluoromethane	2.31E-04	0.005		< 30%	-	-	-
Vinyl Acetate	8.85E-04	0.01		< 30%	-	-	-
Vinyl chloride	3.61E-04	0.002		< 30%	0.6	0.6	0.6
1,1-Dichloroethane	2.06E-04	0.01		< 30%	0.4	5	500
1,1-Dichloroethene	1.78E-04	0.001	59-172%	< 30%	3	40	500
1,1-Dichloropropene	4.56E-04	0.005		< 30%	-	-	-
1,1,1-Trichloroethane	1.93E-04	0.001		< 30%	30	500	500
1,1,2-Trichloroethane	2.48E-04	0.0015		< 30%	0.1	2	4
1,1,1,2-Tetrachloroethane	3.18E-04	0.001		< 30%	0.1	0.1	7
1,1,2,2-Tetrachloroethane	2.40E-04	0.001		< 30%	0.005	0.02	0.8
1,2-Dibromo-3-chloropropane	8.37E-04	0.005		< 30%	-	-	-
1,2-Dibromoethane	2.11E-04	0.004		< 30%	0.1	0.1	0.7
1,2-Dichlorobenzene	3.64E-04	0.005		< 30%	9	30	300
1,2-Dichloroethane	2.07E-04	0.001		< 30%	0.1	0.1	10
1,2-Dichloropropane	2.33E-04	0.0035		< 30%	0.1	0.1	10
1,2,3-Trichlorobenzene	4.03E-04	0.005		< 30%	-	-	-
1,2,3-Trichloropropane	3.87E-04	0.01		< 30%	-	-	-
1,2,4-Trichlorobenzene	7.90E-04	0.005		< 30%	2	70	500
1,2,4-Trimethylbenzene	5.73E-04	0.005		< 30%	-	-	-
1,3-Dichlorobenzene	2.25E-04	0.005		< 30%	1	40	100
1,3-Dichloropropane	1.73E-04	0.005		< 30%	-	-	-
1,3,5-Trimethylbenzene	1.64E-04	0.005		< 30%	-	-	-
1,4-Dichlorobenzene	3.01E-04	0.005		< 30%	0.7	4	50
1,4-Dichloro-2-butane	1.20E-04	0.01		< 30%	-	-	-
2-Butanone	5.00E-04	0.01		< 30%	4	50	400
2-Chlorotoluene	3.13E-04	0.005		< 30%	-	-	-
2,2-Dichloropropene	7.67E-04	0.005		< 30%	-	-	-
4-Chlorotoluene	2.08E-04	0.005		< 30%	-	-	-
4-methyl-2-pentanone	4.54E-04	0.01		< 30%	0.4	50	400

Non-Standard Compounds							
1,2,4,5-tetramethylbenzene	9.05E-04	0.001		< 30%	-	-	-
1,4-Dioxane	1.74E-02	0.1		< 30%	0.2	6	70
2-Chloroethylvinyl ether	6.16E-04	0.005		< 30%	-	-	-
2-Hexanone	3.96E-04	0.01		< 30%	-	-	-
4-ethyltoluene	4.85E-04	0.001		< 30%	-	-	-
Acrolein	3.01E-03	0.025		< 30%	-	-	-
cyclohexane	6.25E-04	0.005		< 30%	-	-	-
Diisopropyl ether	1.49E-04	0.004		< 30%	-	-	-
Ethyl Acetate	1.28E-04	0.001		< 30%	-	-	-
Ethyl-tert-butyl ether	4.23E-04	0.004		< 30%	-	-	-
Freon-113	2.15E-04	0.02		< 30%	-	-	-
Halothane	1.50E-04	0.005		< 30%	-	-	-
Iodomethane	1.27E-03	0.01		< 30%	-	-	-
Methyl acetate	4.66E-04	0.01		< 30%	-	-	-
methyl cyclohexane	6.99E-04	0.0035		< 30%	-	-	-
p-diethylbenzene	1.00E-03	0.001		< 30%	-	-	-
Tert-Butyl Alcohol	6.42E-04	0.06		< 30%	-	-	-
Tertiary-amyl methyl ether	5.76E-04	0.004		< 30%	-	-	-

Surrogates	% Recovery
dibromofluoromethane	70-130%
1,2-dichloroethane-d4	70-130%
toluene-d8	70-130%
4-bromofluorobenzene	70-130%

VOCs in Soil - High EPA 8260B							
Analytes	MDL* ug/Kg	RL* ug/Kg	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
Acetone	1.62E-01	0.5		< 30%	6	50	400
Acrylonitrile	6.01E-02	0.2		< 30%	-	-	-
Benzene	9.62E-03	0.05	66-142%	< 30%	2	30	30
Bromobenzene	1.66E-02	0.25		< 30%	-	-	-
Bromochloromethane	1.79E-02	0.25		< 30%	-	-	-
Bromodichloromethane	1.92E-02	0.05		< 30%	0.1	0.1	20
Bromoform	5.58E-02	0.2		< 30%	0.1	1	200
Bromomethane	2.91E-02	0.1		< 30%	0.5	0.5	30
Carbon disulfide	1.28E-02	0.5		< 30%	-	-	-
Carbon tetrachloride	1.39E-02	0.05		< 30%	10	5	10
Chlorobenzene	1.23E-02	0.05	60-133%	< 30%	1	3	100
Chlorodibromomethane	1.60E-02	0.05		< 30%	-	-	-
Chloroethane	2.20E-02	0.1		< 30%	-	-	-
Chloroform	1.62E-02	0.075		< 30%	0.4	0.3	400
Chloromethane	3.92E-02	0.25		< 30%	-	-	-
cis-1,2-Dichloroethene	1.28E-02	0.05		< 30%	0.3	0.4	100
cis-1,3-Dichloropropene	1.34E-02	0.05		< 30%	0.01	0.4	9
Dibromomethane	2.17E-02	0.5		< 30%	-	-	-
Dichlorodifluoromethane	8.66E-02	0.5		< 30%	-	-	-
Ethyl benzene	1.90E-02	0.05		< 30%	40	500	500
Ethyl ether	1.80E-02	0.25		< 30%	-	-	-
Ethyl methacrylate	7.36E-02	0.5		< 30%	-	-	-
Hexachlorobutadiene	2.11E-02	0.25		< 30%	6	6	6
Isopropylbenzene	9.66E-03	0.05		< 30%	-	-	-
Methylene chloride	2.28E-02	0.5		< 30%	0.1	20	200
Methyl-tert-butyl ether	5.71E-02	0.1		< 30%	0.1	100	100
Naphthalene	3.30E-02	0.25		< 30%	4	40	500
n-Butylbenzene	4.11E-02	0.05		< 30%	-	-	-
n-Propylbenzene	9.99E-03	0.05		< 30%	-	-	-
o-Xylene	1.17E-02	0.1		< 30%	400	300	500
p/m-Xylene	2.85E-02	0.1		< 30%	400	300	500
p-Isopropyltoluene	9.75E-03	0.05		< 30%	-	-	-
sec-Butylbenzene	1.06E-02	0.05		< 30%	-	-	-
Styrene	3.07E-02	0.1		< 30%	3	4	30
tert-Butylbenzene	2.80E-02	0.25		< 30%	-	-	-
Tetrachloroethene	1.45E-02	0.05		< 30%	1	10	30
Tetrahydrofuran	5.64E-02	1		< 30%	-	-	-
Toluene	9.49E-03	0.075	59-139%	< 30%	30	500	500

trans-1,2-Dichloroethene	1.50E-02	0.075		< 30%	1	1	500
trans-1,3-Dichloropropene	1.68E-02	0.05		< 30%	0.01	0.4	9
trans-1,4-Dichloro-2-butene	7.39E-02	0.25		< 30%	-	-	-
Trichloroethene	1.41E-02	0.05	62-137%	< 30%	0.3	2	90
Trichlorofluoromethane	2.18E-02	0.25		< 30%	-	-	-
Vinyl acetate	6.83E-02	0.5		< 30%	-	-	-
Vinyl chloride	2.77E-02	0.1		< 30%	0.6	0.6	0.6
1,1-Dichloroethane	1.18E-02	0.075		< 30%	0.4	5	500
1,1-Dichloroethene	1.66E-02	0.05	59-172%	< 30%	3	40	500
1,1-Dichloropropene	2.28E-02	0.25		< 30%	-	-	-
1,1,1-Trichloroethane	1.02E-02	0.05		< 30%	30	500	500
1,1,2-Trichloroethane	2.05E-02	0.075		< 30%	0.1	2	4
1,1,1,2-Tetrachloroethane	1.64E-02	0.05		< 30%	0.1	0.1	7
1,1,2,2-Tetrachloroethane	1.45E-02	0.05		< 30%	0.005	0.02	0.8
1,2-Dibromo-3-chloropropane	7.41E-02	0.25		< 30%	-	-	-
1,2-Dibromoethane	1.07E-02	0.2		< 30%	0.1	0.1	0.7
1,2-Dichlorobenzene	1.82E-02	0.25		< 30%	9	30	300
1,2-Dichloroethane	1.47E-02	0.05		< 30%	0.1	0.1	10
1,2-Dichloropropane	1.26E-02	0.18		< 30%	0.1	0.1	10
1,2,3-Trichlorobenzene	4.62E-02	0.25		< 30%	-	-	-
1,2,3-Trichloropropane	2.09E-02	0.5		< 30%	-	-	-
1,2,4-Trichlorobenzene	4.35E-02	0.25		< 30%	2	70	500
1,2,4-Trimethylbenzene	7.63E-02	0.25		< 30%	-	-	-
1,3-Dichlorobenzene	1.88E-02	0.25		< 30%	1	40	100
1,3-Dichloropropane	1.17E-02	0.25		< 30%	-	-	-
1,3,5-Trimethylbenzene	6.86E-02	0.25		< 30%	-	-	-
1,4-Dichlorobenzene	1.53E-02	0.25		< 30%	0.7	4	50
1,4-Dichlorobutane	3.92E-02	0.5		< 30%	-	-	-
2-Butanone	1.94E-01	0.5		< 30%	4	50	400
2-Chlorotoluene	1.56E-02	0.25		< 30%	-	-	-
2,2-Dichloropropane	6.06E-02	0.25		< 30%	-	-	-
4-Chlorotoluene	1.42E-02	0.25		< 30%	-	-	-
4-Methyl-2-pentanone	8.84E-02	0.5		< 30%	0.4	50	400
2-Hexanone	6.30E-02	0.5		< 30%	-	-	-
Non-Standard Compounds							
1,4-Dioxane	8.70E-01	5		< 30%	0.2	6	70
2-Chloroethylvinyl ether	1.56E-02	1		< 30%	-	-	-
4-ethyltoluene	2.43E-02	0.05		< 30%	-	-	-
Acrolein	1.50E-01	1.2		< 30%	-	-	-
Diisopropyl ether	4.77E-02	0.2		< 30%	-	-	-
Ethyl-Tert-Butyl-Ether	4.38E-02	0.2		< 30%	-	-	-
Freon-113	4.66E-02	0.2		< 30%	-	-	-
Iodomethane	6.33E-02	0.5		< 30%	-	-	-
Tert-Butyl Alcohol	6.25E-02	0.5		< 30%	-	-	-
Tertiary-Amyl Methyl Ether	5.05E-02	0.2		< 30%	-	-	-

Surrogates	**% Recovery**
dibromofluoromethane	70-130%
1,2-dichloroethane-d4	70-130%
toluene-d8	70-130%
4-bromofluorobenzene	70-130%
Surrogates	**% Recovery**
dibromofluoromethane	70-130%
1,2-dichloroethane-d4	70-130%
toluene-d8	70-130%
4-bromofluorobenzene	70-130%

* Multiplier for Medium/High-Level VOC MDLs and RLs is 50x Low-Level MDLs and RLs

SVOCs in soil EPA 8270C							
Analytes	MDL mg/Kg	RL mg/Kg	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
1,2,4,5-Tetrachlorobenzene	0.110	0.333	40-140%	< 50%	-	-	-
1,2,4-Trichlorobenzene	0.099	0.333	38-107%	< 50%	2	70	500
1,2-Dichlorobenzene	0.077	0.333	40-140%	< 50%	9	30	300
1,3-Dichlorobenzene	0.104	0.333	40-140%	< 50%	1	40	100
1,4-Dichlorobenzene	0.068	0.333	28-104%	< 50%	0.7	4	50
1-Methylnaphthalene	0.124	0.333	40-140%	< 50%	-	-	-
2,4,5-Trichlorophenol	0.092	0.333	30-130%	< 50%	-	-	-
2,4,6-Trichlorophenol	0.104	0.333	30-130%	< 50%	-	-	-
2,4-Dichlorophenol	0.237	0.67	30-130%	< 50%	-	-	-
2,4-Dimethylphenol	0.190	0.333	30-130%	< 50%	-	-	-
2,4-Dinitrophenol	1.240	3	4-130%	< 50%	-	-	-
2,4-Dinitrotoluene	0.105	0.333	28-89%	< 50%	-	-	-
2,6-Dinitrotoluene	0.117	0.333	40-140%	< 50%	-	-	-
2-Chloronaphthalene	0.105	0.4	40-140%	< 50%	-	-	-
2-Chlorophenol	0.118	0.4	25-102%	< 50%	-	-	-
2-Methylnaphthalene	0.113	0.333	40-140%	< 50%	0.7	80	300
2-Methylphenol	0.287	0.4	30-130%	< 50%	-	-	-
2-Nitroaniline	0.075	0.333	40-140%	< 50%	-	-	-
2-Nitrophenol	0.129	1.3	30-130%	< 50%	-	-	-
3,3'-Dichlorobenzidine	0.126	0.67	30-140%	< 50%	-	-	-
3-Methylphenol/4-Methyphen	0.185	0.4	30-130%	< 50%	-	-	-
3-Nitroaniline	0.161	0.333	40-140%	< 50%	-	-	-
4,6-Dinitro-o-cresol	0.149	1.3	30-130%	< 50%	-	-	-
4-Bromophenyl phenyl ether	0.102	0.333	40-140%	< 50%	-	-	-
4-Chloroaniline	0.170	0.333	30-140%	< 50%	-	-	-
4-Chlorophenyl phenyl	0.092	0.333	40-140%	< 50%	-	-	-
4-Nitroaniline	0.116	0.47	40-140%	< 50%	-	-	-
4-Nitrophenol	0.441	0.67	11-114%	< 50%	-	-	-
Acenaphthene	0.103	0.333	31-137%	< 50%	4	1000	1000
Acenaphthylene	0.211	0.333	40-140%	< 50%	1	600	10
Acetophenone	0.105	1.3	40-140%	< 50%	-	-	-
Aniline	0.173	0.67	30-140%	< 50%	-	-	-
Anthracene	0.115	0.333	40-140%	< 50%	1000	1000	1000
Azobenzene	0.114	0.333	40-140%	< 50%	-	-	-
Benzidine	0.543	3.3	30-140%	< 50%	-	-	-
Benzo(a)anthracene	0.070	0.333	40-140%	< 50%	7	7	7
Benzo(a)pyrene	0.087	0.333	40-140%	< 50%	2	2	2
Benzo(b)fluoranthene	0.082	0.333	40-140%	< 50%	7	7	7
Benzo(ghi)perylene	0.144	0.333	40-140%	< 50%	1000	1000	1000
Benzo(k)fluoranthene	0.078	0.333	40-140%	< 50%	70	70	70
Benzoic acid	1.349	3.3	40-140%	< 50%	-	-	-
Benzyl alcohol	0.091	0.67	40-140%	< 50%	-	-	-
Biphenyl	0.095	0.333	40-140%	< 50%	-	-	-
Bis(2-chloroethoxy)methane	0.098	0.333	40-140%	< 50%	-	-	-
Bis(2-chloroethyl)ether	0.103	0.333	40-140%	< 50%	-	-	-
Bis(2-chloroisopropyl)ether	0.107	0.333	40-140%	< 50%	-	-	-
Bis(2-ethylhexyl)phthalate	0.179	0.67	40-140%	< 50%	-	-	-
Butyl benzyl phthalate	0.114	0.333	40-140%	< 50%	-	-	-
Carbazole	0.089	0.333	40-140%	< 50%	-	-	-
Chrysene	0.100	0.333	40-140%	< 50%	70	70	70
Dibenzo(a,h)anthracene	0.116	0.2	40-140%	< 50%	0.7	0.7	0.7
Dibenzofuran	0.100	0.333	40-140%	< 50%	-	-	-
Diethyl phthalate	0.092	0.333	40-140%	< 50%	-	-	-
Dimethyl phthalate	0.099	0.333	40-140%	< 50%	-	-	-
Di-n-butylphthalate	0.117	0.333	40-140%	< 50%	-	-	-
Di-n-octylphthalate	0.072	0.333	40-140%	< 50%	-	-	-
Fluoranthene	0.096	0.333	40-140%	< 50%	1000	1000	1000
Fluorene	0.093	0.333	40-140%	< 50%	1000	1000	1000
Hexachlorobenzene	0.092	0.333	40-140%	< 50%	-	-	-
Hexachlorobutadiene	0.144	0.67	40-140%	< 50%	6	6	6
Hexachlorocyclopentadiene	0.358	0.67	40-140%	< 50%	-	-	-
Hexachloroethane	0.119	0.333	40-140%	< 50%	-	-	-
Indeno(1,2,3-cd)pyrene	0.129	0.333	40-140%	< 50%	7	7	7
Isophorone	0.085	0.333	40-140%	< 50%	-	-	-
Naphthalene	0.102	0.333	40-140%	< 50%	4	40	500
NDPA/DPA	0.233	1	40-140%	< 50%	-	-	-
Nitrobenzene	0.113	0.333	40-140%	< 50%	-	-	-
n-Nitrosodimethylamine	0.104	3.3	30-140%	< 50%	-	-	-
n-Nitrosodi-n-propylamine	0.131	0.333	41-126%	< 50%	-	-	-
p-Chloro-m-cresol	0.059	0.333	26-103%	< 50%	-	-	-
Pentachlorophenol	0.252	1.3	17-109%	< 50%	-	-	-
Phenanthrene	0.097	0.333	40-140%	< 50%	10	500	500

Phenol	0.119	0.47	28-90%	< 50%	-	-	-
Pyrene	0.085	0.333	35-142%	< 50%	1000	1000	1000
Pyridine	0.405	3.3	30-140%	< 50%	-	-	-

Surrogates	% Recovery
2-Fluorophenol	25-120%
Phenol-d6	10-120%
Nitrobenzene-d5	23-120%
2-Fluorobiphenyl	30-120%
2,4,6-Tribromophenol	0-136%
4-Terphenyl-d14	18-120%

SVOCs in liquid EPA 8270C / EPA 625							
Analytes	MDL ug/L	RL ug/L	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 GW-1	MCP METHOD 1 GW-2	MCP METHOD 1 GW-3
1,2,4,5-Tetrachlorobenzene	1.85	20	40-140%	< 30%	-	-	-
1,2,4-Trichlorobenzene	1.92	5	39-98%	< 30%	70	2000	50000
1,2-Dichlorobenzene	1.78	5	40-140%	< 30%	600	2000	2000
1,3-Dichlorobenzene	1.41	5	40-140%	< 30%	40	2000	50000
1,4-Dichlorobenzene	1.55	5	36-97%	< 30%	5	200	8000
2,4,5-Trichlorophenol	1.48	5	30-130%	< 30%	-	-	-
2,4,6-Trichlorophenol	1.63	5	30-130%	< 30%	-	-	-
2,4-Dichlorophenol	1.60	10	30-130%	< 30%	-	-	-
2,4-Dimethylphenol	1.15	10	30-130%	< 30%	-	-	-
2,4-Dinitrophenol	7.77	30	30-130%	< 30%	-	-	-
2,4-Dinitrotoluene	1.64	6	24-96%	< 30%	-	-	-
2,6-Dinitrotoluene	1.54	5	40-140%	< 30%	-	-	-
2-Chloronaphthalene	1.53	6	40-140%	< 30%	-	-	-
2-Chlorophenol	1.59	6	27-123%	< 30%	-	-	-
2-Methylnaphthalene	1.57	5	40-140%	< 30%	10	2000	20000
2-Methylphenol	2.35	6	30-130%	< 30%	-	-	-
2-Nitroaniline	1.61	5		< 30%	-	-	-
2-Nitrophenol	1.74	20	30-130%	< 30%	-	-	-
3,3'-Dichlorobenzidine	4.78	50	40-140%	< 30%	-	-	-
3-Methylphenol/4-Methylpher	2.03	6	30-130%	< 30%	-	-	-
3-Nitroaniline	1.91	5		< 30%	-	-	-
4,6-Dinitro-o-cresol	7.82	20		< 30%	-	-	-
4-Bromophenyl phenyl ether	1.03	5	40-140%	< 30%	-	-	-
4-Chloroaniline	1.64	5	40-140%	< 30%	-	-	-
4-Chlorophenyl phenyl ether	1.21	5	40-140%	< 30%	-	-	-
4-Nitroaniline	2.05	7		< 30%	-	-	-
4-Nitrophenol	1.78	10	10-80%	< 30%	-	-	-
Acenaphthene	1.31	5	46-118%	< 30%	20	-	6000
Acenaphthylene	1.40	5	40-140%	< 30%	30	10000	40
Acetophenone	3.35	20	40-140%	< 30%	-	-	-
Aniline	0.992	20	40-140%	< 30%	-	-	-
Anthracene	1.25	5	40-140%	< 30%	60	-	30
Azobenzene	1.11	5	40-140%	< 30%	-	-	-
Benzidine	11.9	50		< 30%	-	-	-
Benzo(a)anthracene	0.661	5	40-140%	< 30%	1	-	1000
Benzo(a)pyrene	0.869	5	40-140%	< 30%	0.2	-	500
Benzo(b)fluoranthene	0.891	5	40-140%	< 30%	1	-	400
Benzo(ghi)perylene	1.45	5	40-140%	< 30%	50	-	20
Benzo(k)fluoranthene	0.805	5	40-140%	< 30%	1	-	100
Benzoic acid	4.52	50		< 30%	-	-	-
Benzyl Alcohol	2.85	10		< 30%	-	-	-
Biphenyl	1.60	5		< 30%	-	-	-
Bis(2-chloroethoxy)methane	1.67	5	40-140%	< 30%	-	-	-
Bis(2-chloroethyl)ether	1.35	5	40-140%	< 30%	-	-	-
Bis(2-chloroisopropyl)ether	1.64	5	40-140%	< 30%	-	-	-
Bis(2-ethylhexyl)phthalate	0.834	5	40-140%	< 30%	-	-	-
Butyl benzyl phthlate	1.73	5	40-140%	< 30%	-	-	-
Carbazole	1.41	5		< 30%	-	-	-
Chrysene	0.817	5	40-140%	< 30%	2	-	70
Dibenzo(a,h)anthracene	0.886	5	40-140%	< 30%	0.5	-	40
Dibenzofuran	1.39	5	40-140%	< 30%	-	-	-
Diethyl phthalate	0.95	5	40-140%	< 30%	-	-	-
Dimethyl phthalate	1.05	5	40-140%	< 30%	-	-	-
Di-n-butylphthalate	1.05	5	40-140%	< 30%	-	-	-
Di-n-octylphthalate	0.852	5	40-140%	< 30%	-	-	-
Fluoranthene	1.16	5	40-140%	< 30%	90	-	200
Fluorene	1.11	5	40-140%	< 30%	30	-	40
Hexachlorobenzene	1.31	5	40-140%	< 30%	-	-	-
Hexachlorobutadiene	2.09	10	40-140%	< 30%	0.6	1	3000

Hexachlorocyclopentadiene	6.51	30	40-140%	< 30%	-	-	-
Hexachloroethane	1.91	5	40-140%	< 30%	-	-	-
Indeno(1,2,3-cd)pyrene	1.27	7	40-140%	< 30%	0.5	-	100
Isophorone	1.90	5	40-140%	< 30%	-	-	-
Naphthalene	1.49	5	40-140%	< 30%	140	1000	20000
NDPA/DPA	4.54	15		< 30%	-	-	-
Nitrobenzene	1.61	5	40-140%	< 30%	-	-	-
n-Nitrosodimethylamine	1.02	50	40-140%	< 30%	-	-	-
n-Nitrosodi-n-propylamine	1.95	5	40-140%	< 30%	-	-	-
p-Chloro-m-cresol	1.34	5	23-97%	< 30%	-	-	-
Pentachlorophenol	4.91	15	9-103%	< 30%	-	-	-
Phenanthrene	0.868	5	40-140%	< 30%	40	-	10000
Phenol	0.786	7	12-110%	< 30%	-	-	-
Pyrene	1.26	5	26-127%	< 30%	80	-	20
Pyridine	10.0	50		< 30%	-	-	-

Surrogates	**% Recovery**
2-Fluorophenol	21-120%
Phenol-d6	10-120%
Nitrobenzene-d5	23-120%
2-Fluorobiphenyl	15-120%
2,4,6-Tribromophenol	10-120%
4-Terphenyl-d14	33-120%

SVOCs in Soil EPA 8270CSIM							
PAHs - Analytes	MDL mg/Kg	RL mg/Kg	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
Acenaphthene	2.81E-03	0.013	31-137%	< 50%	4	1000	1000
Acenaphthylene	2.94E-03	0.013		< 50%	1	600	10
Anthracene	2.63E-03	0.013	40-140%	< 50%	1000	1000	1000
Benzo (a) anthracene	2.16E-03	0.013		< 50%	7	7	7
Benzo (a) pyrene	3.68E-03	0.013		< 50%	2	2	2
Benzo (b) fluoranthene	2.91E-03	0.013		< 50%	7	7	7
Benzo (ghi) perylene	2.91E-03	0.013		< 50%	1000	1000	1000
Benzo (k) fluoranthene	1.33E-02	0.013		< 50%	70	70	70
Chrysene	3.22E-03	0.013		< 50%	70	70	70
Dibenzo (a,h) anthracene	2.31E-03	0.013		< 50%	0.7	0.7	0.7
Fluoranthene	1.98E-03	0.013	40-140%	< 50%	1000	1000	1000
Fluorene	3.45E-03	0.013		< 50%	1000	1000	1000
Indeno (1,2,3-cd) pyrene	2.87E-03	0.013		< 50%	7	7	7
Naphthalene	3.77E-03	0.013		< 50%	4	40	500
Phenanthrene	2.95E-03	0.013		< 50%	10	500	500
Pyrene	2.81E-03	0.013	35-142%	< 50%	1000	1000	1000
1-Methylnaphthalene	1.99E-03	0.013		< 50%	-	-	-
2-Chloronaphthalene	3.10E-03	0.013	40-140%	< 50%	-	-	-
2-Methylnaphthalene	4.09E-03	0.013		< 50%	0.7	80	300
Additional - Analytes							
Hexachlorobutadiene	2.81E-03	0.033		< 50%	6	6	6
Pentachlorophenol	5.33E-02	0.053	17-109%	< 50%	-	-	-
Hexachlorobenzene	2.78E-03	0.053		< 50%	-	-	-
Hexachloroethane	3.00E-03	0.053		< 50%	-	-	-

Surrogates	% Recovery
2-Fluorophenol	25-120%
Phenol-d6	10-120%
Nitrobenzene-d5	23-120%
2-Fluorobiphenyl	30-120%
2,4,6-Tribromophenol	19-120%
4-Terphenyl-d14	18-120%

SVOCs in Liquid EPA 8270CSIM							
PAHs - Analytes	MDL ug/L	RL ug/L	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 GW-1	MCP METHOD 1 GW-2	MCP METHOD 1 GW-3
Acenaphthene	0.064	0.2	37-111%	< 40%	20	-	6000
Acenaphthylene	0.05	0.2		< 40%	30	10000	40
Anthracene	0.063	0.2	40-140%	< 40%	60	-	30
Benzo (a) anthracene	0.057	0.2		< 40%	1	-	1000
Benzo (a) pyrene	0.069	0.2		< 40%	0.2	-	500
Benzo (b) fluoranthene	0.071	0.2		< 40%	1	-	400
Benzo (ghi) perylene	0.07	0.2		< 40%	50	-	20
Benzo (k) fluoranthene	0.068	0.2		< 40%	1	-	100
Chrysene	0.049	0.2		< 40%	2	-	70
Dibenzo (a,h) anthracene	0.073	0.2		< 40%	0.5	-	40
Fluoranthene	0.043	0.2	40-140%	< 40%	90	-	200
Fluorene	0.057	0.2		< 40%	30	-	40
Indeno (1,2,3-cd) pyrene	0.079	0.2		< 40%	0.5	-	100
Naphthalene	0.064	0.2		< 40%	140	1000	20000
Phenanthrene	0.064	0.2		< 40%	40	-	10000
Pyrene	0.057	0.2	26-127%	< 40%	80	-	20
1-Methylnaphthalene	0.056	0.2		< 40%	-	-	-
2-Chloronaphthalene	0.066	0.2	40-140%	< 40%	-	-	-
2-Methylnaphthalene	0.06	0.2		< 40%	10	2000	20000
Additional - Analytes							
Hexachlorobutadiene	0.071	0.5		< 40%	0.6	1	3000
Pentachlorophenol	0.187	0.8	9-103%	< 40%	-	-	-
Hexachlorobenzene	0.0139	0.8		< 40%	-	-	-
Hexachloroethane	0.065	0.8		< 40%	-	-	-

Surrogates	% Recovery
2-Fluorophenol	21-120%
Phenol-d6	10-120%
Nitrobenzene-d5	23-120%
2-Fluorobiphenyl	15-120%
2,4,6-Tribromophenol	10-120%
4-Terphenyl-d14	33-120%

PCBs in soil EPA 8082							
Analytes	**MDL mg/Kg**	**RL mg/Kg**	**LCS/MS % Rec**	**MS/MSD % RPD**	**MCP METHOD 1 S-1/GW-1**	**MCP METHOD 1 S-1/GW-2**	**MCP METHOD 1 S-1/GW-3**
Aroclor 1016	6.58E-03	0.0333	40-140%	< 50%	2	2	2
Aroclor 1221	1.00E-02	0.0333		< 50%	2	2	2
Aroclor 1232	7.07E-03	0.0333		< 50%	2	2	2
Aroclor 1242	6.32E-03	0.0333		< 50%	2	2	2
Aroclor 1248	4.03E-03	0.0333		< 50%	2	2	2
Aroclor 1254	5.25E-03	0.0333		< 50%	2	2	2
Aroclor 1260	5.78E-03	0.0333	40-140%	< 50%	2	2	2
Aroclor 1262	2.46E-03	0.0333		< 50%	2	2	2
Aroclor 1268	4.83E-03	0.0333		< 50%	2	2	2

Surrogate(s)	% Recovery
2,4,5,6-Tetrachloro-m-xylene	30-150%
Decachlorobiphenyl	30-150%

PCB's in Liquid EPA 8082							
Analytes	**MDL ug/L**	**RL ug/L**	**LCS/MS % Rec**	**MS/MSD % RPD**	**MCP METHOD 1 GW-1**	**MCP METHOD 1 GW-2**	**MCP METHOD 1 GW-3**
Aroclor 1016	0.0660	0.25	40-140%	< 30%	0.5	5	10
Aroclor 1221	0.0580	0.25		< 30%	0.5	5	10
Aroclor 1232	0.0370	0.25		< 30%	0.5	5	10
Aroclor 1242	0.0720	0.25		< 30%	0.5	5	10
Aroclor 1248	0.0670	0.25		< 30%	0.5	5	10
Aroclor 1254	0.0410	0.25		< 30%	0.5	5	10
Aroclor 1260	0.0380	0.25	40-140%	< 30%	0.5	5	10
Aroclor 1262	0.0350	0.25		< 30%	0.5	5	10
Aroclor 1268	0.0290	0.25		< 30%	0.5	5	10

Surrogate(s)	% Recovery
2,4,5,6-Tetrachloro-m-xylene	30-150%
Decachlorobiphenyl	30-150%

Trace Metals Soil - EPA 6010B, 7471A							
Element	MDL mg/Kg	RL mg/Kg	LCS/MS % Rec	MSD RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
Aluminum	0.891	4.0	75-125%	< 35%	-	-	-
Antimony	0.383	2.0	75-125%	< 35%	20	20	20
Arsenic	0.0768	0.4	75-125%	< 35%	20	20	20
Barium	0.0338	0.4	75-125%	< 35%	1000	1000	1000
Beryllium	0.0140	0.2	75-125%	< 35%	100	100	100
Boron	0.326	0.8	75-125%	< 35%	-	-	-
Cadmium	0.0254	0.2	75-125%	< 35%	2	2	2
Calcium	0.916	4.0	75-125%	< 35%	-	-	-
Chromium	0.0812	0.4	75-125%	< 35%	30	30	30
Cobalt	0.0859	0.8	75-125%	< 35%	-	-	-
Copper	0.186	0.4	75-125%	< 35%	-	-	-
Iron	0.692	2.0	75-125%	< 35%	-	-	-
Lead	0.112	2	75-125%	< 35%	300	300	300
Magnesium	1.798	4.0	75-125%	< 35%	-	-	-
Manganese	0.0405	0.4	75-125%	< 35%	-	-	-
Mercury	0.0176	0.08	80-120%	< 20%	20	20	20
Molybdenum	0.174	2.0	75-125%	< 35%	-	-	-
Nickel	0.111	1.0	75-125%	< 35%	20	20	20
Potassium	31.9	100	75-125%	< 35%	-	-	-
Selenium	0.131	0.8	75-125%	< 35%	400	400	400
Silicon	5.57	20	75-125%	< 35%	-	-	-
Silver	0.0656	0.28	75-125%	< 35%	100	100	100
Sodium	31.8	80	75-125%	< 35%	-	-	-
Strontium	0.0614	0.4	75-125%	< 35%	-	-	-
Thallium	0.249	0.8	75-125%	< 35%	8	8	8
Tin	0.177	2.0	75-125%	< 35%	-	-	-
Titanium	0.0757	0.4	75-125%	< 35%	-	-	-
Vanadium	0.0892	0.4	75-125%	< 35%	600	600	600
Zinc	0.216	2.0	75-125%	< 35%	2500	2500	2500

Trace Metals Liquid - EPA 6010B, 7470A							
Element	MDL ug/L	RL ug/L	LCS % Rec	MS/MSD %Rec/RPD	MCP METHOD 1 GW-1	MCP METHOD 1 GW-2	MCP METHOD 1 GW-3
Aluminum	22.277	100	80-120%	75-125%/ <20%	-	-	-
Antimony	9.563	50	80-120%	75-125%/ <20%	6	-	8000
Arsenic	1.920	5	80-120%	75-125%/ <20%	10	-	900
Barium	0.845	10	80-120%	75-125%/ <20%	2000	-	50000
Beryllium	0.350	5	80-120%	75-125%/ <20%	4	-	200
Boron	8.154	20	80-120%	75-125%/ <20%	-	-	-
Cadmium	0.635	5	80-120%	75-125%/ <20%	5	-	4
Calcium	22.890	100	80-120%	75-125%/ <20%	-	-	-
Chromium	2.030	10	80-120%	75-125%/ <20%	100	-	300
Cobalt	2.147	20	80-120%	75-125%/ <20%	-	-	-
Copper	4.642	10	80-120%	75-125%/ <20%	-	-	-
Iron	17.300	50	80-120%	75-125%/ <20%	-	-	-
Lead	2.802	10	80-120%	75-125%/ <20%	15	-	10
Magnesium	44.941	100	80-120%	75-125%/ <20%	-	-	-
Manganese	1.013	10	80-120%	75-125%/ <20%	-	-	-
Mercury	0.069	0.2	80-120%	70-130% / < 20%	2	-	20
Molybdenum	4.343	50	80-120%	75-125%/ <20%	-	-	-
Nickel	2.787	25	80-120%	75-125%/ <20%	100	-	200
Potassium	798.578	2500	80-120%	75-125%/ <20%	-	-	-
Selenium	3.277	10	80-120%	75-125%/ <20%	50	-	100
Silicon	139.321	500	80-120%	75-125%/ <20%	-	-	-
Silver	1.640	7	80-120%	75-125%/ <20%	100	-	7
Sodium	795.200	2000	80-120%	75-125%/ <20%	-	-	-
Strontium	1.536	10	80-120%	75-125%/ <20%	-	-	-
Thallium	6.234	20	80-120%	75-125%/ <20%	2	-	3000
Tin	4.431	50	80-120%	75-125%/ <20%	-	-	-
Titanium	1.891	10	80-120%	75-125%/ <20%	-	-	-
Vanadium	2.229	10	80-120%	75-125%/ <20%	30	-	4000
Zinc	5.409	50	80-120%	75-125%/ <20%			

APPENDIX C

QAPP PROJECT PERSONNEL LOG SHEET

QAPP PROJECT PERSONNEL LOG SHEET

By signing this QAPP Project Personnel Log Sheet, you are verifying that you have read the attached QAPP and agree to follow the procedures described therein.

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

APPENDIX C

NOVER-ARMSTRONG ASSOCIATES, INC.

124 Main Street, Unit 2GG
Carver, Massachusetts 02330
Telephone 508.866.8383
Facsimile 508.866.9898

SDO-certified DBE & WBE
www.noverarmstrong.com

August 8, 2012

Richard K. Quateman, LSP, CHMM
Principal Scientist
Kleinfelder ▪ S E A Consultants
215 First Street
Cambridge, MA 02142

RE: Supplemental Building Materials Survey
MBTA Tire Maintenance Facility
21 Water Street
Cambridge, Massachusetts
NAA File P2814
K/SEA Reference No. 2011035.01-A

Dear Mr. Quateman,

Nover-Armstrong Associates, Inc. (Nover-Armstrong) has completed a Supplemental Building Materials Survey of the MBTA Tire Maintenance Facility located at 21 Water Street in Cambridge, Massachusetts (the site). Please refer to Figure 1 – USGS Topographic Quadrangle, which identifies the site location.

The MBTA Tire Maintenance Facility consists of approximately 11,914 square feet. Nover-Armstrong understands the Facility is scheduled for future demolition as part of the MBTA's Green Line Extension (GLX) project. Our survey findings are presented below.

1.0 Summary of Initial Hazardous Materials Survey (November 2011)

As part of the Initial Hazardous Materials Survey completed by Nover-Armstrong in the Fall of 2011, Lead Based Paint (LBP), Asbestos Containing Materials (ACMs), and Polychlorinated Biphenyls (PCBs) surveys were completed.

During the PCB survey portion of the initial hazardous materials survey completed in November 2011, visual inspection revealed mortar, floor caulking, and painted caulking that were considered potential PCB sources. These building materials were observed to be in poor to good condition, with areas of isolated damage.

A total of four floor caulking samples, three window caulking samples, one painted wall caulking, two mortar, and one painted mortar samples were collected as part of this assessment. The building material samples were submitted to Alpha Analytical Laboratories, Inc. (Alpha) and analyzed for PCBs via EPA Method 3540C (Soxhlet Extraction Method).

The attached Table 1 – Summary of 11.2011 Building Materials Analytical Results (for PCBs) summarizes the analytical findings of the initial survey. Concentrations of PCBs were detected in all window caulking samples and one wall caulking sample. PCB concentrations ranged from 110,000 parts per million (ppm) to 993,000 ppm. Lower PCB concentrations ranging from 0.172 ppm to 40.4 ppm were detected in the floor caulking and mortar associated with concrete walls. Review of the analytical laboratory report revealed that 16 ppm PCBs was also detected in the Method Blank sample. Nover-Armstrong contacted Glenn Breland of Alpha relative to the detection of PCBs in the Method Blank. Mr. Breland stated that the Method Blank was run as part of the sample batch. During the Soxhlet extraction and / or blow down process, the Method Blank (and potentially some of the building material samples) was contaminated from the window caulking samples containing very high PCB concentrations run at the beginning of the batch. Therefore, samples containing less than 16 ppm PCBs, including FLOOR-1, FLOOR-3, FLOOR-4, WALL-1, and WALL-4, may not contain PCBs or may have concentrations less than the concentrations reported by Alpha in their laboratory report.

Based upon the data obtained during this Initial Hazardous Materials Survey, Nover-Armstrong recommended additional assessment of building materials surrounding the windows and surrounding impacted floor and wall samples. Due to the detection of PCBs within the Method Blank sample, Nover-Armstrong recommended re-sampling and analysis of the building materials with PCB concentrations less than 16 ppm to determine / confirm the presence of PCBs.

2.0 Site-Specific QAPP Addendum A1, Revision 1.2, June 2012 Implementation

Based upon the findings of the Initial Hazardous Materials Survey, a *Site-Specific QAPP Addendum A1*, dated June 2012, was completed for the supplemental analysis of PCBs in concrete masonry units (CMU) surrounding the windows of the facility and in building materials (concrete, caulking, and mortar) surrounding impacted floor and wall samples. The goal of this project is to identify potential PCB impacts from window caulking, floor caulking, wall caulking, and/or wall mortar leaching into building materials adjacent to the previously-identified PCB-impacted areas and to assess the limits of PCB contamination, if identified. The Site-Specific QAPP Addendum A1, Revision 1.2 documented all proposed sampling procedures, laboratory analytical methods, equipment necessary to complete the sampling procedures, quality assurance / quality control measures to be taken, and data assessment protocols. Please refer to the QAPP Addendum for a complete description (attached as Appendix D).

3.0 Summary of July 2012 Sampling Activities

CMUs Surrounding Windows

Nover-Armstrong collected concrete samples from CMUs adjacent to ten selected windows at the site between July 11 and 13, 2012. Each window was identified as one group (Groups A through J), as depicted in Figure 2. Each group is comprised of eight grab sampling points.

The spatial distribution of samples collected from CMUs surrounding individual windows is depicted in Figure 3. The samples were obtained from all four sides of each window at a distance from the window equaling approximately one-half of the CMU length (6 inches). A typical representation of the sampling completed at the windows is depicted in Figure 4. Additional samples were collected from the terminus of one cracked area originating at a window on an exterior wall on each side of the building (four total). Please refer to Appendix A – Photographic Documentation. The concrete samples were obtained following the guidance provided in the USEPA Region 1 *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs), Revision 4 (May 2011), EIASOP_POROUSSAMPLING* and in accordance with the Code of Federal Regulations (CFR) 40 CFR 761. This guidance was provided within the Standard Operating Procedures appendix of the Site-Specific QAPP Addendum A1.

A rotary impact hammer equipped with a one-inch diameter carbide drill bit was used to generate a fine concrete powder, which was collected into appropriate containers provided by Alpha. Samples were collected at approximately one-inch intervals and four to eight holes were required to obtained the required amount of concrete powder for laboratory quality assurance purposes. A total of 96 concrete grab samples were collected from surrounding the windows and six additional duplicate samples were collected, as noted in the chain of custody. The samples were submitted to Alpha for laboratory analysis of PCBs (Soxhlet Extraction Method – SW846 3540C / 8082).

Disposable sampling equipment was discarded after completing the sampling task and was not reused. All non-disposable sampling equipment was decontaminated after each sample was collected according to the guidelines for decontamination provided in the *Standard Operating Procedure for Sampling Porous Surfaces for PCBs, Revision 4 (May 2011), EIASOP_POROUSSAMPLING* guidance provided in Appendix A of the QAPP Addendum A1. All rinse liquids generated during the decontamination process were stored in a 55-gallon drum pending laboratory results. Six Equipment Blank samples, consisting of rinse water after the drill bit was decontaminated, were collected and submitted to Alpha for laboratory analysis of PCBs (Soxhlet Extraction Method – SW846 3540C / 8082). Field sampling logs are provided in Appendix B – Field Sampling Logs.

Building Materials Not Surrounding Windows

On July 17, 2012, Nover-Armstrong collected additional samples surrounding each of four interior and/or exterior building material sampling locations that were not associated with window caulking, but were previously identified during the November 2011 Initial Hazardous Materials Survey as containing PCBs. These samples were identified as WALL-1 (interior), WALL-3 (interior), WALL-4 (exterior), and FLOOR-2 (interior). Refer to Figures 5 and 6 and Appendix A – Photographic Documentation (Photos 17 – 20) for sampling locations. The samples were obtained from all four sides of each sampling location at a vertical distance of approximately 12 inches and at a horizontal distance of approximately 6 inches from the original November 2011 sample. The building materials consisted of caulking, concrete, and mortar, depending on the sample location. The building material samples were obtained following the guidance provided in the USEPA Region 1 *Standard Operating Procedure for Sampling Porous Surface for PCBs, Revision 4 (May 2011), EIASOP_POROUSSAMPLING* and in accordance with 40 CFR 761.

Concrete and mortar samples were collected using a rotary impact hammer equipped with a one-inch diameter carbide drill bit to generate a fine concrete and / or mortar powder, which were collected into appropriate containers provided by Alpha. For caulking samples, a chisel and sharp knife were used to generate representative samples.

A total of twelve concrete / mortar grab samples and four caulking grab samples were collected and submitted to Alpha for laboratory analysis of PCBs (Soxhlet Extraction Method – SW846 3540C/8082). Field sampling logs are provided in Appendix B – Field Sampling Logs.

The field equipment that was used for the sampling is listed below in Table 2.

Table 2: Field Equipment List

Equipment Type	Model
Makita 6 Amp 5/8" Hammer Drill	HP1640
Dewalt Premium Percussion 1" x 12" Carbide Drill Bit	DW5249
Spoon, chisel & knife (for sample collection)	N/A
Decontamination supplies	Refer to SOP.NAA_C.05.1

4.0 Results of Laboratory Analysis

The attached Table 3 – Summary of 07.2012 Building Materials Analytical Results summarizes analytical findings. Concentrations of PCBs were detected in 39 of the CMU samples at concentrations ranging from 0.0381 to 0.5 milligrams per kilogram (mg/kg), in nine of the concrete samples collected from around the previous samples collected in November 2011 at concentrations ranging from 0.0558 to 0.922 mg/kg, and all four of the caulking samples. PCB concentrations detected in the floor caulking ranged from 0.651 to 1.52 mg/kg, while PCB concentrations detected in the wall caulking around WALL-3 ranged from 18,400 to 22,500 mg/kg.

The results of the laboratory analysis completed on the concrete powder samples collected around the CMUs indicate the CMUs surrounding the window units have not been significantly impacted by the presence of PCBs within the window caulking. Furthermore, the results of the laboratory analysis completed on the concrete powder surrounding the previous building materials sampling locations in November 2011 also indicate that these building materials have not been significantly impacted by PCBs. Confirmatory sampling of the floor and wall caulking confirm that PCBs are present that would require proper disposal upon building demolition.

5.0 Data Usability

The data provided with this Supplemental Building Materials Survey were evaluated for usability in accordance with the Site-Specific QAPP Addendum A1.

5.1 Presumptive Certainty

As indicated in the laboratory reports provided in Appendix C, the analytical laboratory has indicated that the conditions for Presumptive Certainty under applicable provisions of the MCP and MassDEP policy guidance were met. The laboratory provided the necessary Analytical Method Report Certification Forms, case narratives, and QA/QC data reporting; these are included in the laboratory reports in Appendix C.

5.2 Data Quality

In an effort to verify that the data collected were suitable for use in Site Characterization, Nover-Armstrong reviewed the laboratory analytical reports generated as part of the assessment activities. This review included the report narrative, surrogate recovery results and the "MassDEP MCP Response Action Analytical Report Certification" (or equivalent) included in each data package. Surrogate recoveries for the specific analyses were reported as being within the range specified in the analytical methods, with certain exceptions noted, which were discussed in the report's narrative. The certification form included with each analytical data package indicated that:

- Samples were received by the laboratory in a condition consistent with the Chain of Custody.
- QA/QC procedures required for the analytical methods were followed and any data not meeting the appropriate performance standards were discussed in the case narrative.
- Analytical data met all the requirements for Presumptive Certainty, as described in Section 2.0 of the MassDEP document CAM VII A.
- All QC performance standards and recommendations for the specified methods were achieved, or data not meeting the appropriate performance standards were discussed in the case narrative.

5.3 Data Usability Conclusion

Based on the information provided in the laboratory analytical reports, the required QA/QC procedures were followed, and all performance/acceptance standards for the required QA/QC procedures were achieved or discussed. It is Nover-Armstrong's opinion that the concrete and caulking samples collected at the site:

- Generally meet the requirements for presumptive certainty as described in the MassDEP (WSC-CAM-VII A) policy for the acquisition and reporting of analytical data,
- Are acceptable for use in site characterization and conducting response actions under the QAPP at this Site, and
- Are deemed usable in support of opinions and conclusions for this site.

6.0 Conclusions and Recommendations

Based upon laboratory analytical results, CMUs surrounding the windows and previously-identified PCB-containing window caulking have not been significantly impacted by the leaching of PCBs. As such, a subsurface investigation surrounding the building to determine if PCBs have been leaching to site soil and / or pavement is not deemed necessary.

Building materials surrounding the window, floor, and wall caulking will not have to be managed as PCB bulk product or remediation waste.

The results of the laboratory analysis do confirm however that the window caulking and wall caulking have elevated concentrations of PCBs (> 50 ppm) that would require these materials to be disposed as a PCB remediation waste during building demolition, pursuant to TSCA requirements.

Nover-Armstrong appreciates the opportunity to provide you with environmental services. If you have any questions or comments regarding this report, please do not hesitate to contact our office.

Sincerely,

Nover-Armstrong Associates, Inc.

Marylou Armstrong, LSP
Principal

Attachments:

Figures:
Figure 1 – Site Location
Figure 2 – CMU Sampling Groups
Figure 3 – Individual Window Sampling Scheme
Figure 4 – CMU Sampling Group A
Figure 5 – Floor and Wall Material Sampling Locations not Surrounding Windows
Figure 6 – Individual Floor and Wall Sampling Groups

Tables:
Table 1 – Summary of 11.2011 Building Materials Analytical Results (for PCBs)
Table 3 – Summary of 7.2012 Building Materials Analytical Results

Appendices:
Appendix A – Photographic Documentation
Appendix B – Field Sampling Logs
Appendix C – Alpha Analytical Reports
Appendix D – *Site-Specific QAPP Addendum A1*, dated June 2012

FIGURES

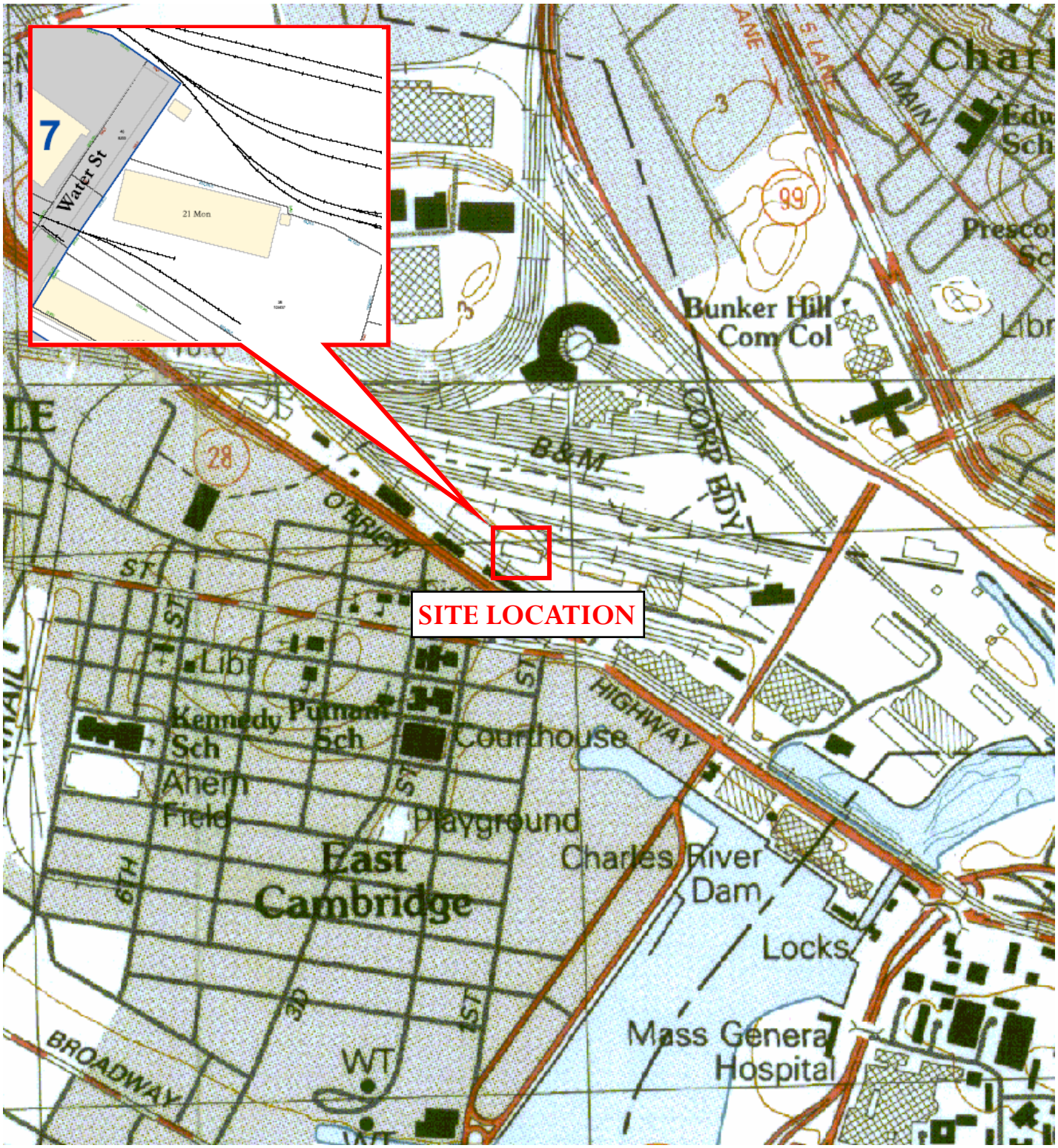


Figure 1 - Site Location

MBTA Tire Maintenance Facility

21 Water Street, Cambridge, Massachusetts

NAA File P2814

Figure 2 - CMU Sampling Groups

MBTA Tire Maintenance Facility
21 Water Street
Cambridge, Massachusetts
NAA File P2814

NOVER-ARMSTRONG ASSOCIATES, INC.

NOTES:
1. EACH SAMPLE WILL BE COLLECTED BY DRILLING 0-1" INTO THE EXTERIOR CONCRETE WALL SURFACE SURROUNDING THE WINDOW.

APPROXIMATE SAMPLING LOCATION

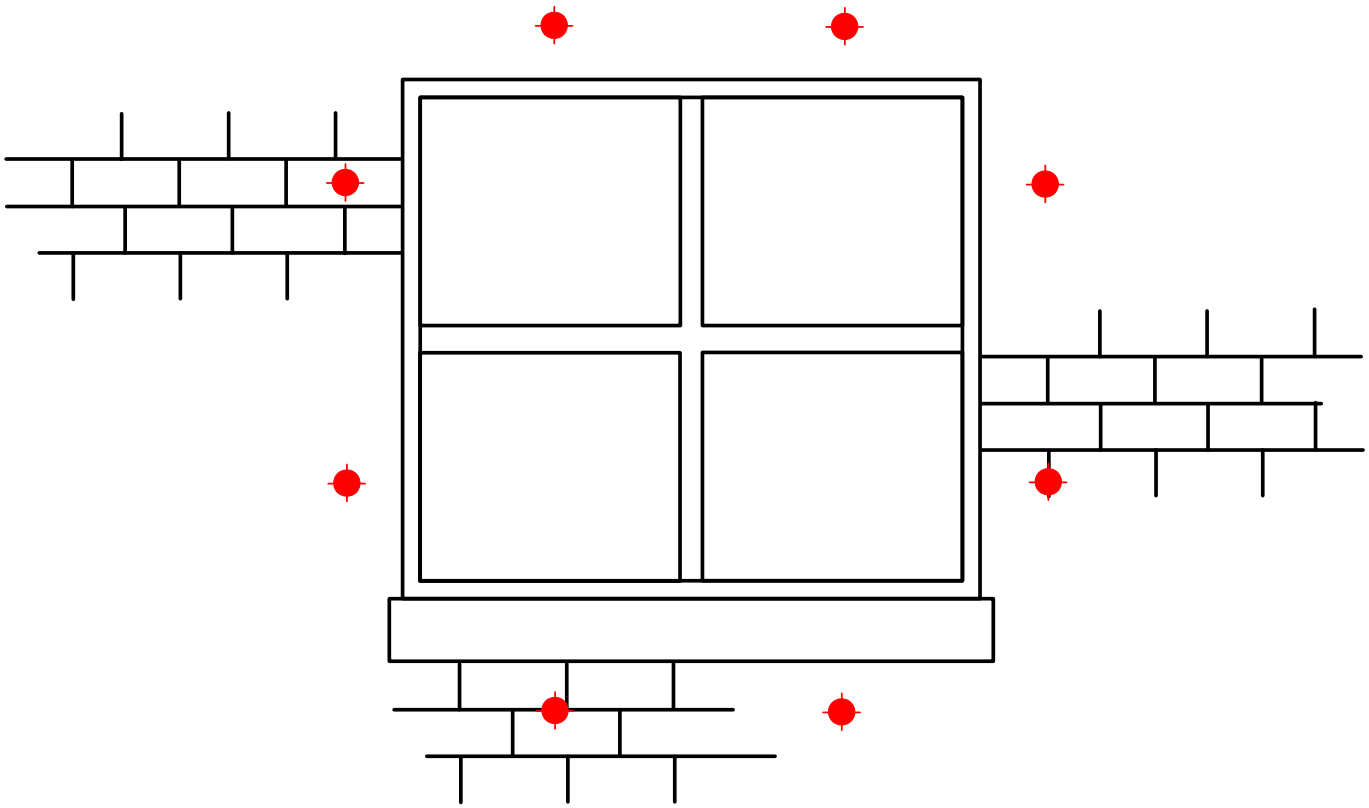


Figure 3: Individual Window Sampling Scheme
21 Water Street
Cambridge, Massachusetts
NAA File P2814

NOVER-ARMSTRONG ASSOCIATES, INC.

Site Plan Not to Scale

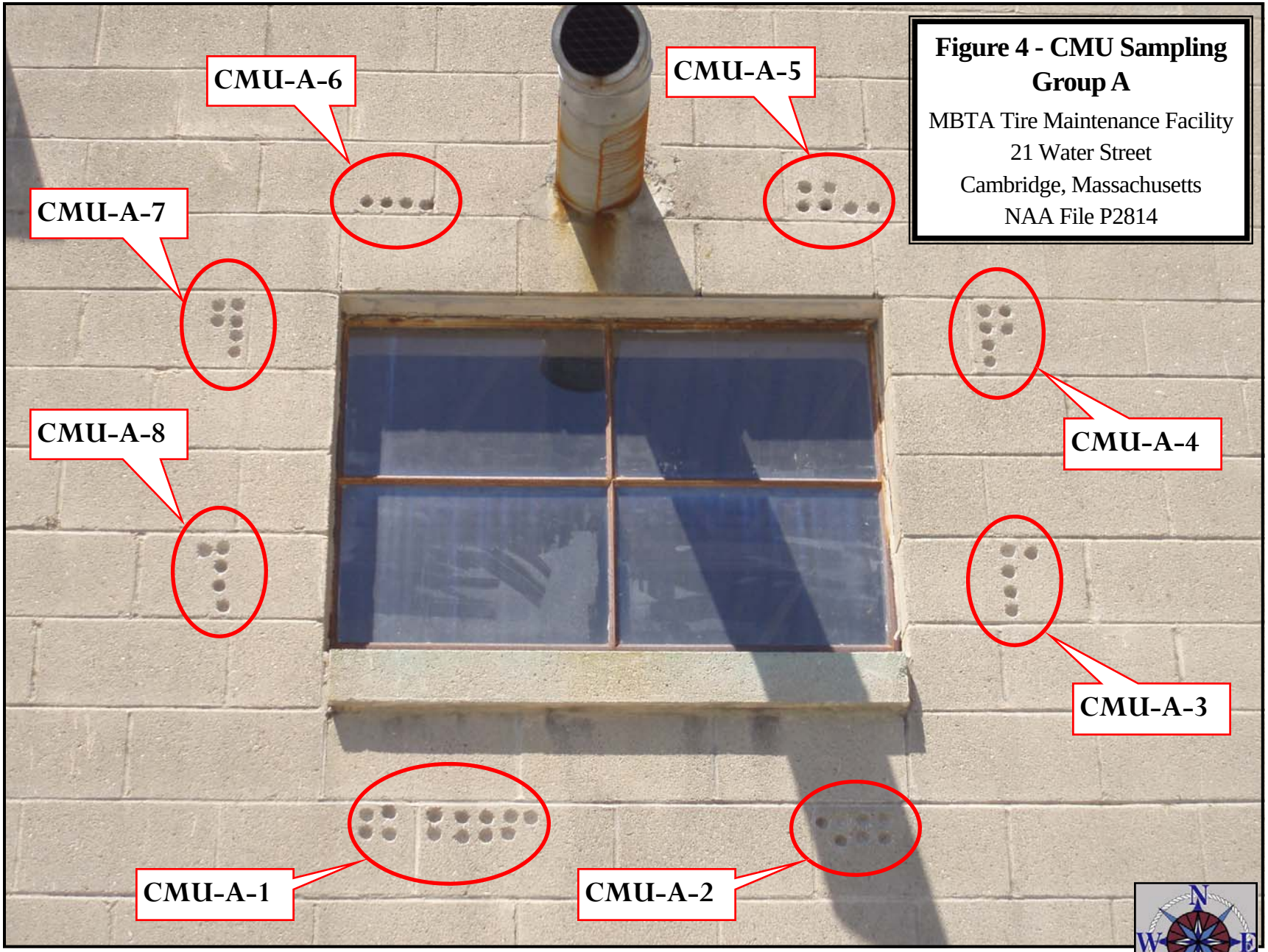
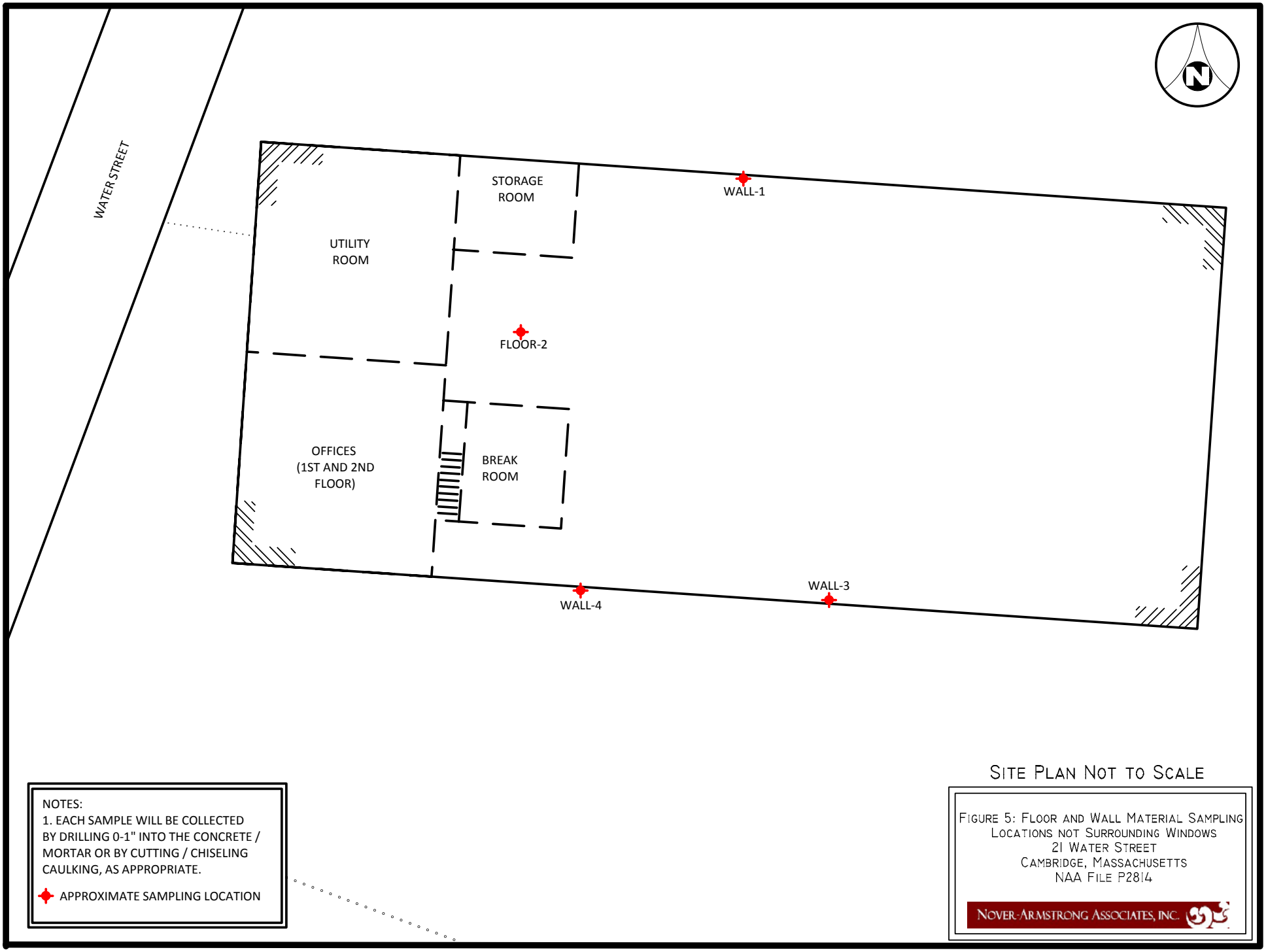


Figure 4 - CMU Sampling Group A

MBTA Tire Maintenance Facility
21 Water Street
Cambridge, Massachusetts
NAA File P2814



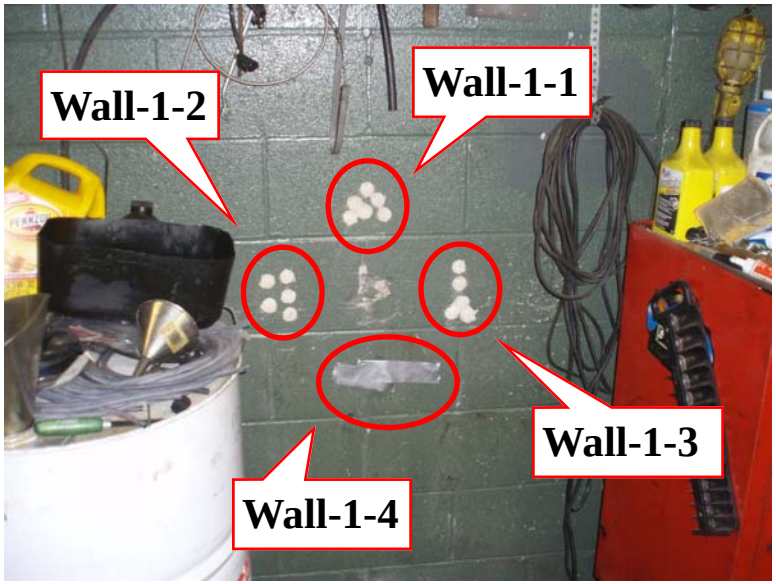
NOTES:
1. EACH SAMPLE WILL BE COLLECTED BY DRILLING 0-1" INTO THE CONCRETE / MORTAR OR BY CUTTING / CHISELING CAULKING, AS APPROPRIATE.

APPROXIMATE SAMPLING LOCATION

SITE PLAN NOT TO SCALE

FIGURE 5: FLOOR AND WALL MATERIAL SAMPLING LOCATIONS NOT SURROUNDING WINDOWS
21 WATER STREET
CAMBRIDGE, MASSACHUSETTS
NAA FILE P2814

NOVER-ARMSTRONG ASSOCIATES, INC.



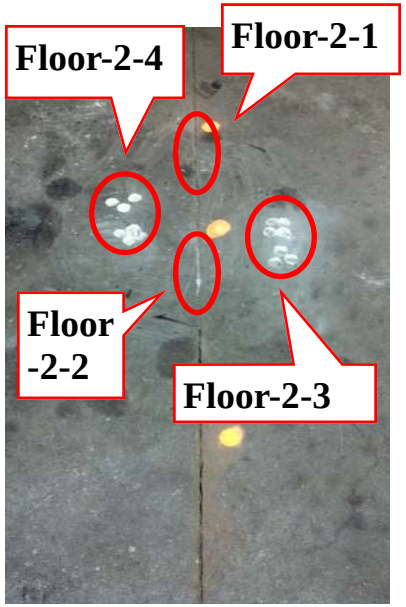
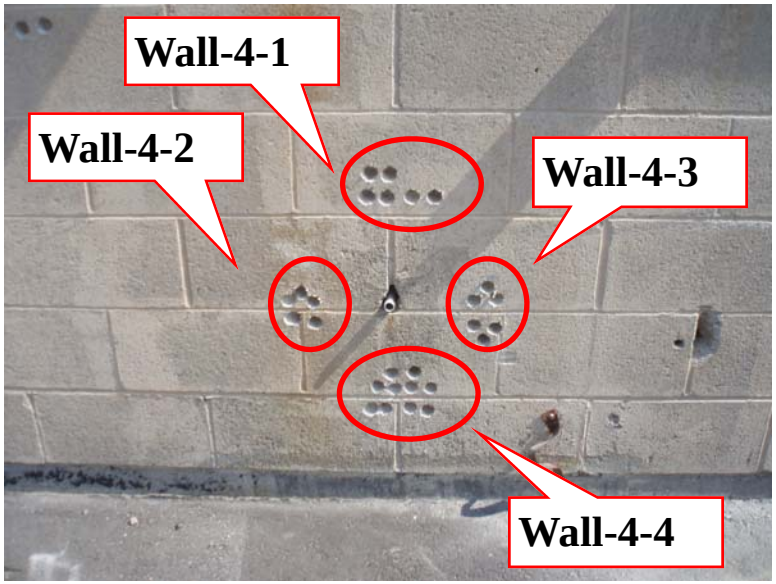


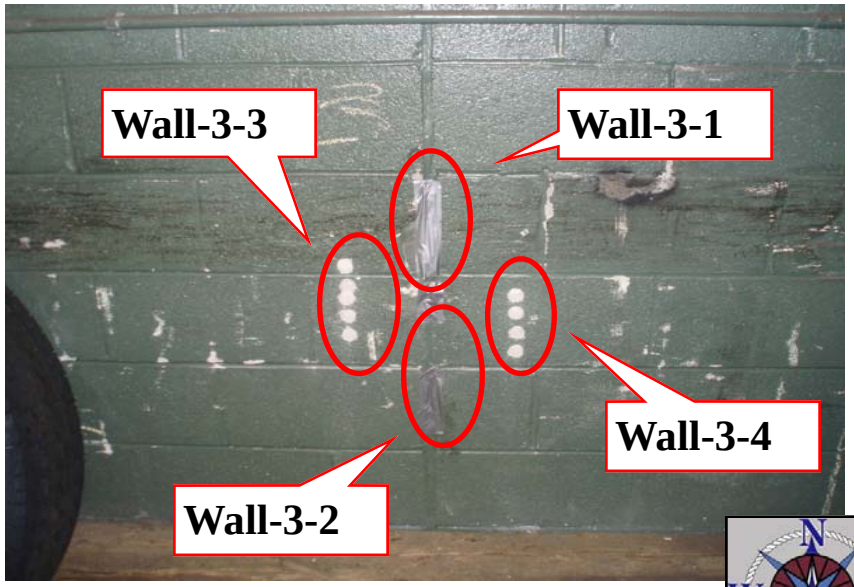
Figure 6 - Individual Wall & Floor Sampling Groups

MBTA Tire Maintenance Facility

21 Water Street

Cambridge, Massachusetts





TABLES

TABLE 1 - Summary of 11.2011 Building Materials Analytical Results (PCBs)

SAMPLE ID	FLOOR-1	FLOOR-2	FLOOR-3	FLOOR-4	WALL-1	WALL-2	WALL-3	WALL-4	WINDOW-1	WINDOW-2	WINDOW-3	Method Blank
SAMPLE MATERIAL	**caulking**	**caulking**	**caulking**	**caulking**	**painted mortar**	**mortar**	**painted caulking**	**mortar**	**caulking**	**caulking**	**caulking**	
SAMPLING DATE	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	11/2/2011	
LAB SAMPLE ID	L1118311-08	L1118311-09	L1118311-10	L1118311-11	L1118311-01	L1118311-02	L1118311-03	L1118311-04	L1118311-05	L1118311-06	L1118311-07	
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Polychlorinated Biphenyls (PCBs)												
Aroclor 1016	BRL(<0.104)	BRL(<1.42)	BRL(<0.0621)	BRL(<0.14)	BRL(<0.739)	BRL(<0.528)	BRL(<19300)	BRL(<0.708)	BRL(<56000)	BRL(<12500)	BRL(<48400)	BRL(<0.0562)
Aroclor 1221	BRL(<0.104)	BRL(<1.42)	BRL(<0.0621)	BRL(<0.14)	BRL(<0.739)	BRL(<0.528)	BRL(<19300)	BRL(<0.708)	BRL(<56000)	BRL(<12500)	BRL(<48400)	BRL(<0.0562)
Aroclor 1232	BRL(<0.104)	BRL(<1.42)	BRL(<0.0621)	BRL(<0.14)	BRL(<0.739)	BRL(<0.528)	BRL(<19300)	BRL(<0.708)	BRL(<56000)	BRL(<12500)	BRL(<48400)	BRL(<0.0562)
Aroclor 1242	BRL(<0.104)	BRL(<1.42)	BRL(<0.0621)	BRL(<0.14)	BRL(<0.739)	BRL(<0.528)	BRL(<19300)	BRL(<0.708)	BRL(<56000)	BRL(<12500)	BRL(<48400)	BRL(<0.0562)
Aroclor 1248	BRL(<0.0694)	BRL(<0.943)	BRL(<0.0414)	BRL(<0.0934)	BRL(<0.493)	BRL(<0.352)	BRL(<12900)	BRL(<0.472)	BRL(<37300)	BRL(<8330)	BRL(<32200)	BRL(<0.0374)
Aroclor 1254	**0.313**	BRL(<1.42)	**0.172**	**0.665**	BRL(<0.739)	BRL(<0.528)	BRL(<19300)	BRL(<0.708)	BRL(<56000)	BRL(<12500)	BRL(<48400)	BRL(<0.0562)
Aroclor 1260	**0.394**	**40.4**	**0.265**	**0.336**	**1.24**	BRL(<0.352)	**191,000**	**11.4**	**993,000**	**110,000**	**620,000**	**16.2**
Aroclor 1262	BRL(<0.0347)	BRL(<0.472)	BRL(<0.0207)	BRL(<0.0467)	BRL(<0.246)	BRL(<0.176)	BRL(<6440)	BRL(<0.236)	BRL(<18600)	BRL(<4170)	BRL(<16100)	BRL(<0.0187)
Aroclor 1268	BRL(<0.0347)	BRL(<0.472)	BRL(<0.0207)	BRL(<0.0467)	BRL(<0.246)	BRL(<0.176)	BRL(<6440)	BRL(<0.236)	BRL(<18600)	BRL(<4170)	BRL(<16100)	BRL(<0.0187)

Notes: Concentrations presented in mg/kg - milligrams per kilogram - parts per million
BRL - Below laboratory reporting limit

TABLE 3 - Summary of 07.2012 Building Materials Analytical Results

SAMPLE ID	CMU-A-1	CMU-A-1_DUP	CMU-A-2	CMU-A-3	CMU-A-4	CMU-A-5	CMU-A-6	CMU-A-7	CMU-A-8	CMU-B-1	CMU-B-2	CMU-B-3	CMU-B-4
SAMPLING DATE	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012
LAB SAMPLE ID	L1212415-02	L1212415-03	L1212415-04	L1212415-05	L1212415-06	L1212415-07	L1212415-08	L1212415-09	L1212415-10	L1212415-11	L1212415-12	L1212415-13	L1212415-14
SAMPLE MATRIX	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Polychlorinated Biphenyls (PCBs)													
Aroclor 1016	BRL(<0.0514)	BRL(<0.0527)	BRL(<0.0509)	BRL(<0.0537)	BRL(<0.0508)	BRL(<0.0554)	BRL(<0.0576)	BRL(<0.0522)	BRL(<0.0584)	BRL(<0.0562)	BRL(<0.0487)	BRL(<0.0511)	BRL(<0.0529)
Aroclor 1221	BRL(<0.0514)	BRL(<0.0527)	BRL(<0.0509)	BRL(<0.0537)	BRL(<0.0508)	BRL(<0.0554)	BRL(<0.0576)	BRL(<0.0522)	BRL(<0.0584)	BRL(<0.0562)	BRL(<0.0487)	BRL(<0.0511)	BRL(<0.0529)
Aroclor 1232	BRL(<0.0514)	BRL(<0.0527)	BRL(<0.0509)	BRL(<0.0537)	BRL(<0.0508)	BRL(<0.0554)	BRL(<0.0576)	BRL(<0.0522)	BRL(<0.0584)	BRL(<0.0562)	BRL(<0.0487)	BRL(<0.0511)	BRL(<0.0529)
Aroclor 1242	BRL(<0.0514)	BRL(<0.0527)	BRL(<0.0509)	BRL(<0.0537)	BRL(<0.0508)	BRL(<0.0554)	BRL(<0.0576)	BRL(<0.0522)	BRL(<0.0584)	BRL(<0.0562)	BRL(<0.0487)	BRL(<0.0511)	BRL(<0.0529)
Aroclor 1248	BRL(<0.0342)	BRL(<0.0351)	BRL(<0.034)	BRL(<0.0358)	BRL(<0.0338)	BRL(<0.037)	BRL(<0.0384)	BRL(<0.0348)	BRL(<0.0389)	BRL(<0.0374)	BRL(<0.0325)	BRL(<0.0341)	BRL(<0.0353)
Aroclor 1254	BRL(<0.0514)	BRL(<0.0527)	BRL(<0.0509)	BRL(<0.0537)	BRL(<0.0508)	BRL(<0.0554)	BRL(<0.0576)	BRL(<0.0522)	BRL(<0.0584)	BRL(<0.0562)	BRL(<0.0487)	BRL(<0.0511)	BRL(<0.0529)
Aroclor 1260	0.139	0.16	0.0634	BRL(<0.0358)	BRL(<0.0338)	BRL(<0.037)	BRL(<0.0384)	BRL(<0.0348)	BRL(<0.0389)	0.112	0.0554	BRL(<0.0341)	BRL(<0.0353)
Aroclor 1262	BRL(<0.0171)	BRL(<0.0176)	BRL(<0.017)	BRL(<0.0179)	BRL(<0.0169)	BRL(<0.0185)	BRL(<0.0192)	BRL(<0.0174)	BRL(<0.0194)	BRL(<0.0187)	BRL(<0.0162)	BRL(<0.017)	BRL(<0.0176)
Aroclor 1268	BRL(<0.0171)	BRL(<0.0176)	BRL(<0.017)	BRL(<0.0179)	BRL(<0.0169)	BRL(<0.0185)	BRL(<0.0192)	BRL(<0.0174)	BRL(<0.0194)	BRL(<0.0187)	BRL(<0.0162)	BRL(<0.017)	BRL(<0.0176)

SAMPLE ID	CMU-B-5	CMU-B-6	CMU-B-7	CMU-B-8	CMU-C-1	CMU-C-1_DUP	CMU-C-2	CMU-C-3	CMU-C-4	CMU-C-5	CMU-C-6	CMU-C-7	CMU-C-8
SAMPLING DATE	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012	7/12/2012
LAB SAMPLE ID	L1212415-15	L1212415-16	L1212415-17	L1212415-18	L1212415-19	L1212415-20	L1212415-21	L1212415-22	L1212415-23	L1212415-24	L1212415-25	L1212415-26	L1212415-27
SAMPLE MATRIX	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Polychlorinated Biphenyls (PCBs)													
Aroclor 1016	BRL(<0.055)	BRL(<0.0512)	BRL(<0.0559)	BRL(<0.0534)	BRL(<0.054)	BRL(<0.052)	BRL(<0.0519)	BRL(<0.0544)	BRL(<0.0556)	BRL(<0.0513)	BRL(<0.057)	BRL(<0.0569)	BRL(<0.0552)
Aroclor 1221	BRL(<0.055)	BRL(<0.0512)	BRL(<0.0559)	BRL(<0.0534)	BRL(<0.054)	BRL(<0.052)	BRL(<0.0519)	BRL(<0.0544)	BRL(<0.0556)	BRL(<0.0513)	BRL(<0.057)	BRL(<0.0569)	BRL(<0.0552)
Aroclor 1232	BRL(<0.055)	BRL(<0.0512)	BRL(<0.0559)	BRL(<0.0534)	BRL(<0.054)	BRL(<0.052)	BRL(<0.0519)	BRL(<0.0544)	BRL(<0.0556)	BRL(<0.0513)	BRL(<0.057)	BRL(<0.0569)	BRL(<0.0552)
Aroclor 1242	BRL(<0.055)	BRL(<0.0512)	BRL(<0.0559)	BRL(<0.0534)	BRL(<0.054)	BRL(<0.052)	BRL(<0.0519)	BRL(<0.0544)	BRL(<0.0556)	BRL(<0.0513)	BRL(<0.057)	BRL(<0.0569)	BRL(<0.0552)
Aroclor 1248	BRL(<0.0367)	BRL(<0.0341)	BRL(<0.0372)	BRL(<0.0356)	BRL(<0.036)	BRL(<0.0347)	BRL(<0.0346)	BRL(<0.0363)	BRL(<0.0371)	BRL(<0.0342)	BRL(<0.038)	BRL(<0.038)	BRL(<0.0368)
Aroclor 1254	BRL(<0.055)	BRL(<0.0512)	BRL(<0.0559)	BRL(<0.0534)	BRL(<0.054)	BRL(<0.052)	BRL(<0.0519)	BRL(<0.0544)	BRL(<0.0556)	BRL(<0.0513)	BRL(<0.057)	BRL(<0.0569)	BRL(<0.0552)
Aroclor 1260	BRL(<0.0367)	BRL(<0.0341)	BRL(<0.0372)	BRL(<0.0356)	0.268	0.243	0.0784	0.0451	0.0592	BRL(<0.0342)	BRL(<0.038)	0.0381	0.0687
Aroclor 1262	BRL(<0.0183)	BRL(<0.0171)	BRL(<0.0186)	BRL(<0.0178)	BRL(<0.018)	BRL(<0.0173)	BRL(<0.0173)	BRL(<0.0181)	BRL(<0.0186)	BRL(<0.0171)	BRL(<0.019)	BRL(<0.019)	BRL(<0.0184)
Aroclor 1268	BRL(<0.0183)	BRL(<0.0171)	BRL(<0.0186)	BRL(<0.0178)	BRL(<0.018)	BRL(<0.0173)	BRL(<0.0173)	BRL(<0.0181)	BRL(<0.0186)	BRL(<0.0171)	BRL(<0.019)	BRL(<0.019)	BRL(<0.0184)

SAMPLE ID	CMU-D-1	CMU-D-2	CMU-D-3	CMU-D-4	CMU-D-5	CMU-D-6	CMU-D-7	CMU-D-8	CMU-E-1	CMU-E-2	CMU-E-3	CMU-E-4	CMU-E-5
SAMPLING DATE	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/12/2012	7/12/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/12/2012
LAB SAMPLE ID	L1212503-01	L1212503-02	L1212503-03	L1212503-04	L1212415-29	L1212415-30	L1212503-05	L1212503-06	L1212503-07	L1212503-08	L1212503-09	L1212503-10	L1212415-31
SAMPLE MATRIX	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Polychlorinated Biphenyls (PCBs)													
Aroclor 1016	BRL(<0.0587)	BRL(<0.0562)	BRL(<0.0581)	BRL(<0.0576)	BRL(<0.054)	BRL(<0.0522)	BRL(<0.0574)	BRL(<0.0578)	BRL(<0.0575)	BRL(<0.0582)	BRL(<0.0585)	BRL(<0.0588)	BRL(<0.0502)
Aroclor 1221	BRL(<0.0587)	BRL(<0.0562)	BRL(<0.0581)	BRL(<0.0576)	BRL(<0.054)	BRL(<0.0522)	BRL(<0.0574)	BRL(<0.0578)	BRL(<0.0575)	BRL(<0.0582)	BRL(<0.0585)	BRL(<0.0588)	BRL(<0.0502)
Aroclor 1232	BRL(<0.0587)	BRL(<0.0562)	BRL(<0.0581)	BRL(<0.0576)	BRL(<0.054)	BRL(<0.0522)	BRL(<0.0574)	BRL(<0.0578)	BRL(<0.0575)	BRL(<0.0582)	BRL(<0.0585)	BRL(<0.0588)	BRL(<0.0502)
Aroclor 1242	BRL(<0.0587)	BRL(<0.0562)	BRL(<0.0581)	BRL(<0.0576)	BRL(<0.054)	BRL(<0.0522)	BRL(<0.0574)	BRL(<0.0578)	BRL(<0.0575)	BRL(<0.0582)	BRL(<0.0585)	BRL(<0.0588)	BRL(<0.0502)
Aroclor 1248	BRL(<0.0391)	BRL(<0.0374)	BRL(<0.0388)	BRL(<0.0384)	BRL(<0.036)	BRL(<0.0348)	BRL(<0.0382)	BRL(<0.0385)	BRL(<0.0383)	BRL(<0.0388)	BRL(<0.039)	BRL(<0.0392)	BRL(<0.0335)
Aroclor 1254	BRL(<0.0587)	BRL(<0.0562)	BRL(<0.0581)	BRL(<0.0576)	BRL(<0.054)	BRL(<0.0522)	BRL(<0.0574)	BRL(<0.0578)	BRL(<0.0575)	BRL(<0.0582)	BRL(<0.0585)	BRL(<0.0588)	BRL(<0.0502)
Aroclor 1260	0.223	0.0985	BRL(<0.0388)	BRL(<0.0384)	BRL(<0.036)	BRL(<0.0348)	BRL(<0.0382)	BRL(<0.0385)	0.0522	BRL(<0.0388)	BRL(<0.039)	BRL(<0.0392)	BRL(<0.0335)
Aroclor 1262	BRL(<0.0196)	BRL(<0.0187)	BRL(<0.0194)	BRL(<0.0192)	BRL(<0.018)	BRL(<0.0174)	BRL(<0.0191)	BRL(<0.0193)	BRL(<0.0192)	BRL(<0.0194)	BRL(<0.0195)	BRL(<0.0196)	BRL(<0.0168)
Aroclor 1268	BRL(<0.0196)	BRL(<0.0187)	BRL(<0.0194)	BRL(<0.0192)	BRL(<0.018)	BRL(<0.0174)	BRL(<0.0191)	BRL(<0.0193)	BRL(<0.0192)	BRL(<0.0194)	BRL(<0.0195)	BRL(<0.0196)	BRL(<0.0168)

TABLE 3 - Summary of 07.2012 Building Materials Analytical Results

SAMPLE ID	CMU-E-6	CMU-E-7	CMU-E-8	CMU-F-1	CMU-F-2	CMU-F-3	CMU-F-4	CMU-F-5	CMU-F-6	CMU-F-7	CMU-F-8	CMU-G-1	CMU-G-2
SAMPLING DATE	7/12/2012	7/13/2012	7/13/2012	7/11/2012	7/11/2012	7/11/2012	7/11/2012	7/11/2012	7/11/2012	7/11/2012	7/11/2012	7/11/2012	7/11/2012
LAB SAMPLE ID	L1212415-32 R1	L1212503-11	L1212503-12	L1212310-11	L1212310-12	L1212310-13	L1212310-14	L1212310-15	L1212310-16	L1212310-17	L1212310-18	L1212310-02	L1212310-03
SAMPLE MATRIX	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Polychlorinated Biphenyls (PCBs)													
Aroclor 1016	BRL(<0.0577)	BRL(<0.0582)	BRL(<0.0571)	BRL(<0.0549)	BRL(<0.056)	BRL(<0.0535)	BRL(<0.0579)	BRL(<0.0546)	BRL(<0.0505)	BRL(<0.0563)	BRL(<0.0511)	BRL(<0.0521)	BRL(<0.0548)
Aroclor 1221	BRL(<0.0577)	BRL(<0.0582)	BRL(<0.0571)	BRL(<0.0549)	BRL(<0.056)	BRL(<0.0535)	BRL(<0.0579)	BRL(<0.0546)	BRL(<0.0505)	BRL(<0.0563)	BRL(<0.0511)	BRL(<0.0521)	BRL(<0.0548)
Aroclor 1232	BRL(<0.0577)	BRL(<0.0582)	BRL(<0.0571)	BRL(<0.0549)	BRL(<0.056)	BRL(<0.0535)	BRL(<0.0579)	BRL(<0.0546)	BRL(<0.0505)	BRL(<0.0563)	BRL(<0.0511)	BRL(<0.0521)	BRL(<0.0548)
Aroclor 1242	BRL(<0.0577)	BRL(<0.0582)	BRL(<0.0571)	BRL(<0.0549)	BRL(<0.056)	BRL(<0.0535)	BRL(<0.0579)	BRL(<0.0546)	BRL(<0.0505)	BRL(<0.0563)	BRL(<0.0511)	BRL(<0.0521)	BRL(<0.0548)
Aroclor 1248	BRL(<0.0385)	BRL(<0.0388)	BRL(<0.0381)	BRL(<0.0366)	BRL(<0.0373)	BRL(<0.0356)	BRL(<0.0386)	BRL(<0.0364)	BRL(<0.0337)	BRL(<0.0375)	BRL(<0.0341)	BRL(<0.0347)	BRL(<0.0366)
Aroclor 1254	BRL(<0.0577)	BRL(<0.0582)	BRL(<0.0571)	BRL(<0.0549)	BRL(<0.056)	BRL(<0.0535)	BRL(<0.0579)	BRL(<0.0546)	BRL(<0.0505)	BRL(<0.0563)	BRL(<0.0511)	BRL(<0.0521)	BRL(<0.0548)
Aroclor 1260	0.0532	0.0482	0.0499	0.0842	BRL(<0.0373)	0.0572	0.0574	BRL(<0.0364)	BRL(<0.0337)	BRL(<0.0375)	BRL(<0.0341)	0.0959	0.106
Aroclor 1262	BRL(<0.0192)	BRL(<0.0194)	BRL(<0.019)	BRL(<0.0183)	BRL(<0.0186)	BRL(<0.0178)	BRL(<0.0193)	BRL(<0.0182)	BRL(<0.0168)	BRL(<0.0188)	BRL(<0.017)	BRL(<0.0174)	BRL(<0.0183)
Aroclor 1268	BRL(<0.0192)	BRL(<0.0194)	BRL(<0.019)	BRL(<0.0183)	BRL(<0.0186)	BRL(<0.0178)	BRL(<0.0193)	BRL(<0.0182)	BRL(<0.0168)	BRL(<0.0188)	BRL(<0.017)	BRL(<0.0174)	BRL(<0.0183)

SAMPLE ID	CMU-G-3	CMU-G-4	CMU-G-5	CMU-G-6	CMU-G-7	CMU-G-8	CMU-H-1	CMU-H-1_DUP	CMU-H-2	CMU-H-3	CMU-H-4	CMU-H-5	CMU-H-6
SAMPLING DATE	7/11/2012	7/11/2012	7/11/2012	7/11/2012	7/11/2012	7/11/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012
LAB SAMPLE ID	L1212310-04	L1212310-05	L1212310-06	L1212310-07	L1212310-08	L1212310-09	L1212503-14	L1212503-15	L1212503-16	L1212503-17	L1212503-18	L1212503-19	L1212503-20
SAMPLE MATRIX	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Polychlorinated Biphenyls (PCBs)													
Aroclor 1016	BRL(<0.0514)	BRL(<0.0508)	BRL(<0.0505)	BRL(<0.0514)	BRL(<0.0581)	BRL(<0.0595)	BRL(<0.0567)	BRL(<0.0559)	BRL(<0.0569)	BRL(<0.0565)	BRL(<0.0586)	BRL(<0.0565)	BRL(<0.0567)
Aroclor 1221	BRL(<0.0514)	BRL(<0.0508)	BRL(<0.0505)	BRL(<0.0514)	BRL(<0.0581)	BRL(<0.0595)	BRL(<0.0567)	BRL(<0.0559)	BRL(<0.0569)	BRL(<0.0565)	BRL(<0.0586)	BRL(<0.0565)	BRL(<0.0567)
Aroclor 1232	BRL(<0.0514)	BRL(<0.0508)	BRL(<0.0505)	BRL(<0.0514)	BRL(<0.0581)	BRL(<0.0595)	BRL(<0.0567)	BRL(<0.0559)	BRL(<0.0569)	BRL(<0.0565)	BRL(<0.0586)	BRL(<0.0565)	BRL(<0.0567)
Aroclor 1242	BRL(<0.0514)	BRL(<0.0508)	BRL(<0.0505)	BRL(<0.0514)	BRL(<0.0581)	BRL(<0.0595)	BRL(<0.0567)	BRL(<0.0559)	BRL(<0.0569)	BRL(<0.0565)	BRL(<0.0586)	BRL(<0.0565)	BRL(<0.0567)
Aroclor 1248	BRL(<0.0342)	BRL(<0.0338)	BRL(<0.0337)	BRL(<0.0343)	BRL(<0.0388)	BRL(<0.0397)	BRL(<0.0378)	BRL(<0.0372)	BRL(<0.038)	BRL(<0.0377)	BRL(<0.0391)	BRL(<0.0377)	BRL(<0.0378)
Aroclor 1254	BRL(<0.0514)	BRL(<0.0508)	BRL(<0.0505)	BRL(<0.0514)	BRL(<0.0581)	BRL(<0.0595)	BRL(<0.0567)	BRL(<0.0559)	BRL(<0.0569)	BRL(<0.0565)	BRL(<0.0586)	BRL(<0.0565)	BRL(<0.0567)
Aroclor 1260	BRL(<0.0342)	0.0609	BRL(<0.0337)	0.0526	0.0556	BRL(<0.0397)	0.181	0.524	0.148	0.0564	BRL(<0.0391)	0.0679	0.184
Aroclor 1262	BRL(<0.0171)	BRL(<0.0169)	BRL(<0.0168)	BRL(<0.0172)	BRL(<0.0194)	BRL(<0.0198)	BRL(<0.0189)	BRL(<0.0186)	BRL(<0.019)	BRL(<0.0188)	BRL(<0.0195)	BRL(<0.0188)	BRL(<0.0189)
Aroclor 1268	BRL(<0.0171)	BRL(<0.0169)	BRL(<0.0168)	BRL(<0.0172)	BRL(<0.0194)	BRL(<0.0198)	BRL(<0.0189)	BRL(<0.0186)	BRL(<0.019)	BRL(<0.0188)	BRL(<0.0195)	BRL(<0.0188)	BRL(<0.0189)

SAMPLE ID	CMU-H-7	CMU-H-8	CMU-I-1	CMU-I-2	CMU-I-3	CMU-I-4	CMU-I-5	CMU-I-6	CMU-I-7	CMU-I-8	CMU-I-8_DUP	CMU-J-1	CMU-J-2
SAMPLING DATE	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012
LAB SAMPLE ID	L1212504-02	L1212504-03	L1212504-04	L1212504-05	L1212504-06	L1212504-07	L1212504-08	L1212504-09	L1212504-10	L1212504-11	L1212504-13	L1212504-14	L1212504-15
SAMPLE MATRIX	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Polychlorinated Biphenyls (PCBs)													
Aroclor 1016	BRL(<0.0559)	BRL(<0.0558)	BRL(<0.0593)	BRL(<0.0589)	BRL(<0.0587)	BRL(<0.0587)	BRL(<0.0577)	BRL(<0.0567)	BRL(<0.0567)	BRL(<0.0576)	BRL(<0.0571)	BRL(<0.0566)	BRL(<0.0579)
Aroclor 1221	BRL(<0.0559)	BRL(<0.0558)	BRL(<0.0593)	BRL(<0.0589)	BRL(<0.0587)	BRL(<0.0587)	BRL(<0.0577)	BRL(<0.0567)	BRL(<0.0567)	BRL(<0.0576)	BRL(<0.0571)	BRL(<0.0566)	BRL(<0.0579)
Aroclor 1232	BRL(<0.0559)	BRL(<0.0558)	BRL(<0.0593)	BRL(<0.0589)	BRL(<0.0587)	BRL(<0.0587)	BRL(<0.0577)	BRL(<0.0567)	BRL(<0.0567)	BRL(<0.0576)	BRL(<0.0571)	BRL(<0.0566)	BRL(<0.0579)
Aroclor 1242	BRL(<0.0559)	BRL(<0.0558)	BRL(<0.0593)	BRL(<0.0589)	BRL(<0.0587)	BRL(<0.0587)	BRL(<0.0577)	BRL(<0.0567)	BRL(<0.0567)	BRL(<0.0576)	BRL(<0.0571)	BRL(<0.0566)	BRL(<0.0579)
Aroclor 1248	BRL(<0.0372)	BRL(<0.0372)	BRL(<0.0395)	BRL(<0.0393)	BRL(<0.0391)	BRL(<0.0391)	BRL(<0.0385)	BRL(<0.0378)	BRL(<0.0378)	BRL(<0.0384)	BRL(<0.0381)	BRL(<0.0377)	BRL(<0.0386)
Aroclor 1254	BRL(<0.0559)	BRL(<0.0558)	BRL(<0.0593)	BRL(<0.0589)	BRL(<0.0587)	BRL(<0.0587)	BRL(<0.0577)	BRL(<0.0567)	BRL(<0.0567)	BRL(<0.0576)	BRL(<0.0571)	BRL(<0.0566)	BRL(<0.0579)
Aroclor 1260	0.0731	0.102	0.428	0.0754	0.107	0.103	0.04	0.0892	0.0575	0.1	0.112	0.449	0.5
Aroclor 1262	BRL(<0.0186)	BRL(<0.0186)	BRL(<0.0198)	BRL(<0.0196)	BRL(<0.0196)	BRL(<0.0196)	BRL(<0.0192)	BRL(<0.0189)	BRL(<0.0189)	BRL(<0.0192)	BRL(<0.019)	BRL(<0.0189)	BRL(<0.0193)
Aroclor 1268	BRL(<0.0186)	BRL(<0.0186)	BRL(<0.0198)	BRL(<0.0196)	BRL(<0.0196)	BRL(<0.0196)	BRL(<0.0192)	BRL(<0.0189)	BRL(<0.0189)	BRL(<0.0192)	BRL(<0.019)	BRL(<0.0189)	BRL(<0.0193)

TABLE 3 - Summary of 07.2012 Building Materials Analytical Results

SAMPLE ID	CMU-J-3	CMU-J-4	CMU-J-5	CMU-J-6	CMU-J-7	CMU-J-8	CMU-J-8_DUP	CRACK-1	CRACK-2	CRACK-3	CRACK-4	FLOOR 2-3	FLOOR 2-4	FLOOR-2-1 (CAULK)
SAMPLING DATE	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/13/2012	7/11/2012	7/13/2012	7/13/2012	7/13/2012	7/17/2012	7/17/2012	7/17/2012
LAB SAMPLE ID	L1212504-16	L1212504-17	L1212504-18	L1212504-19	L1212504-20	L1212504-21	L1212504-22	L1212310-10	L1212503-13	L1212504-12	L1212504-24	L1212650-04	L1212650-05	L1212650-02
SAMPLE MATRIX	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Caulking Material
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Polychlorinated Biphenyls (PCBs)														
Aroclor 1016	BRL(<0.057)	BRL(<0.0585)	BRL(<0.0582)	BRL(<0.0561)	BRL(<0.0574)	BRL(<0.0588)	BRL(<0.0584)	BRL(<0.0579)	BRL(<0.058)	BRL(<0.0587)	BRL(<0.0578)	BRL(<0.0522)	BRL(<0.0548)	BRL(<0.0585)
Aroclor 1221	BRL(<0.057)	BRL(<0.0585)	BRL(<0.0582)	BRL(<0.0561)	BRL(<0.0574)	BRL(<0.0588)	BRL(<0.0584)	BRL(<0.0579)	BRL(<0.058)	BRL(<0.0587)	BRL(<0.0578)	BRL(<0.0522)	BRL(<0.0548)	BRL(<0.0585)
Aroclor 1232	BRL(<0.057)	BRL(<0.0585)	BRL(<0.0582)	BRL(<0.0561)	BRL(<0.0574)	BRL(<0.0588)	BRL(<0.0584)	BRL(<0.0579)	BRL(<0.058)	BRL(<0.0587)	BRL(<0.0578)	BRL(<0.0522)	BRL(<0.0548)	BRL(<0.0585)
Aroclor 1242	BRL(<0.057)	BRL(<0.0585)	BRL(<0.0582)	BRL(<0.0561)	BRL(<0.0574)	BRL(<0.0588)	BRL(<0.0584)	BRL(<0.0579)	BRL(<0.058)	BRL(<0.0587)	BRL(<0.0578)	BRL(<0.0522)	BRL(<0.0548)	BRL(<0.0585)
Aroclor 1248	BRL(<0.038)	BRL(<0.039)	BRL(<0.0388)	BRL(<0.0374)	BRL(<0.0382)	BRL(<0.0392)	BRL(<0.0389)	BRL(<0.0386)	BRL(<0.0387)	BRL(<0.0391)	BRL(<0.0385)	BRL(<0.0348)	BRL(<0.0365)	BRL(<0.039)
Aroclor 1254	BRL(<0.057)	BRL(<0.0585)	BRL(<0.0582)	BRL(<0.0561)	BRL(<0.0574)	BRL(<0.0588)	BRL(<0.0584)	BRL(<0.0579)	0.224	BRL(<0.0587)	BRL(<0.0578)	BRL(<0.0522)	BRL(<0.0548)	BRL(<0.0585)
Aroclor 1260	0.0684	0.0603	0.0575	0.128	0.0914	0.0968	0.088	BRL(<0.0386)	0.368	0.0809	BRL(<0.0385)	0.114	0.336	1.52
Aroclor 1262	BRL(<0.019)	BRL(<0.0195)	BRL(<0.0194)	BRL(<0.0187)	BRL(<0.0191)	BRL(<0.0196)	BRL(<0.0194)	BRL(<0.0193)	BRL(<0.0194)	BRL(<0.0196)	BRL(<0.0193)	BRL(<0.0174)	BRL(<0.0182)	BRL(<0.0195)
Aroclor 1268	BRL(<0.019)	BRL(<0.0195)	BRL(<0.0194)	BRL(<0.0187)	BRL(<0.0191)	BRL(<0.0196)	BRL(<0.0194)	BRL(<0.0193)	BRL(<0.0194)	BRL(<0.0196)	BRL(<0.0193)	BRL(<0.0174)	BRL(<0.0182)	BRL(<0.0195)

SAMPLE ID	FLOOR-2-2 (CAULK)	WALL-1-1	WALL-1-2	WALL-1-3	WALL-1-4	WALL-3-1 (CAULK)	WALL-3-2 (CAULK)	WALL-3-3	WALL-3-4	WALL-4-1	WALL-4-2	WALL-4-3	WALL-4-4	WALL-4-4 (DUP)
SAMPLING DATE	7/17/2012	7/17/2012	7/17/2012	7/17/2012	7/17/2012	7/17/2012	7/17/2012	7/17/2012	7/17/2012	7/17/2012	7/17/2012	7/17/2012	7/17/2012	7/17/2012
LAB SAMPLE ID	L1212650-03	L1212650-11	L1212650-12	L1212650-13	L1212650-14	L1212650-15	L1212650-16	L1212650-17	L1212650-18	L1212650-06	L1212650-07	L1212650-08	L1212650-09	L1212650-10
SAMPLE MATRIX	Caulking Material	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Caulking Material	Caulking Material	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder	Concrete Powder
UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Polychlorinated Biphenyls (PCBs)														
Aroclor 1016	BRL(<0.0579)	BRL(<0.055)	BRL(<0.0516)	BRL(<0.113)	BRL(<0.058)	BRL(<1030)	BRL(<1040)	BRL(<0.0572)	BRL(<0.0586)	BRL(<0.0527)	BRL(<0.0516)	BRL(<0.051)	BRL(<0.0534)	BRL(<0.0535)
Aroclor 1221	BRL(<0.0579)	BRL(<0.055)	BRL(<0.0516)	BRL(<0.113)	BRL(<0.058)	BRL(<1030)	BRL(<1040)	BRL(<0.0572)	BRL(<0.0586)	BRL(<0.0527)	BRL(<0.0516)	BRL(<0.051)	BRL(<0.0534)	BRL(<0.0535)
Aroclor 1232	BRL(<0.0579)	BRL(<0.055)	BRL(<0.0516)	BRL(<0.113)	BRL(<0.058)	BRL(<1030)	BRL(<1040)	BRL(<0.0572)	BRL(<0.0586)	BRL(<0.0527)	BRL(<0.0516)	BRL(<0.051)	BRL(<0.0534)	BRL(<0.0535)
Aroclor 1242	BRL(<0.0579)	BRL(<0.055)	BRL(<0.0516)	BRL(<0.113)	BRL(<0.058)	BRL(<1030)	BRL(<1040)	BRL(<0.0572)	BRL(<0.0586)	BRL(<0.0527)	BRL(<0.0516)	BRL(<0.051)	BRL(<0.0534)	BRL(<0.0535)
Aroclor 1248	BRL(<0.0386)	BRL(<0.0367)	BRL(<0.0344)	BRL(<0.0753)	BRL(<0.0387)	BRL(<690)	BRL(<696)	BRL(<0.0382)	BRL(<0.0391)	BRL(<0.0351)	BRL(<0.0344)	BRL(<0.034)	BRL(<0.0356)	BRL(<0.0356)
Aroclor 1254	BRL(<0.0579)	BRL(<0.055)	BRL(<0.0516)	BRL(<0.113)	BRL(<0.058)	BRL(<1030)	BRL(<1040)	BRL(<0.0572)	0.922	BRL(<0.0527)	BRL(<0.0516)	BRL(<0.051)	BRL(<0.0534)	BRL(<0.0535)
Aroclor 1260	0.651	0.142	0.17	0.264	0.14	**18400**	**22500**	0.491	0.854	BRL(<0.0351)	BRL(<0.0344)	BRL(<0.034)	0.0558	BRL(<0.0356)
Aroclor 1262	BRL(<0.0193)	BRL(<0.0183)	BRL(<0.0172)	BRL(<0.0377)	BRL(<0.0193)	BRL(<345)	BRL(<348)	BRL(<0.0191)	BRL(<0.0195)	BRL(<0.0176)	BRL(<0.0172)	BRL(<0.017)	BRL(<0.0178)	BRL(<0.0178)
Aroclor 1268	BRL(<0.0193)	BRL(<0.0183)	BRL(<0.0172)	BRL(<0.0377)	BRL(<0.0193)	BRL(<345)	BRL(<348)	BRL(<0.0191)	BRL(<0.0195)	BRL(<0.0176)	BRL(<0.0172)	BRL(<0.017)	BRL(<0.0178)	BRL(<0.0178)

APPENDIX A – PHOTOGRAPHIC DOCUMENTATION

Photo 1

Photo depicts site structure, looking northeast.

Photo 2

Photo depicts southern side of site structure, looking northwest.

Photo 3

Photo depicts western side of site structure, looking northeast.

Photo 4

Photo depicts Nover-Armstrong personnel collecting samples at CMU Sampling Group F.

PHOTOGRAPHIC DOCUMENTATION

21 Water Street

Cambridge, Massachusetts

Photographs Documented 7.11.12 - 7.25.12

NAA File P2814

Photo 5

Photo depicts CMU Sampling Groups A (right) and B (left).

Photo 6

Photo depicts individual sample cluster CMU-A-8.

Photo 7

Photo depicts CMU Sampling Group C.

Photo 8

Photo depicts CMU Sampling Group D.

PHOTOGRAPHIC DOCUMENTATION

21 Water Street

Cambridge, Massachusetts

Photographs Documented 7.11.12 - 7.25.12

NAA File P2814

Photo 9

Photo depicts CMU Sampling Group E.

Photo 10

Photo depicts CMU Sampling Group F.

Photo 11

Photo depicts CMU Sampling Group G.

Photo 12

Photo depicts CMU Sampling Groups H (foreground), I (middle), and J (background).

PHOTOGRAPHIC DOCUMENTATION

21 Water Street

Cambridge, Massachusetts

Photographs Documented 7.11.12 - 7.25.12

NAA File P2814

Photo 13

Photo depicts sampling location CRACK-1, on the western side of the site structure.

Photo 14

Photo depicts sampling location CRACK-2, on the southern side of the site structure.

Photo 15

Photo depicts sampling location CRACK-3, on the northern side of the site structure.

Photo 16

Photo depicts sampling location CRACK-4, on the eastern side of the site structure.

PHOTOGRAPHIC DOCUMENTATION

21 Water Street

Cambridge, Massachusetts

Photographs Documented 7.11.12 - 7.25.12

NAA File P2814

Photo 17

Photo depicts sampling location WALL-1.

Photo 18

Photo depicts sampling location WALL-3.

Photo 19

Photo depicts sampling location WALL-4.

Photo 20

Photo depicts sampling location FLOOR-2.

PHOTOGRAPHIC DOCUMENTATION

21 Water Street

Cambridge, Massachusetts

Photographs Documented 7.11.12 - 7.25.12

NAA File P2814

APPENDIX B – FIELD SAMPLING LOGS

NOVER-ARMSTRONG ASSOC., INC. FIELD SAMPLING LOG

DATE: 7/11/12

SITE LOCATION: 21 Water St, Cambridge (MBTA)

PROJECT NUMBER: P2814

INITIALS OF PERSON MAKING LOG ENTRY: M.A.

WEATHER CONDITIONS: Sunny 90°F

NOVER-ARMSTRONG PERSONNEL ON-SITE: Matt Alger, Brian Lydon

ARRIVE: 7:00 am

DEPART: 2:30 pm

VISITORS: Marylou Armstrong (Nover-Armstrong) 1:45-2:30 pm

PURPOSE / SUMMARY OF TASK(S): Collect Concrete Masonry Unit (CMU) samples - PCB analysis

EQUIPMENT: Hammer Drill, scissor lift, fall protection PPE, ladder

NOTES/OBSERVATIONS: Lab method - EPA 8082 w/ Soxhlet Extraction

SAMPLE ID	SAMPLE TIME	SAMPLE MATRIX	SAMPLE TYPE	SAMPLER INITIALS	LAB ANALYSIS	FIELD SCREENING
EQUIP BLANK-1	8:45am	DI water	Grab	MA	PCBs	None
CMU-G-1	9:00am	Concrete Powder				
CMU-G-2	9:10am					
CMU-G-3	9:20am					
CMU-G-4	9:35am					
CMU-G-5	9:50am					
CMU-G-6	10:05am					
CMU-G-7	10:25am					
CMU-G-8	10:45am					
CRACK-1	11:30am					
CMU-F-1	12:15pm					
CMU-F-2	12:25pm					
CMU-F-3	1:15pm					
CMU-F-4	1:25pm					
CMU-F-5	12:40pm					
CMU-F-6	12:45pm					
CMU-F-7	1:35pm					
CMU-F-8	1:45pm					

NOVER-ARMSTRONG ASSOC., INC. FIELD SAMPLING LOG

DATE: 7/12/12

SITE LOCATION: 21 Water St, Cambridge (MBTA)

PROJECT NUMBER: P2814

INITIALS OF PERSON MAKING LOG ENTRY: M.A.

WEATHER CONDITIONS: Sunny 90°F

NOVER-ARMSTRONG PERSONNEL ON-SITE: Matt Alger, Brian Lydon

ARRIVE: 7:00 am

DEPART: 2:00 pm

VISITORS: Beck Staley (Kleinfelder) ~11:00-11:30 am

PURPOSE / SUMMARY OF TASK(S): Collect CMU samples for PCB analysis

EQUIPMENT: Hammer Drill, Scissor lift, fall protection, ladder, PPE

NOTES/OBSERVATIONS: Lab method - EPA 8082 w/ Soxhlet Extraction

SAMPLE ID	SAMPLE TIME	SAMPLE MATRIX	SAMPLE TYPE	SAMPLER INITIALS	LAB ANALYSIS	FIELD SCREENING
EQUIP BLANK2	7:55am	DI Water	Grab	MA	PCBs	None
CMU-A-1	8:00am	Concrete powder				
CMU-A-1_DUP	8:00am					
CMU-A-2	8:07am					
CMU-A-3	8:14am					
CMU-A-4	8:20am					
CMU-A-5	8:30am					
CMU-A-6	8:37am					
CMU-A-7	8:45am					
CMU-A-8	8:50am					
CMU-B-1	9:30am					
CMU-B-2	9:35am					
CMU-B-3	9:42am					
CMU-B-4	9:50am					
CMU-B-5	10:00am					
CMU-B-6	10:10am					
CMU-B-7	10:15am					
CMU-B-8	10:30am					
CMU-C-1	11:30am					
CMU-C-1_DUP	11:30am					
CMU-C-2	11:35am					
CMU-C-3	11:40am					
CMU-C-4	11:45am					
CMU-C-5	11:50am					
CMU-C-6	11:55am					
CMU-C-7	12:00pm					
CMU-C-8	12:05pm					

(cont.)

NOVER-ARMSTRONG ASSOC., INC. FIELD SAMPLING LOG

DATE: 7/12/12

SITE LOCATION: 21 Water St, Cambridge (MBTA)

PROJECT NUMBER: P2814

INITIALS OF PERSON MAKING LOG ENTRY: MA

WEATHER CONDITIONS: Sunny 90°F

NOVER-ARMSTRONG PERSONNEL ON-SITE: Matt Alger, Brian Lydon

ARRIVE: 7:00 am

DEPART: 2:00 pm

VISITORS: Beck Straley (Kleinfelder) ~11:00-11:30 am

PURPOSE / SUMMARY OF TASK(S): Collect CMU samples for PCB analysis

EQUIPMENT: Hammer Drill, scissor lift, fall protection, ladder PPE

NOTES/OBSERVATIONS: Lab Method - EPA 8082 w/ Soxhlet extraction

SAMPLE ID	SAMPLE TIME	SAMPLE MATRIX	SAMPLE TYPE	SAMPLER INITIALS	LAB ANALYSIS	FIELD SCREENING
EQUIPBLANK-3	2:00 pm	DI Water	Grab	MA	PCBs	None
CMU-D-5	1:00 pm	Concrete Powder				
CMU-D-6	1:05 pm					
CMU-E-5	1:10 pm					
CMU-E-6	1:15 pm					

NOVER-ARMSTRONG ASSOC., INC. FIELD SAMPLING LOG

DATE: 7/13/12

SITE LOCATION: 21 Water St, Cambridge (MBTA)

PROJECT NUMBER: P2814

INITIALS OF PERSON MAKING LOG ENTRY: MA

WEATHER CONDITIONS: Sunny 90°F

NOVER-ARMSTRONG PERSONNEL ON-SITE: Matt Alger, Brian Lydon, Colin Kelley

ARRIVE: 7:00 am

DEPART: 2:00 pm

VISITORS: Beck Straley (Kleinfelder) ~ 12:00 - 12:30 pm

PURPOSE / SUMMARY OF TASK(S): Collect CMU samples for PCB analysis

EQUIPMENT: Hammer drill, PPE, ladder

NOTES/OBSERVATIONS: Lab method EPA 8082 w/ Soxhlet Extraction

SAMPLE ID	SAMPLE TIME	SAMPLE MATRIX	SAMPLE TYPE	SAMPLER INITIALS	LAB ANALYSIS	FIELD SCREENING
CMU-D-1	8:00 am	Concrete powder	Grab	MA	PCBs	None
CMU-D-2	8:05 am					
CMU-D-3	8:10 am					
CMU-D-4	8:15 am					
CMU-D-7	8:20 am					
CMU-D-8	8:25 am					
CMU-E-1	8:40 am					
CMU-E-2	8:45 am					
CMU-E-3	8:50 am					
CMU-E-4	8:55 am					
CMU-E-7	9:00 am					
CMU-E-8	9:05 am					
CRACK-2	9:10 am					
CMU-H-1	9:30 am					
CMU-H-1_DUP	9:30 am					
CMU-H-2	9:40 am					
CMU-H-3	9:45 am					
CMU-H-4	9:50 am					
CMU-H-5	9:55 am					
CMU-H-6	10:00 am					
EQUIP BLANK-1	9:20 am	DI Water				
CMU-H-7	10:05 am	Concrete Powder				
CMU-H-8	10:10 am					
CMU-I-1	10:20 am					
CMU-I-2	10:25 am					
CMU-I-3	10:30 am					
CMU-I-4	10:35 am					

(cont.)

NOVER-ARMSTRONG ASSOC., INC. FIELD SAMPLING LOG

DATE: 7/13/12

SITE LOCATION: 21 Water St, Cambridge (MBTA)

PROJECT NUMBER: P2814

INITIALS OF PERSON MAKING LOG ENTRY: MA

WEATHER CONDITIONS: Sunny 90°F

NOVER-ARMSTRONG PERSONNEL ON-SITE: Matt Alger, Brian Lydon, Colin Kelley

ARRIVE: 7:00 am

DEPART: 2:00 pm

VISITORS: Beck Straley (Kleinfelder) ~12:00-12:30 pm

PURPOSE / SUMMARY OF TASK(S): Collect CMU samples for PCB analysis

EQUIPMENT: Hammer drill, PPE, ladder

NOTES/OBSERVATIONS: Lab method EPA 8082 w/ Soxhlet extraction

SAMPLE ID	SAMPLE TIME	SAMPLE MATRIX	SAMPLE TYPE	SAMPLER INITIALS	LAB ANALYSIS	FIELD SCREENING
CMU-I-5	10:40am	Concrete powder	Grab	MA	PCBs	None
CMU-I-6	10:45am					
CMU-I-7	10:50am					
CMU-I-8	10:55am					
CMU-I-8_DUP	10:55am					
CRACK-3	10:25am					
CMU-J-1	11:00am					
CMU-J-2	11:05am					
CMU-J-3	11:10am					
CMU-J-4	11:15am					
CMU-J-5	11:20am					
CMU-J-6	11:25am					
CMU-J-7	11:30am					
CMU-J-8	11:35am					
CMU-J-8_DUP	11:35am					
EQUIP BLANK-5	12:00pm	DI water				
CRACK-4	12:15pm	Concrete Powder				

NOVER-ARMSTRONG ASSOC., INC. FIELD SAMPLING LOG

DATE: 7-17-12

SITE LOCATION: 21 Water st, Cambridge MA (MBTA)

PROJECT NUMBER: P2514

INITIALS OF PERSON MAKING LOG ENTRY: BL

WEATHER CONDITIONS: Sunny, 90° +

NOVER-ARMSTRONG PERSONNEL ON-SITE: Brian Lydon, Marylee Armstrong, Colin Kelley

ARRIVE: 6:30

DEPART: 11:30

VISITORS: Beck Straley (Kleinfelder) 10:15-10:40

PURPOSE / SUMMARY OF TASK(S): collect floor & wall caulking sample and concrete sample for PCB analysis

EQUIPMENT: hammer drill, PPE, chisel, knife, sample scoop

NOTES/OBSERVATIONS: Lab method - EPA 8082 w/ Soxhlet Extraction

SAMPLE ID	SAMPLE TIME	SAMPLE MATRIX	SAMPLE TYPE	SAMPLER INITIALS	LAB ANALYSIS	FIELD SCREENING
Equipment Blank	740	aqueous	grab	BL	PCB's	None
Floor-2-1	740	caulk				
Floor-2-2	740	caulk				
Floor-2-3	750	concrete powder				
Floor-2-4	800					
Wall-4-1	820					
Wall-4-2	830					
Wall-4-3	840					
Wall-4-4	850					
Wall-4-4(DUP)	850					
Wall-1-1	910					
Wall-1-2	920					
Wall-1-3	930					
Wall-1-4	940					
Wall-3-1	1000	caulk				
Wall-3-2	1010	caulk				
Wall-3-3	1020	concrete/caulk				
Wall-3-4	1030	"				

APPENDIX C – ALPHA ANALYTICAL REPORTS

ANALYTICAL REPORT

Lab Number:	L1212310
Client:	Nover-Armstrong Associates 124 Main Street Unit 2GG Carver, MA 02330
ATTN:	Matt Alger
Phone:	(508) 866-8383
Project Name:	MBTA/LECHMERE
Project Number:	P2814
Report Date:	07/18/12

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), USDA (Permit #P-330-11-00240), NC (666), TX (T104704476), DOD (L2217), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L1212310-01	EQUIP BLANK -1	CAMBRIDGE	07/11/12 08:45
L1212310-02	CMU-G-1	CAMBRIDGE	07/11/12 09:00
L1212310-03	CMU-G-2	CAMBRIDGE	07/11/12 09:10
L1212310-04	CMU-G-3	CAMBRIDGE	07/11/12 09:20
L1212310-05	CMU-G-4	CAMBRIDGE	07/11/12 09:35
L1212310-06	CMU-G-5	CAMBRIDGE	07/11/12 09:50
L1212310-07	CMU-G-6	CAMBRIDGE	07/11/12 10:05
L1212310-08	CMU-G-7	CAMBRIDGE	07/11/12 10:25
L1212310-09	CMU-G-8	CAMBRIDGE	07/11/12 10:45
L1212310-10	CRACK-1	CAMBRIDGE	07/11/12 11:30
L1212310-11	CMU-F-1	CAMBRIDGE	07/11/12 12:15
L1212310-12	CMU-F-2	CAMBRIDGE	07/11/12 12:25
L1212310-13	CMU-F-3	CAMBRIDGE	07/11/12 13:15
L1212310-14	CMU-F-4	CAMBRIDGE	07/11/12 13:25
L1212310-15	CMU-F-5	CAMBRIDGE	07/11/12 12:40
L1212310-16	CMU-F-6	CAMBRIDGE	07/11/12 12:45
L1212310-17	CMU-F-7	CAMBRIDGE	07/11/12 13:35
L1212310-18	CMU-F-8	CAMBRIDGE	07/11/12 13:45

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

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

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name: MBTA/LECHMERE **Lab Number:** L1212310
Project Number: P2814 **Report Date:** 07/18/12

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Performance criteria for CAM and RCP methods allow for some LCS compound failures to occur and still be within method compliance. In these instances, the specific failures are not narrated but are noted in the associated QC table. This information is also incorporated in the Data Usability format for our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples free of charge for 30 days from the date the project is completed. After 30 days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: MBTA/LECHMERE **Lab Number:** L1212310
Project Number: P2814 **Report Date:** 07/18/12

Case Narrative (continued)

MCP Related Narratives

PCBs

In reference to question H:

The dual column RPDs for L1212310-07 and -08 are above the acceptance criteria for Aroclor 1260; however, no obvious column interferences are present. The higher of the two results are reported and qualified with a "P".

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Elizabeth Simmons

Title: Technical Director/Representative Date: 07/18/12

ORGANICS

PCBS

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-01	Date Collected:	07/11/12 08:45
Client ID:	EQUIP BLANK -1	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	97,8082	Extraction Date:	07/12/12 11:18
Analytical Date:	07/13/12 20:54	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/12/12
		Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/12/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/l	0.250	--	1
Aroclor 1221	ND		ug/l	0.250	--	1
Aroclor 1232	ND		ug/l	0.250	--	1
Aroclor 1242	ND		ug/l	0.250	--	1
Aroclor 1248	ND		ug/l	0.250	--	1
Aroclor 1254	ND		ug/l	0.250	--	1
Aroclor 1260	ND		ug/l	0.250	--	1
Aroclor 1262	ND		ug/l	0.250	--	1
Aroclor 1268	ND		ug/l	0.250	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	103		30-150
Decachlorobiphenyl	89		30-150
2,4,5,6-Tetrachloro-m-xylene	83		30-150
Decachlorobiphenyl	73		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-02	Date Collected:	07/11/12 09:00
Client ID:	CMU-G-1	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 21:51	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	52.1	--	1
Aroclor 1221	ND		ug/kg	52.1	--	1
Aroclor 1232	ND		ug/kg	52.1	--	1
Aroclor 1242	ND		ug/kg	52.1	--	1
Aroclor 1248	ND		ug/kg	34.7	--	1
Aroclor 1254	ND		ug/kg	52.1	--	1
Aroclor 1260	95.9		ug/kg	34.7	--	1
Aroclor 1262	ND		ug/kg	17.4	--	1
Aroclor 1268	ND		ug/kg	17.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	71		30-150
Decachlorobiphenyl	82		30-150
2,4,5,6-Tetrachloro-m-xylene	69		30-150
Decachlorobiphenyl	76		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-03	Date Collected:	07/11/12 09:10
Client ID:	CMU-G-2	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 22:06	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	54.8	--	1
Aroclor 1221	ND		ug/kg	54.8	--	1
Aroclor 1232	ND		ug/kg	54.8	--	1
Aroclor 1242	ND		ug/kg	54.8	--	1
Aroclor 1248	ND		ug/kg	36.6	--	1
Aroclor 1254	ND		ug/kg	54.8	--	1
Aroclor 1260	106		ug/kg	36.6	--	1
Aroclor 1262	ND		ug/kg	18.3	--	1
Aroclor 1268	ND		ug/kg	18.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	89		30-150
Decachlorobiphenyl	94		30-150
2,4,5,6-Tetrachloro-m-xylene	87		30-150
Decachlorobiphenyl	89		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-04	Date Collected:	07/11/12 09:20
Client ID:	CMU-G-3	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 22:22	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	51.4	--	1
Aroclor 1221	ND		ug/kg	51.4	--	1
Aroclor 1232	ND		ug/kg	51.4	--	1
Aroclor 1242	ND		ug/kg	51.4	--	1
Aroclor 1248	ND		ug/kg	34.2	--	1
Aroclor 1254	ND		ug/kg	51.4	--	1
Aroclor 1260	ND		ug/kg	34.2	--	1
Aroclor 1262	ND		ug/kg	17.1	--	1
Aroclor 1268	ND		ug/kg	17.1	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	81		30-150
Decachlorobiphenyl	96		30-150
2,4,5,6-Tetrachloro-m-xylene	78		30-150
Decachlorobiphenyl	94		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-05	Date Collected:	07/11/12 09:35
Client ID:	CMU-G-4	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 22:37	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	50.8	--	1
Aroclor 1221	ND		ug/kg	50.8	--	1
Aroclor 1232	ND		ug/kg	50.8	--	1
Aroclor 1242	ND		ug/kg	50.8	--	1
Aroclor 1248	ND		ug/kg	33.8	--	1
Aroclor 1254	ND		ug/kg	50.8	--	1
Aroclor 1260	60.9		ug/kg	33.8	--	1
Aroclor 1262	ND		ug/kg	16.9	--	1
Aroclor 1268	ND		ug/kg	16.9	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	88		30-150
Decachlorobiphenyl	101		30-150
2,4,5,6-Tetrachloro-m-xylene	84		30-150
Decachlorobiphenyl	92		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-06	Date Collected:	07/11/12 09:50
Client ID:	CMU-G-5	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 22:53	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	50.5	--	1
Aroclor 1221	ND		ug/kg	50.5	--	1
Aroclor 1232	ND		ug/kg	50.5	--	1
Aroclor 1242	ND		ug/kg	50.5	--	1
Aroclor 1248	ND		ug/kg	33.7	--	1
Aroclor 1254	ND		ug/kg	50.5	--	1
Aroclor 1260	ND		ug/kg	33.7	--	1
Aroclor 1262	ND		ug/kg	16.8	--	1
Aroclor 1268	ND		ug/kg	16.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	87		30-150
Decachlorobiphenyl	100		30-150
2,4,5,6-Tetrachloro-m-xylene	82		30-150
Decachlorobiphenyl	91		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-07	Date Collected:	07/11/12 10:05
Client ID:	CMU-G-6	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 23:08	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	51.4	--	1
Aroclor 1221	ND		ug/kg	51.4	--	1
Aroclor 1232	ND		ug/kg	51.4	--	1
Aroclor 1242	ND		ug/kg	51.4	--	1
Aroclor 1248	ND		ug/kg	34.3	--	1
Aroclor 1254	ND		ug/kg	51.4	--	1
Aroclor 1260	52.6	P	ug/kg	34.3	--	1
Aroclor 1262	ND		ug/kg	17.2	--	1
Aroclor 1268	ND		ug/kg	17.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	92		30-150
Decachlorobiphenyl	104		30-150
2,4,5,6-Tetrachloro-m-xylene	88		30-150
Decachlorobiphenyl	97		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-08	Date Collected:	07/11/12 10:25
Client ID:	CMU-G-7	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 23:23	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.1	--	1
Aroclor 1221	ND		ug/kg	58.1	--	1
Aroclor 1232	ND		ug/kg	58.1	--	1
Aroclor 1242	ND		ug/kg	58.1	--	1
Aroclor 1248	ND		ug/kg	38.8	--	1
Aroclor 1254	ND		ug/kg	58.1	--	1
Aroclor 1260	55.6	P	ug/kg	38.8	--	1
Aroclor 1262	ND		ug/kg	19.4	--	1
Aroclor 1268	ND		ug/kg	19.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	94		30-150
Decachlorobiphenyl	103		30-150
2,4,5,6-Tetrachloro-m-xylene	91		30-150
Decachlorobiphenyl	98		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-09	Date Collected:	07/11/12 10:45
Client ID:	CMU-G-8	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 02:20	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	59.5	--	1
Aroclor 1221	ND		ug/kg	59.5	--	1
Aroclor 1232	ND		ug/kg	59.5	--	1
Aroclor 1242	ND		ug/kg	59.5	--	1
Aroclor 1248	ND		ug/kg	39.7	--	1
Aroclor 1254	ND		ug/kg	59.5	--	1
Aroclor 1260	ND		ug/kg	39.7	--	1
Aroclor 1262	ND		ug/kg	19.8	--	1
Aroclor 1268	ND		ug/kg	19.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	91		30-150
Decachlorobiphenyl	96		30-150
2,4,5,6-Tetrachloro-m-xylene	86		30-150
Decachlorobiphenyl	91		30-150

Project Name: MBTA/LECHMERE
Project Number: P2814
Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-10	Date Collected:	07/11/12 11:30
Client ID:	CRACK-1	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 02:34	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.9	--	1
Aroclor 1221	ND		ug/kg	57.9	--	1
Aroclor 1232	ND		ug/kg	57.9	--	1
Aroclor 1242	ND		ug/kg	57.9	--	1
Aroclor 1248	ND		ug/kg	38.6	--	1
Aroclor 1254	ND		ug/kg	57.9	--	1
Aroclor 1260	ND		ug/kg	38.6	--	1
Aroclor 1262	ND		ug/kg	19.3	--	1
Aroclor 1268	ND		ug/kg	19.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	85		30-150
Decachlorobiphenyl	127		30-150
2,4,5,6-Tetrachloro-m-xylene	84		30-150
Decachlorobiphenyl	104		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-11	Date Collected:	07/11/12 12:15
Client ID:	CMU-F-1	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 02:47	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	54.9	--	1
Aroclor 1221	ND		ug/kg	54.9	--	1
Aroclor 1232	ND		ug/kg	54.9	--	1
Aroclor 1242	ND		ug/kg	54.9	--	1
Aroclor 1248	ND		ug/kg	36.6	--	1
Aroclor 1254	ND		ug/kg	54.9	--	1
Aroclor 1260	84.2		ug/kg	36.6	--	1
Aroclor 1262	ND		ug/kg	18.3	--	1
Aroclor 1268	ND		ug/kg	18.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	96		30-150
Decachlorobiphenyl	98		30-150
2,4,5,6-Tetrachloro-m-xylene	91		30-150
Decachlorobiphenyl	93		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-12	Date Collected:	07/11/12 12:25
Client ID:	CMU-F-2	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 03:00	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.0	--	1
Aroclor 1221	ND		ug/kg	56.0	--	1
Aroclor 1232	ND		ug/kg	56.0	--	1
Aroclor 1242	ND		ug/kg	56.0	--	1
Aroclor 1248	ND		ug/kg	37.3	--	1
Aroclor 1254	ND		ug/kg	56.0	--	1
Aroclor 1260	ND		ug/kg	37.3	--	1
Aroclor 1262	ND		ug/kg	18.6	--	1
Aroclor 1268	ND		ug/kg	18.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	81		30-150
Decachlorobiphenyl	95		30-150
2,4,5,6-Tetrachloro-m-xylene	79		30-150
Decachlorobiphenyl	90		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-13	Date Collected:	07/11/12 13:15
Client ID:	CMU-F-3	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 03:14	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	53.5	--	1
Aroclor 1221	ND		ug/kg	53.5	--	1
Aroclor 1232	ND		ug/kg	53.5	--	1
Aroclor 1242	ND		ug/kg	53.5	--	1
Aroclor 1248	ND		ug/kg	35.6	--	1
Aroclor 1254	ND		ug/kg	53.5	--	1
Aroclor 1260	57.2		ug/kg	35.6	--	1
Aroclor 1262	ND		ug/kg	17.8	--	1
Aroclor 1268	ND		ug/kg	17.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	75		30-150
Decachlorobiphenyl	90		30-150
2,4,5,6-Tetrachloro-m-xylene	72		30-150
Decachlorobiphenyl	85		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-14	Date Collected:	07/11/12 13:25
Client ID:	CMU-F-4	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 03:27	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.9	--	1
Aroclor 1221	ND		ug/kg	57.9	--	1
Aroclor 1232	ND		ug/kg	57.9	--	1
Aroclor 1242	ND		ug/kg	57.9	--	1
Aroclor 1248	ND		ug/kg	38.6	--	1
Aroclor 1254	ND		ug/kg	57.9	--	1
Aroclor 1260	57.4		ug/kg	38.6	--	1
Aroclor 1262	ND		ug/kg	19.3	--	1
Aroclor 1268	ND		ug/kg	19.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	91		30-150
Decachlorobiphenyl	95		30-150
2,4,5,6-Tetrachloro-m-xylene	87		30-150
Decachlorobiphenyl	91		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-15	Date Collected:	07/11/12 12:40
Client ID:	CMU-F-5	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 03:40	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	54.6	--	1
Aroclor 1221	ND		ug/kg	54.6	--	1
Aroclor 1232	ND		ug/kg	54.6	--	1
Aroclor 1242	ND		ug/kg	54.6	--	1
Aroclor 1248	ND		ug/kg	36.4	--	1
Aroclor 1254	ND		ug/kg	54.6	--	1
Aroclor 1260	ND		ug/kg	36.4	--	1
Aroclor 1262	ND		ug/kg	18.2	--	1
Aroclor 1268	ND		ug/kg	18.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	96		30-150
Decachlorobiphenyl	97		30-150
2,4,5,6-Tetrachloro-m-xylene	92		30-150
Decachlorobiphenyl	92		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-16	Date Collected:	07/11/12 12:45
Client ID:	CMU-F-6	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 03:53	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	50.5	--	1
Aroclor 1221	ND		ug/kg	50.5	--	1
Aroclor 1232	ND		ug/kg	50.5	--	1
Aroclor 1242	ND		ug/kg	50.5	--	1
Aroclor 1248	ND		ug/kg	33.7	--	1
Aroclor 1254	ND		ug/kg	50.5	--	1
Aroclor 1260	ND		ug/kg	33.7	--	1
Aroclor 1262	ND		ug/kg	16.8	--	1
Aroclor 1268	ND		ug/kg	16.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	97		30-150
Decachlorobiphenyl	100		30-150
2,4,5,6-Tetrachloro-m-xylene	92		30-150
Decachlorobiphenyl	93		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-17	Date Collected:	07/11/12 13:35
Client ID:	CMU-F-7	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 04:07	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.3	--	1
Aroclor 1221	ND		ug/kg	56.3	--	1
Aroclor 1232	ND		ug/kg	56.3	--	1
Aroclor 1242	ND		ug/kg	56.3	--	1
Aroclor 1248	ND		ug/kg	37.5	--	1
Aroclor 1254	ND		ug/kg	56.3	--	1
Aroclor 1260	ND		ug/kg	37.5	--	1
Aroclor 1262	ND		ug/kg	18.8	--	1
Aroclor 1268	ND		ug/kg	18.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	88		30-150
Decachlorobiphenyl	102		30-150
2,4,5,6-Tetrachloro-m-xylene	83		30-150
Decachlorobiphenyl	93		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

SAMPLE RESULTS

Lab ID:	L1212310-18	Date Collected:	07/11/12 13:45
Client ID:	CMU-F-8	Date Received:	07/11/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/12/12 20:00
Analytical Date:	07/17/12 04:20	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	51.1	--	1
Aroclor 1221	ND		ug/kg	51.1	--	1
Aroclor 1232	ND		ug/kg	51.1	--	1
Aroclor 1242	ND		ug/kg	51.1	--	1
Aroclor 1248	ND		ug/kg	34.1	--	1
Aroclor 1254	ND		ug/kg	51.1	--	1
Aroclor 1260	ND		ug/kg	34.1	--	1
Aroclor 1262	ND		ug/kg	17.0	--	1
Aroclor 1268	ND		ug/kg	17.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	101		30-150
2,4,5,6-Tetrachloro-m-xylene	86		30-150
Decachlorobiphenyl	93		30-150

Project Name: MBTA/LECHMERE

Project Number: P2814

Lab Number: L1212310

Report Date: 07/18/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/13/12 21:06
Analyst: BA

Extraction Method: EPA 3510C
Extraction Date: 07/12/12 11:18
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/12/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/12/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG547979-1					
Aroclor 1016	ND		ug/l	0.250	--
Aroclor 1221	ND		ug/l	0.250	--
Aroclor 1232	ND		ug/l	0.250	--
Aroclor 1242	ND		ug/l	0.250	--
Aroclor 1248	ND		ug/l	0.250	--
Aroclor 1254	ND		ug/l	0.250	--
Aroclor 1260	ND		ug/l	0.250	--
Aroclor 1262	ND		ug/l	0.250	--
Aroclor 1268	ND		ug/l	0.250	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	96		30-150
Decachlorobiphenyl	99		30-150
2,4,5,6-Tetrachloro-m-xylene	86		30-150
Decachlorobiphenyl	83		30-150

Project Name: MBTA/LECHMERE

Project Number: P2814

Lab Number: L1212310

Report Date: 07/18/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/17/12 23:38
Analyst: BA

Extraction Method: EPA 3540C
Extraction Date: 07/12/12 20:00
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/15/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/15/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 02-18 Batch: WG548114-1					
Aroclor 1016	ND		ug/kg	57.6	--
Aroclor 1221	ND		ug/kg	57.6	--
Aroclor 1232	ND		ug/kg	57.6	--
Aroclor 1242	ND		ug/kg	57.6	--
Aroclor 1248	ND		ug/kg	38.4	--
Aroclor 1254	ND		ug/kg	57.6	--
Aroclor 1260	ND		ug/kg	38.4	--
Aroclor 1262	ND		ug/kg	19.2	--
Aroclor 1268	ND		ug/kg	19.2	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	83		30-150
Decachlorobiphenyl	106		30-150
2,4,5,6-Tetrachloro-m-xylene	79		30-150
Decachlorobiphenyl	98		30-150

Lab Control Sample Analysis
Batch Quality Control

Project Name: MBTA/LECHMERE
Project Number: P2814
Lab Number: L1212310
Report Date: 07/18/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG547979-2 WG547979-3								
Aroclor 1016	91		94		40-140	3		20
Aroclor 1260	91		95		40-140	4		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	97		99		30-150
Decachlorobiphenyl	98		101		30-150
2,4,5,6-Tetrachloro-m-xylene	87		87		30-150
Decachlorobiphenyl	79		81		30-150

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 02-18 Batch: WG548114-2 WG548114-3								
Aroclor 1016	77		74		40-140	4		30
Aroclor 1260	82		81		40-140	1		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	98		91		30-150
Decachlorobiphenyl	108		101		30-150
2,4,5,6-Tetrachloro-m-xylene	93		87		30-150
Decachlorobiphenyl	100		94		30-150

INORGANICS
&
MISCELLANEOUS

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-02
Client ID: CMU-G-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 09:00
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-03
Client ID: CMU-G-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 09:10
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-04
Client ID: CMU-G-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 09:20
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-05
Client ID: CMU-G-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 09:35
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-06
Client ID: CMU-G-5
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 09:50
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-07
Client ID: CMU-G-6
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 10:05
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-08
Client ID: CMU-G-7
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 10:25
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-09
Client ID: CMU-G-8
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 10:45
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-10
Client ID: CRACK-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 11:30
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-11
Client ID: CMU-F-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 12:15
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-12
Client ID: CMU-F-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 12:25
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-13
Client ID: CMU-F-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 13:15
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-14
Client ID: CMU-F-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 13:25
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-15
Client ID: CMU-F-5
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 12:40
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-16
Client ID: CMU-F-6
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 12:45
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-17
Client ID: CMU-F-7
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 13:35
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

SAMPLE RESULTS

Lab ID: L1212310-18
Client ID: CMU-F-8
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/11/12 13:45
Date Received: 07/11/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/12/12 20:45	30,2540G	RD

Lab Duplicate Analysis
Batch Quality Control

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02-18 QC Batch ID: WG548130-1 QC Sample: L1212310-02 Client ID: CMU-G-1						
Solids, Total	100	100	%	0		20

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal

Cooler	
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1212310-01A	Amber 1000ml unpreserved	A	N/A	3.3	Y	Absent	MCP-8082-10(365)
L1212310-01B	Amber 1000ml unpreserved	A	N/A	3.3	Y	Absent	MCP-8082-10(365)
L1212310-02A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-03A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-04A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-05A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-06A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-07A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-08A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-09A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-10A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-11A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-12A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-13A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-14A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-15A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-16A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-17A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212310-18A	Amber 250ml unpreserved	A	N/A	3.3	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)

*Values in parentheses indicate holding time in days

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212310
Report Date: 07/18/12

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)

Container Comments

L1212310-02A

L1212310-03A

L1212310-04A

L1212310-05A

L1212310-06A

L1212310-07A

L1212310-08A

L1212310-09A

L1212310-10A

L1212310-11A

L1212310-12A

L1212310-13A

L1212310-14A

L1212310-15A

L1212310-16A

L1212310-17A

L1212310-18A

*Values in parentheses indicate holding time in days

Project Name:	MBTA/LECHMERE	**Lab Number:**	L1212310
Project Number:	P2814	**Report Date:**	07/18/12

GLOSSARY

Acronyms

EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NI	- Not Ignitable.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit.
C	- Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
D	- Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
E	- Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
G	- The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.
H	- The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
I	- The RPD between the results for the two columns exceeds the method-specified criteria; however, the lower value has been reported due to obvious interference.
M	- Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
NJ	- Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

Report Format: Data Usability Report

Project Name: MBTA/LECHMERE **Lab Number:** L1212310

Project Number: P2814 **Report Date:** 07/18/12

Data Qualifiers

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name: MBTA/LECHMERE **Lab Number:** L1212310
Project Number: P2814 **Report Date:** 07/18/12

REFERENCES

30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certificate/Approval Program Summary

Last revised May 11, 2012 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. ***NELAP Accredited Solid Waste/Soil.***

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP) 504.1, Ethylene Dibromide (EDB) 504.1, 1,4-Dioxane (Mod 8270). Microbiology Parameters: Total Coliform-MF mEndo (SM9222B), Total Coliform – Colilert (SM9223 P/A), E. Coli. – Colilert (SM9223 P/A), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D, Fecal Coliform-EC Medium 9221E).

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, O-Phosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics, TPH (HEM/SGT), Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH. Microbiology Parameters: Total Coliform – MF mEndo (SM9222B), Total Coliform – MTF (SM9221B), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform – A-1 Broth (SM9221E), Enterolert, E.Coli 9223.

Solid Waste/Soil (Inorganic Parameters: pH, Sulfide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), SPLP Leach (1312 metals only), Reactivity. Organic Parameters: PCBs, PCBs in Oil, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH, Dicamba, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Dalapon, Volatile Organics, Acid Extractables (Phenols), Benzidines, Phthalates, Nitrosamines, Nitroaromatics & Cyclic Ketones, PAHs, Haloethers, Chlorinated Hydrocarbons.)

Maine Department of Human Services Certificate/Lab ID: 2009024.
Drinking Water (Inorganic Parameters: SM9215B, 9222D, 9223B, EPA 180.1, 353.2, SM2130B, 2320B, 2540C, 4500Cl-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H+B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1, EPA 300.0. Organic Parameters: 504.1, 524.2.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, SM2320B, 2510B, 2540C, 2540D, 426C, 4500Cl-D, 4500Cl-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NO3-F, 4500P-B, 4500P-E, 5210B, 5220D, 5310C, 9010B, 9040B, 9030B, 7470A, 7196A, 2340B, EPA 200.7, 6010B, 200.8, 6020, 245.1, 1311, 1312, 3005A, Enterolert, 9223D, 9222D. Organic Parameters: 608, 624, 625, 8081A, 8082, 8330, 8151A, 8260B, 8270C, 3510C, 3630C, 5030B, ME-DRO, ME-GRO, MA-EPH, MA-VPH.)

Solid Waste/Soil (Inorganic Parameters: 9010B, 9012A, 9014A, 9030B, 9040B, 9045C, 6010B, 7471A, 7196A, 9050A, 1010, 1030, 9065, 1311, 1312, 3005A, 3050B. Organic Parameters: ME-DRO, ME-GRO, MA-EPH, MA-VPH, 8260B, 8270C, 8330, 8151A, 8081A, 8082, 3540C, 3546, 3580A, 3630C, 5030B, 5035.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.
*Drinking Water (*Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl) (EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Fluoride, Sulfate); (EPA 353.2 for: Nitrate-N, Nitrite-N); (SM4500NO3-F for: Nitrate-N and Nitrite-N); 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, 2320B, SM2540C, SM4500H-B. Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics); (504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), EPA 332. Microbiology Parameters: SM9215B; ENZ. SUB. SM9223; ColilertQT SM9223B; MF-SM9222D.)

*Non-Potable Water (*Inorganic Parameters:, (EPA 200.8 for: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn); (EPA 200.7 for: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn); 245.1, SM4500H,B, EPA 120.1,

SM2510B, 2540C, 2340B, 2320B, 4500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia-N), LACHAT 10-107-06-1-B for Ammonia-N, SM4500NO3-F, 353.2 for Nitrate-N, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 5310C, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.
Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics),(608 for: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT,Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs-Water), (EPA 625 for SVOC Acid Extractables and SVOC Base/Neutral Extractables), 600/4-81-045-PCB-Oil. Microbiology Parameters: (ColilertQT SM9223B; Enterolert-QT: SM9222D-MF.)

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM 9222B, 9223B, 9215B, EPA 200.7, 200.8, 245.2, 300.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 332.0. Organic Parameters: 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 3005A, 200.7, 200.8, 245.1, 245.2, SW-846 6010B, 6010C, 6020, 6020A, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 350.2, 351.1, 353.2, 410.4, 420.1, 426C, 1664A, SW-846 9010B, 9030B, 9040B, SM426C, SM2120B, 2310B, 2320B, 2540B, 2540D, 4500H+B, 4500CL-E, 4500CN-E, 4500NH3-H, 4500NO3-F, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 5220D, 2510B, 2540C, 4500F-C, 5310C, 5540C, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D. Organic Parameters: SW-846 3510C, 3630C, 5030B, 8260B, 8270C, 8270D, 8330, EPA 624, 625, 608, SW-846 8082, 8081A, 8081B, 8151A.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 6010C, 7196A, 7471A, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040B, 9045C, 9050, 9065,1311, 1312, 3005A, 3050B, 3060A. Organic Parameters: SW-846 3540C, 3546, 3550B, 3580A, 3630C, 5030B, 5035, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330, 8151A, 8015B, 8082, 8082A, 8081A, 8081B.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9223B, 9215B, 4500CN-CE, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 200.8, 245.2, 2540C, SM2120B, 2320B, 2510B, 5310C, SM4500H-B. Organic Parameters: EPA 332, 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500Cl-E, EPA 300.0, SM2120B, 2340B, SM4500F-BC, EPA 200.7, 200.8, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM510ABC, SM4500P-B5+E, 2540B, 2540C, 2540D, 2540G, EPA 120.1, SM2510B, SM15 426C, 9222D, 9221B, 9221C, 9221E, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, 350.2, SW-846 1312, 7470A, 5540C, SM4500H-B, 4500SO3-B, SM3500Cr-D, 4500CN-CE, EPA 245.1, 245.2, SW-846 9040B, 3005A, 3015, EPA 6010B, 6010C, 6020, 6020A, 7196A, 3060A, SW-846 9010B, 9030B. Organic Parameters: SW-846 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3510C, EPA 608, 624, 625, SW-846 3630C, 5030B, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 1,4-Dioxane by NJ Modified 8270, 8015B, NJ OQA-QAM-025 Rev.7, NJ EPH.)

Solid & Chemical Materials (Inorganic Parameters: SW-846, 6010B, 6010C,6020, 6020A, 7196A, 3060A, 9010B, 9030B, 1010, 1030, 1311, 1312, 3005A, 3050B, 7471A, 7471B, 9014, 9012A, 9040B, 9045C, 9050A, 9065. Organic Parameters: SW-846 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3540C, 3546, 3580A, 3630C, 5030B, 5035L, 5035H, NJ OQA-QAM-025 Rev.7, NJ EPH.)

New York Department of Health Certificate/Lab ID: 11148. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9223B, 9222B, 9215B, EPA 200.8, 200.7, 245.2, SM5310C, EPA 332.0, SM2320B, EPA 300.0, SM2120B, 4500CN-E, 4500F-C, 4500NO3-F, 2540C, SM 2510B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222B, 9215B, 5210B, 5310C, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, SM4500CL-E, 4500F-C, SM15 426C, EPA 350.1, SM4500NH3-BH, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, SM4500-NO3-F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6010C, 6020, 6020A, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, LACHAT 10-204-00-1-A, 4500CN-CE, EPA 1664A, EPA 420.1, SM14 510C, EPA 120.1, SM2510B, SM4500S-D, SM5540C, EPA 3005A, 3015, 9010B, 9030B. Organic Parameters: EPA 624, 8260B, 8270C, 8270D, 625, 608, 8081A, 8081B, 8151A, 8330, 8082, 8082A, EPA 3510C, 5030B.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010, 1030, EPA 6010B, 6010C, 7196A, 7471A, 7471B, 9012A, 9014, 9065, 9050A, EPA 1311, 1312, 3005A, 3050B, 9010B, 9030B. Organic Parameters: EPA 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8015B, 8015C, 8081A, 8081B, 8151A, 8330, 8082 8082A, 3540C, 3546, 3580, 3580A, 5030B, 5035.)

North Carolina Department of the Environment and Natural Resources Certificate/Lab ID : 666. Organic Parameters: MA-EPH, MA-VPH.

Drinking Water Program Certificate/Lab ID: 25700. (Inorganic Parameters: Chloride EPA 300.0. Organic Parameters: 524.2)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. ***NELAP Accredited.***
Drinking Water (Organic Parameters: EPA 524.2, 504.1)

Non-Potable Water (Inorganic Parameters: EPA 1312, 3005A, 200.7, 410.4, 1664A, SM2540D, 5210B, 5220D, 4500-P,BE. Organic Parameters: EPA 3510C, 3630C, 5030B, 625, 624, 608, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330)

Solid & Hazardous Waste (Inorganic Parameters: EPA 350.1, 1010, 1030, 1311, 1312, 3050B, 3060A, 6010B, 6010C, 7196A, 7471A, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065, SM 4500NH3-H. Organic Parameters: 3540C, 3546, 3580A, 3630C, 5035, 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. ***NELAP Accredited via NY-DOH.***
Refer to MA-DEP Certificate for Potable and Non-Potable Water.
Refer to NJ-DEP Certificate for Potable and Non-Potable Water.

Texas Commisson on Environmental Quality Certificate/Lab ID: T104704476-09-1. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664, 200.7, 200.8, 245.1, 245.2, 300.0, 350.1, 351.1, 353.2, 410.4, 420.1, 6010, 6020, 7196, 7470, 9040, SM 2120B, 2310B, 2320B, 2510B, 2540B, 2540C, 2540D, 426C, 4500CL-E, 4500CN-E, 4500F-C, 4500H+B, 4500NH3-H, 4500NO2B, 4500P-E, 4500 S2¯D, 510C, 5210B, 5220D, 5310C, 5540C. Organic Parameters: EPA 608, 624, 625, 8081, 8082, 8151, 8260, 8270, 8330.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1311, 1312, 9012, 9014, 9040, 9045, 9050, 9065.)

Virginia Division of Consolidated Laboratory Services Certificate/Lab ID: 460195. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 3005A,3015,1312,6010B,6010C,SM4500S-D, SM4500-CN-CE, Lachat 10-204-00-1-X. Organic Parameters: EPA 8260B)

Solid & Hazardous Waste (Inorganic Parameters: EPA 3050B, 1311, 1312, 6010B, 6010C, 9030B, 9010B, 9012A, 9014. Organic Parameters: EPA 5035, 5030B, 8260B, 8015B, 8015C.)

Department of Defense, L-A-B Certificate/Lab ID: L2217.
Drinking Water (Inorganic Parameters: SM 4500H-B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: EPA 200.7, 200.8, 6010B, 6010C, 6020, 6020A, 245.1, 245.2, 7470A, 9040B, 9010B, 180.1. 300.0, 332.0, 6860, 353.2, 410.4, 9060, 1664A, SM 4500CN-E, 4500H-B, 4500NO3-F, 4500CL-D, 5220D, 5310C, 2130B, 2320B, 2540C, 3005A, 3015, 9010B, 9056. Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A, 8082, 8082A, 8081A, 8081B, 3510C, 5030B, MassDEP EPH, MassDEP VPH.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 200.7, 6010B, 6010C, 7471A, 6860, 1311, 1312, 3050B, 7196A, 9010B, 9012A, 9040B, 9045C, 3500-CR-D, 4500CN-CE, 2540G, Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A/B-prep, 8082, 8082A, 8081A, 8081B, 3540C, 3546, 3580A, 5035A, MassDEP EPH, MassDEP VPH.)

The following analytes are not included in our current NELAP/TNI Scope of Accreditation:
EPA 8260B: Freon-113, 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene. **EPA 8330A:** PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT. **EPA 8270C:** Methyl naphthalene, Dimethyl naphthalene, Total Methylnapthalenes, Total Dimethylnaphthalenes, 1,4-Diphenylhydrazine (Azobenzene). **EPA 625:** 4-Chloroaniline, 4-Methylphenol. Total Phosphorus in a soil matrix, Chloride in a soil matrix, TKN in a soil matrix, NO2 in a soil matrix, NO3 in a soil matrix, SO4 in a soil matrix. **EPA 9071:** Total Petroleum Hydrocarbons, Oil & Grease

CHAIN OF CUSTODY

PAGE 1 OF 2

Date Rec'd in Lab: 7·11·12

ALPHA Job #: L1212310 ~~L1212293~~

ALPHA ANALYTICAL — World Class Chemistry
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Project Information

Project Name: MBTA/Lechmere
Project Location: Cambridge
Project #: P2814
Project Manager: Matt Alger
ALPHA Quote #:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #: P2814

Client Information

Client: Nover-Armstrong Assoc.
Address: 124 Main St, Unit 2GG, Carver, MA 02330
Phone: 508-866-8383
Email: malger@noverarmstrong.com

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program TSCA Criteria

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: 7/15/12

Additional Project Information:

Use Soxhlet Extraction

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC: ☐ 8260 ☐ 624 ☐ 524.2	SVOC: ☐ ABN ☐ PAH	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	☒ PCB ☐ PEST Soxhlet	TPH: ☐ Quant Only ☐ Fingerprint						Sample Comments	TOTAL # BOTTLES
12310 1	EQUIP BLANK-1	7/11/12	8:45am	DI Water	MA							2								2
2	CMU-G-1		9:00am	Concrete Powder								1								1
3	CMU-G-2		9:10am									1								1
4	CMU-G-3		9:20am									1								1
5	CMU-G-4		9:35am									1								1
6	CMU-G-5		9:50am									1								1
7	CMU-G-6		10:05am									1								1
8	CMU-G-7		10:25am									1								1
9	CMU-G-8		10:45am									1								1
10	CRACK-1		11:30am									1								1
				Container Type								G/A								
				Preservative								A								

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7/11/12 3:40pm	[signature]	7/11/12 15:46

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab: 7-11-12

ALPHA Job #: L1212310

ALPHA ANALYTICAL
World Class Chemistry
8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: Nover-Armstrong Assoc.
Address: 124 Main St. Unit 206
Carver, MA 02330
Phone: 508-866-8383
Email: mdger@noverarmstrong.com

Project Information

Project Name: MBTA/Lechmere
Project Location: Cambridge
Project #: P2814
Project Manager: Matt Alger
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: 7/18/12

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #: P2814

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods
☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program TSCA Criteria

Additional Project Information:

Use Soxhlet Extraction

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☒ PCB ☐ PEST Soxhlet; TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	PCB	Sample Comments	TOTAL # BOTTLES
1230-11	CMU-F-1	7/11/12	12:15pm	Concrete Powder	MA	1		1
12	CMU-F-2		12:25pm			1		1
13	CMU-F-3		1:15pm			1		1
14	CMU-F-4		1:25pm			1		1
15	CMU-F-5		12:40pm			1		1
16	CMU-F-6		12:45pm			1		1
17	CMU-F-7		1:35pm			1		1
18	CMU-F-8		1:45pm			1		1
Container Type						G		
Preservative						A		

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7/11/12 3:40pm	[signature]	7/11/12

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

ANALYTICAL REPORT

Lab Number:	L1212415
Client:	Nover-Armstrong Associates 124 Main Street Unit 2GG Carver, MA 02330
ATTN:	Matt Alger
Phone:	(508) 866-8383
Project Name:	MBTA/LECHMERE
Project Number:	P2814
Report Date:	07/20/12

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), USDA (Permit #P-330-11-00240), NC (666), TX (T104704476), DOD (L2217), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L1212415-01	EQUIP BLANK-2	CAMBRIDGE	07/12/12 07:55
L1212415-02	CMU-A-1	CAMBRIDGE	07/12/12 08:00
L1212415-03	CMU-A-1_DUP	CAMBRIDGE	07/12/12 08:00
L1212415-04	CMU-A-2	CAMBRIDGE	07/12/12 08:07
L1212415-05	CMU-A-3	CAMBRIDGE	07/12/12 08:14
L1212415-06	CMU-A-4	CAMBRIDGE	07/12/12 08:20
L1212415-07	CMU-A-5	CAMBRIDGE	07/12/12 08:30
L1212415-08	CMU-A-6	CAMBRIDGE	07/12/12 08:37
L1212415-09	CMU-A-7	CAMBRIDGE	07/12/12 08:45
L1212415-10	CMU-A-8	CAMBRIDGE	07/12/12 08:50
L1212415-11	CMU-B-1	CAMBRIDGE	07/12/12 09:30
L1212415-12	CMU-B-2	CAMBRIDGE	07/12/12 09:35
L1212415-13	CMU-B-3	CAMBRIDGE	07/12/12 09:42
L1212415-14	CMU-B-4	CAMBRIDGE	07/12/12 09:50
L1212415-15	CMU-B-5	CAMBRIDGE	07/12/12 10:00
L1212415-16	CMU-B-6	CAMBRIDGE	07/12/12 10:10
L1212415-17	CMU-B-7	CAMBRIDGE	07/12/12 10:15
L1212415-18	CMU-B-8	CAMBRIDGE	07/12/12 10:30
L1212415-19	CMU-C-1	CAMBRIDGE	07/12/12 11:30
L1212415-20	CMU-C-1_DUP	CAMBRIDGE	07/12/12 11:30
L1212415-21	CMU-C-2	CAMBRIDGE	07/12/12 11:35
L1212415-22	CMU-C-3	CAMBRIDGE	07/12/12 11:40
L1212415-23	CMU-C-4	CAMBRIDGE	07/12/12 11:45
L1212415-24	CMU-C-5	CAMBRIDGE	07/12/12 11:50
L1212415-25	CMU-C-6	CAMBRIDGE	07/12/12 11:55
L1212415-26	CMU-C-7	CAMBRIDGE	07/12/12 12:00
L1212415-27	CMU-C-8	CAMBRIDGE	07/12/12 12:05
L1212415-28	EQUIP BLANK-3	CAMBRIDGE	07/12/12 14:00
L1212415-29	CMU-D-5	CAMBRIDGE	07/12/12 13:00
L1212415-30	CMU-D-6	CAMBRIDGE	07/12/12 13:05
L1212415-31	CMU-E-5	CAMBRIDGE	07/12/12 13:10

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L1212415-32	CMU-E-6	CAMBRIDGE	07/12/12 13:15

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

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

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	YES
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name: MBTA/LECHMERE **Lab Number:** L1212415
Project Number: P2814 **Report Date:** 07/20/12

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Performance criteria for CAM and RCP methods allow for some LCS compound failures to occur and still be within method compliance. In these instances, the specific failures are not narrated but are noted in the associated QC table. This information is also incorporated in the Data Usability format for our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples free of charge for 30 days from the date the project is completed. After 30 days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: MBTA/LECHMERE **Lab Number:** L1212415
Project Number: P2814 **Report Date:** 07/20/12

Case Narrative (continued)

MCP Related Narratives

Report Submission

All MCP required questions were answered with affirmative responses; therefore, there are no relevant protocol-specific QC and/or performance standard non-conformances to report.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative Date: 07/20/12

ORGANICS

PCBS

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-01	Date Collected:	07/12/12 07:55
Client ID:	EQUIP BLANK-2	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	97,8082	Extraction Date:	07/14/12 00:35
Analytical Date:	07/17/12 08:19	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
		Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/l	0.250	--	1
Aroclor 1221	ND		ug/l	0.250	--	1
Aroclor 1232	ND		ug/l	0.250	--	1
Aroclor 1242	ND		ug/l	0.250	--	1
Aroclor 1248	ND		ug/l	0.250	--	1
Aroclor 1254	ND		ug/l	0.250	--	1
Aroclor 1260	ND		ug/l	0.250	--	1
Aroclor 1262	ND		ug/l	0.250	--	1
Aroclor 1268	ND		ug/l	0.250	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	97		30-150
Decachlorobiphenyl	62		30-150
2,4,5,6-Tetrachloro-m-xylene	92		30-150
Decachlorobiphenyl	72		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-02	Date Collected:	07/12/12 08:00
Client ID:	CMU-A-1	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 16:25
Analytical Date:	07/18/12 18:38	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	51.4	--	1
Aroclor 1221	ND		ug/kg	51.4	--	1
Aroclor 1232	ND		ug/kg	51.4	--	1
Aroclor 1242	ND		ug/kg	51.4	--	1
Aroclor 1248	ND		ug/kg	34.2	--	1
Aroclor 1254	ND		ug/kg	51.4	--	1
Aroclor 1260	139		ug/kg	34.2	--	1
Aroclor 1262	ND		ug/kg	17.1	--	1
Aroclor 1268	ND		ug/kg	17.1	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	93		30-150
Decachlorobiphenyl	85		30-150
2,4,5,6-Tetrachloro-m-xylene	89		30-150
Decachlorobiphenyl	79		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-03	Date Collected:	07/12/12 08:00
Client ID:	CMU-A-1_DUP	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 16:25
Analytical Date:	07/18/12 18:52	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	52.7	--	1
Aroclor 1221	ND		ug/kg	52.7	--	1
Aroclor 1232	ND		ug/kg	52.7	--	1
Aroclor 1242	ND		ug/kg	52.7	--	1
Aroclor 1248	ND		ug/kg	35.1	--	1
Aroclor 1254	ND		ug/kg	52.7	--	1
Aroclor 1260	160		ug/kg	35.1	--	1
Aroclor 1262	ND		ug/kg	17.6	--	1
Aroclor 1268	ND		ug/kg	17.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	78		30-150
Decachlorobiphenyl	67		30-150
2,4,5,6-Tetrachloro-m-xylene	75		30-150
Decachlorobiphenyl	62		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-04	Date Collected:	07/12/12 08:07
Client ID:	CMU-A-2	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 19:05	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	50.9	--	1
Aroclor 1221	ND		ug/kg	50.9	--	1
Aroclor 1232	ND		ug/kg	50.9	--	1
Aroclor 1242	ND		ug/kg	50.9	--	1
Aroclor 1248	ND		ug/kg	34.0	--	1
Aroclor 1254	ND		ug/kg	50.9	--	1
Aroclor 1260	63.4		ug/kg	34.0	--	1
Aroclor 1262	ND		ug/kg	17.0	--	1
Aroclor 1268	ND		ug/kg	17.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	66		30-150
Decachlorobiphenyl	63		30-150
2,4,5,6-Tetrachloro-m-xylene	64		30-150
Decachlorobiphenyl	58		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-05	Date Collected:	07/12/12 08:14
Client ID:	CMU-A-3	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 19:18	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	53.7	--	1
Aroclor 1221	ND		ug/kg	53.7	--	1
Aroclor 1232	ND		ug/kg	53.7	--	1
Aroclor 1242	ND		ug/kg	53.7	--	1
Aroclor 1248	ND		ug/kg	35.8	--	1
Aroclor 1254	ND		ug/kg	53.7	--	1
Aroclor 1260	ND		ug/kg	35.8	--	1
Aroclor 1262	ND		ug/kg	17.9	--	1
Aroclor 1268	ND		ug/kg	17.9	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	84		30-150
Decachlorobiphenyl	103		30-150
2,4,5,6-Tetrachloro-m-xylene	82		30-150
Decachlorobiphenyl	98		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-06	Date Collected:	07/12/12 08:20
Client ID:	CMU-A-4	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 19:32	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	50.8	--	1
Aroclor 1221	ND		ug/kg	50.8	--	1
Aroclor 1232	ND		ug/kg	50.8	--	1
Aroclor 1242	ND		ug/kg	50.8	--	1
Aroclor 1248	ND		ug/kg	33.8	--	1
Aroclor 1254	ND		ug/kg	50.8	--	1
Aroclor 1260	ND		ug/kg	33.8	--	1
Aroclor 1262	ND		ug/kg	16.9	--	1
Aroclor 1268	ND		ug/kg	16.9	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	97		30-150
2,4,5,6-Tetrachloro-m-xylene	87		30-150
Decachlorobiphenyl	92		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-07	Date Collected:	07/12/12 08:30
Client ID:	CMU-A-5	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 19:45	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	55.4	--	1
Aroclor 1221	ND		ug/kg	55.4	--	1
Aroclor 1232	ND		ug/kg	55.4	--	1
Aroclor 1242	ND		ug/kg	55.4	--	1
Aroclor 1248	ND		ug/kg	37.0	--	1
Aroclor 1254	ND		ug/kg	55.4	--	1
Aroclor 1260	ND		ug/kg	37.0	--	1
Aroclor 1262	ND		ug/kg	18.5	--	1
Aroclor 1268	ND		ug/kg	18.5	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	41		30-150
Decachlorobiphenyl	41		30-150
2,4,5,6-Tetrachloro-m-xylene	42		30-150
Decachlorobiphenyl	39		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-08	Date Collected:	07/12/12 08:37
Client ID:	CMU-A-6	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 19:58	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.6	--	1
Aroclor 1221	ND		ug/kg	57.6	--	1
Aroclor 1232	ND		ug/kg	57.6	--	1
Aroclor 1242	ND		ug/kg	57.6	--	1
Aroclor 1248	ND		ug/kg	38.4	--	1
Aroclor 1254	ND		ug/kg	57.6	--	1
Aroclor 1260	ND		ug/kg	38.4	--	1
Aroclor 1262	ND		ug/kg	19.2	--	1
Aroclor 1268	ND		ug/kg	19.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	48		30-150
Decachlorobiphenyl	107		30-150
2,4,5,6-Tetrachloro-m-xylene	45		30-150
Decachlorobiphenyl	99		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-09	Date Collected:	07/12/12 08:45
Client ID:	CMU-A-7	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 21:04	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	52.2	--	1
Aroclor 1221	ND		ug/kg	52.2	--	1
Aroclor 1232	ND		ug/kg	52.2	--	1
Aroclor 1242	ND		ug/kg	52.2	--	1
Aroclor 1248	ND		ug/kg	34.8	--	1
Aroclor 1254	ND		ug/kg	52.2	--	1
Aroclor 1260	ND		ug/kg	34.8	--	1
Aroclor 1262	ND		ug/kg	17.4	--	1
Aroclor 1268	ND		ug/kg	17.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	71		30-150
Decachlorobiphenyl	76		30-150
2,4,5,6-Tetrachloro-m-xylene	68		30-150
Decachlorobiphenyl	71		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-10	Date Collected:	07/12/12 08:50
Client ID:	CMU-A-8	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 21:18	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.4	--	1
Aroclor 1221	ND		ug/kg	58.4	--	1
Aroclor 1232	ND		ug/kg	58.4	--	1
Aroclor 1242	ND		ug/kg	58.4	--	1
Aroclor 1248	ND		ug/kg	38.9	--	1
Aroclor 1254	ND		ug/kg	58.4	--	1
Aroclor 1262	ND		ug/kg	19.4	--	1
Aroclor 1268	ND		ug/kg	19.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	97		30-150
Decachlorobiphenyl	110		30-150
2,4,5,6-Tetrachloro-m-xylene	93		30-150
Decachlorobiphenyl	103		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-10	Date Collected:	07/12/12 08:50
Client ID:	CMU-A-8	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 21:18	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	ND		ug/kg	38.9	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	97		30-150
Decachlorobiphenyl	110		30-150
2,4,5,6-Tetrachloro-m-xylene	93		30-150
Decachlorobiphenyl	103		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-11	Date Collected:	07/12/12 09:30
Client ID:	CMU-B-1	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 21:31	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.2	--	1
Aroclor 1221	ND		ug/kg	56.2	--	1
Aroclor 1232	ND		ug/kg	56.2	--	1
Aroclor 1242	ND		ug/kg	56.2	--	1
Aroclor 1248	ND		ug/kg	37.4	--	1
Aroclor 1254	ND		ug/kg	56.2	--	1
Aroclor 1260	112		ug/kg	37.4	--	1
Aroclor 1262	ND		ug/kg	18.7	--	1
Aroclor 1268	ND		ug/kg	18.7	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	101		30-150
Decachlorobiphenyl	102		30-150
2,4,5,6-Tetrachloro-m-xylene	94		30-150
Decachlorobiphenyl	95		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-12	Date Collected:	07/12/12 09:35
Client ID:	CMU-B-2	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/19/12 11:52
Analytical Date:	07/20/12 10:33	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/20/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/20/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	48.7	--	1
Aroclor 1221	ND		ug/kg	48.7	--	1
Aroclor 1232	ND		ug/kg	48.7	--	1
Aroclor 1242	ND		ug/kg	48.7	--	1
Aroclor 1248	ND		ug/kg	32.5	--	1
Aroclor 1254	ND		ug/kg	48.7	--	1
Aroclor 1260	55.4		ug/kg	32.5	--	1
Aroclor 1262	ND		ug/kg	16.2	--	1
Aroclor 1268	ND		ug/kg	16.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	100		30-150
Decachlorobiphenyl	93		30-150
2,4,5,6-Tetrachloro-m-xylene	91		30-150
Decachlorobiphenyl	84		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-13	Date Collected:	07/12/12 09:42
Client ID:	CMU-B-3	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 21:58	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	51.1	--	1
Aroclor 1221	ND		ug/kg	51.1	--	1
Aroclor 1232	ND		ug/kg	51.1	--	1
Aroclor 1242	ND		ug/kg	51.1	--	1
Aroclor 1248	ND		ug/kg	34.1	--	1
Aroclor 1254	ND		ug/kg	51.1	--	1
Aroclor 1260	ND		ug/kg	34.1	--	1
Aroclor 1262	ND		ug/kg	17.0	--	1
Aroclor 1268	ND		ug/kg	17.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	84		30-150
Decachlorobiphenyl	94		30-150
2,4,5,6-Tetrachloro-m-xylene	78		30-150
Decachlorobiphenyl	84		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-14	Date Collected:	07/12/12 09:50
Client ID:	CMU-B-4	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 22:11	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	52.9	--	1
Aroclor 1221	ND		ug/kg	52.9	--	1
Aroclor 1232	ND		ug/kg	52.9	--	1
Aroclor 1242	ND		ug/kg	52.9	--	1
Aroclor 1248	ND		ug/kg	35.3	--	1
Aroclor 1254	ND		ug/kg	52.9	--	1
Aroclor 1260	ND		ug/kg	35.3	--	1
Aroclor 1262	ND		ug/kg	17.6	--	1
Aroclor 1268	ND		ug/kg	17.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	103		30-150
Decachlorobiphenyl	113		30-150
2,4,5,6-Tetrachloro-m-xylene	99		30-150
Decachlorobiphenyl	108		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-15	Date Collected:	07/12/12 10:00
Client ID:	CMU-B-5	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 22:24	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	55.0	--	1
Aroclor 1221	ND		ug/kg	55.0	--	1
Aroclor 1232	ND		ug/kg	55.0	--	1
Aroclor 1242	ND		ug/kg	55.0	--	1
Aroclor 1248	ND		ug/kg	36.7	--	1
Aroclor 1254	ND		ug/kg	55.0	--	1
Aroclor 1262	ND		ug/kg	18.3	--	1
Aroclor 1268	ND		ug/kg	18.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	112		30-150
Decachlorobiphenyl	112		30-150
2,4,5,6-Tetrachloro-m-xylene	109		30-150
Decachlorobiphenyl	110		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-15	Date Collected:	07/12/12 10:00
Client ID:	CMU-B-5	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 22:24	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	ND		ug/kg	36.7	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	112		30-150
Decachlorobiphenyl	112		30-150
2,4,5,6-Tetrachloro-m-xylene	109		30-150
Decachlorobiphenyl	110		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-16	Date Collected:	07/12/12 10:10
Client ID:	CMU-B-6	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 22:37	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	51.2	--	1
Aroclor 1221	ND		ug/kg	51.2	--	1
Aroclor 1232	ND		ug/kg	51.2	--	1
Aroclor 1242	ND		ug/kg	51.2	--	1
Aroclor 1248	ND		ug/kg	34.1	--	1
Aroclor 1254	ND		ug/kg	51.2	--	1
Aroclor 1260	ND		ug/kg	34.1	--	1
Aroclor 1262	ND		ug/kg	17.1	--	1
Aroclor 1268	ND		ug/kg	17.1	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	91		30-150
Decachlorobiphenyl	98		30-150
2,4,5,6-Tetrachloro-m-xylene	85		30-150
Decachlorobiphenyl	91		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-17	Date Collected:	07/12/12 10:15
Client ID:	CMU-B-7	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 22:50	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	55.9	--	1
Aroclor 1221	ND		ug/kg	55.9	--	1
Aroclor 1232	ND		ug/kg	55.9	--	1
Aroclor 1242	ND		ug/kg	55.9	--	1
Aroclor 1248	ND		ug/kg	37.2	--	1
Aroclor 1254	ND		ug/kg	55.9	--	1
Aroclor 1260	ND		ug/kg	37.2	--	1
Aroclor 1262	ND		ug/kg	18.6	--	1
Aroclor 1268	ND		ug/kg	18.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	113		30-150
Decachlorobiphenyl	118		30-150
2,4,5,6-Tetrachloro-m-xylene	106		30-150
Decachlorobiphenyl	109		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-18	Date Collected:	07/12/12 10:30
Client ID:	CMU-B-8	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 17:25
Analytical Date:	07/18/12 23:04	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	53.4	--	1
Aroclor 1221	ND		ug/kg	53.4	--	1
Aroclor 1232	ND		ug/kg	53.4	--	1
Aroclor 1242	ND		ug/kg	53.4	--	1
Aroclor 1248	ND		ug/kg	35.6	--	1
Aroclor 1254	ND		ug/kg	53.4	--	1
Aroclor 1260	ND		ug/kg	35.6	--	1
Aroclor 1262	ND		ug/kg	17.8	--	1
Aroclor 1268	ND		ug/kg	17.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	98		30-150
Decachlorobiphenyl	105		30-150
2,4,5,6-Tetrachloro-m-xylene	95		30-150
Decachlorobiphenyl	104		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-19	Date Collected:	07/12/12 11:30
Client ID:	CMU-C-1	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/19/12 11:52
Analytical Date:	07/20/12 10:46	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/20/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/20/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	54.0	--	1
Aroclor 1221	ND		ug/kg	54.0	--	1
Aroclor 1232	ND		ug/kg	54.0	--	1
Aroclor 1242	ND		ug/kg	54.0	--	1
Aroclor 1248	ND		ug/kg	36.0	--	1
Aroclor 1254	ND		ug/kg	54.0	--	1
Aroclor 1260	268		ug/kg	36.0	--	1
Aroclor 1262	ND		ug/kg	18.0	--	1
Aroclor 1268	ND		ug/kg	18.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	98		30-150
Decachlorobiphenyl	88		30-150
2,4,5,6-Tetrachloro-m-xylene	84		30-150
Decachlorobiphenyl	78		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-20	Date Collected:	07/12/12 11:30
Client ID:	CMU-C-1_DUP	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/18/12 16:39	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	52.0	--	1
Aroclor 1221	ND		ug/kg	52.0	--	1
Aroclor 1232	ND		ug/kg	52.0	--	1
Aroclor 1242	ND		ug/kg	52.0	--	1
Aroclor 1248	ND		ug/kg	34.7	--	1
Aroclor 1254	ND		ug/kg	52.0	--	1
Aroclor 1260	243		ug/kg	34.7	--	1
Aroclor 1262	ND		ug/kg	17.3	--	1
Aroclor 1268	ND		ug/kg	17.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	89		30-150
Decachlorobiphenyl	94		30-150
2,4,5,6-Tetrachloro-m-xylene	85		30-150
Decachlorobiphenyl	87		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-21	Date Collected:	07/12/12 11:35
Client ID:	CMU-C-2	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/18/12 16:52	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	51.9	--	1
Aroclor 1221	ND		ug/kg	51.9	--	1
Aroclor 1232	ND		ug/kg	51.9	--	1
Aroclor 1242	ND		ug/kg	51.9	--	1
Aroclor 1248	ND		ug/kg	34.6	--	1
Aroclor 1254	ND		ug/kg	51.9	--	1
Aroclor 1260	78.4		ug/kg	34.6	--	1
Aroclor 1262	ND		ug/kg	17.3	--	1
Aroclor 1268	ND		ug/kg	17.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	78		30-150
Decachlorobiphenyl	87		30-150
2,4,5,6-Tetrachloro-m-xylene	76		30-150
Decachlorobiphenyl	82		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-22	Date Collected:	07/12/12 11:40
Client ID:	CMU-C-3	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/18/12 17:06	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	54.4	--	1
Aroclor 1221	ND		ug/kg	54.4	--	1
Aroclor 1232	ND		ug/kg	54.4	--	1
Aroclor 1242	ND		ug/kg	54.4	--	1
Aroclor 1248	ND		ug/kg	36.3	--	1
Aroclor 1254	ND		ug/kg	54.4	--	1
Aroclor 1260	45.1		ug/kg	36.3	--	1
Aroclor 1262	ND		ug/kg	18.1	--	1
Aroclor 1268	ND		ug/kg	18.1	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	76		30-150
Decachlorobiphenyl	97		30-150
2,4,5,6-Tetrachloro-m-xylene	72		30-150
Decachlorobiphenyl	88		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-23	Date Collected:	07/12/12 11:45
Client ID:	CMU-C-4	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/18/12 17:19	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	55.6	--	1
Aroclor 1221	ND		ug/kg	55.6	--	1
Aroclor 1232	ND		ug/kg	55.6	--	1
Aroclor 1242	ND		ug/kg	55.6	--	1
Aroclor 1248	ND		ug/kg	37.1	--	1
Aroclor 1254	ND		ug/kg	55.6	--	1
Aroclor 1260	59.2		ug/kg	37.1	--	1
Aroclor 1262	ND		ug/kg	18.6	--	1
Aroclor 1268	ND		ug/kg	18.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	99		30-150
Decachlorobiphenyl	102		30-150
2,4,5,6-Tetrachloro-m-xylene	95		30-150
Decachlorobiphenyl	97		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-24	Date Collected:	07/12/12 11:50
Client ID:	CMU-C-5	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/18/12 17:32	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	51.3	--	1
Aroclor 1221	ND		ug/kg	51.3	--	1
Aroclor 1232	ND		ug/kg	51.3	--	1
Aroclor 1242	ND		ug/kg	51.3	--	1
Aroclor 1248	ND		ug/kg	34.2	--	1
Aroclor 1254	ND		ug/kg	51.3	--	1
Aroclor 1262	ND		ug/kg	17.1	--	1
Aroclor 1268	ND		ug/kg	17.1	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	81		30-150
Decachlorobiphenyl	84		30-150
2,4,5,6-Tetrachloro-m-xylene	81		30-150
Decachlorobiphenyl	79		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-24	Date Collected:	07/12/12 11:50
Client ID:	CMU-C-5	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/18/12 17:32	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	ND		ug/kg	34.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	81		30-150
Decachlorobiphenyl	84		30-150
2,4,5,6-Tetrachloro-m-xylene	81		30-150
Decachlorobiphenyl	79		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-25	Date Collected:	07/12/12 11:55
Client ID:	CMU-C-6	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/18/12 17:45	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.0	--	1
Aroclor 1221	ND		ug/kg	57.0	--	1
Aroclor 1232	ND		ug/kg	57.0	--	1
Aroclor 1242	ND		ug/kg	57.0	--	1
Aroclor 1248	ND		ug/kg	38.0	--	1
Aroclor 1254	ND		ug/kg	57.0	--	1
Aroclor 1260	ND		ug/kg	38.0	--	1
Aroclor 1262	ND		ug/kg	19.0	--	1
Aroclor 1268	ND		ug/kg	19.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	64		30-150
Decachlorobiphenyl	66		30-150
2,4,5,6-Tetrachloro-m-xylene	61		30-150
Decachlorobiphenyl	62		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-26	Date Collected:	07/12/12 12:00
Client ID:	CMU-C-7	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/19/12 10:42	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.9	--	1
Aroclor 1221	ND		ug/kg	56.9	--	1
Aroclor 1232	ND		ug/kg	56.9	--	1
Aroclor 1242	ND		ug/kg	56.9	--	1
Aroclor 1248	ND		ug/kg	38.0	--	1
Aroclor 1254	ND		ug/kg	56.9	--	1
Aroclor 1262	ND		ug/kg	19.0	--	1
Aroclor 1268	ND		ug/kg	19.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	100		30-150
Decachlorobiphenyl	103		30-150
2,4,5,6-Tetrachloro-m-xylene	99		30-150
Decachlorobiphenyl	103		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-26	Date Collected:	07/12/12 12:00
Client ID:	CMU-C-7	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/19/12 10:42	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	38.1		ug/kg	38.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	100		30-150
Decachlorobiphenyl	103		30-150
2,4,5,6-Tetrachloro-m-xylene	99		30-150
Decachlorobiphenyl	103		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-27	Date Collected:	07/12/12 12:05
Client ID:	CMU-C-8	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/19/12 10:55	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	55.2	--	1
Aroclor 1221	ND		ug/kg	55.2	--	1
Aroclor 1232	ND		ug/kg	55.2	--	1
Aroclor 1242	ND		ug/kg	55.2	--	1
Aroclor 1248	ND		ug/kg	36.8	--	1
Aroclor 1254	ND		ug/kg	55.2	--	1
Aroclor 1260	68.7		ug/kg	36.8	--	1
Aroclor 1262	ND		ug/kg	18.4	--	1
Aroclor 1268	ND		ug/kg	18.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	99		30-150
Decachlorobiphenyl	99		30-150
2,4,5,6-Tetrachloro-m-xylene	95		30-150
Decachlorobiphenyl	98		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-28	Date Collected:	07/12/12 14:00
Client ID:	EQUIP BLANK-3	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	97,8082	Extraction Date:	07/14/12 00:35
Analytical Date:	07/17/12 08:32	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
		Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/l	0.250	--	1
Aroclor 1221	ND		ug/l	0.250	--	1
Aroclor 1232	ND		ug/l	0.250	--	1
Aroclor 1242	ND		ug/l	0.250	--	1
Aroclor 1248	ND		ug/l	0.250	--	1
Aroclor 1254	ND		ug/l	0.250	--	1
Aroclor 1260	ND		ug/l	0.250	--	1
Aroclor 1262	ND		ug/l	0.250	--	1
Aroclor 1268	ND		ug/l	0.250	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	92		30-150
Decachlorobiphenyl	71		30-150
2,4,5,6-Tetrachloro-m-xylene	87		30-150
Decachlorobiphenyl	76		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-29	Date Collected:	07/12/12 13:00
Client ID:	CMU-D-5	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/19/12 11:08	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	54.0	--	1
Aroclor 1221	ND		ug/kg	54.0	--	1
Aroclor 1232	ND		ug/kg	54.0	--	1
Aroclor 1242	ND		ug/kg	54.0	--	1
Aroclor 1248	ND		ug/kg	36.0	--	1
Aroclor 1254	ND		ug/kg	54.0	--	1
Aroclor 1260	ND		ug/kg	36.0	--	1
Aroclor 1262	ND		ug/kg	18.0	--	1
Aroclor 1268	ND		ug/kg	18.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	106		30-150
Decachlorobiphenyl	108		30-150
2,4,5,6-Tetrachloro-m-xylene	98		30-150
Decachlorobiphenyl	92		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-30	Date Collected:	07/12/12 13:05
Client ID:	CMU-D-6	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/19/12 11:22	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	52.2	--	1
Aroclor 1221	ND		ug/kg	52.2	--	1
Aroclor 1232	ND		ug/kg	52.2	--	1
Aroclor 1242	ND		ug/kg	52.2	--	1
Aroclor 1248	ND		ug/kg	34.8	--	1
Aroclor 1254	ND		ug/kg	52.2	--	1
Aroclor 1260	ND		ug/kg	34.8	--	1
Aroclor 1262	ND		ug/kg	17.4	--	1
Aroclor 1268	ND		ug/kg	17.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	107		30-150
Decachlorobiphenyl	113		30-150
2,4,5,6-Tetrachloro-m-xylene	102		30-150
Decachlorobiphenyl	107		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-31	Date Collected:	07/12/12 13:10
Client ID:	CMU-E-5	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/19/12 11:35	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	50.2	--	1
Aroclor 1221	ND		ug/kg	50.2	--	1
Aroclor 1232	ND		ug/kg	50.2	--	1
Aroclor 1242	ND		ug/kg	50.2	--	1
Aroclor 1248	ND		ug/kg	33.5	--	1
Aroclor 1254	ND		ug/kg	50.2	--	1
Aroclor 1260	ND		ug/kg	33.5	--	1
Aroclor 1262	ND		ug/kg	16.8	--	1
Aroclor 1268	ND		ug/kg	16.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	84		30-150
Decachlorobiphenyl	91		30-150
2,4,5,6-Tetrachloro-m-xylene	83		30-150
Decachlorobiphenyl	88		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212415

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212415-32	Date Collected:	07/12/12 13:15
Client ID:	CMU-E-6	Date Received:	07/12/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 23:00
Analytical Date:	07/19/12 11:48	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.7	--	1
Aroclor 1221	ND		ug/kg	57.7	--	1
Aroclor 1232	ND		ug/kg	57.7	--	1
Aroclor 1242	ND		ug/kg	57.7	--	1
Aroclor 1248	ND		ug/kg	38.5	--	1
Aroclor 1254	ND		ug/kg	57.7	--	1
Aroclor 1260	53.2		ug/kg	38.5	--	1
Aroclor 1262	ND		ug/kg	19.2	--	1
Aroclor 1268	ND		ug/kg	19.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	99		30-150
Decachlorobiphenyl	105		30-150
2,4,5,6-Tetrachloro-m-xylene	95		30-150
Decachlorobiphenyl	100		30-150

Project Name: MBTA/LECHMERE

Project Number: P2814

Lab Number: L1212415

Report Date: 07/20/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/17/12 06:19
Analyst: BA

Extraction Method: EPA 3510C
Extraction Date: 07/14/12 00:35
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/15/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/15/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01,28 Batch: WG548400-1					
Aroclor 1016	ND		ug/l	0.250	--
Aroclor 1221	ND		ug/l	0.250	--
Aroclor 1232	ND		ug/l	0.250	--
Aroclor 1242	ND		ug/l	0.250	--
Aroclor 1248	ND		ug/l	0.250	--
Aroclor 1254	ND		ug/l	0.250	--
Aroclor 1260	ND		ug/l	0.250	--
Aroclor 1262	ND		ug/l	0.250	--
Aroclor 1268	ND		ug/l	0.250	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	87		30-150
Decachlorobiphenyl	87		30-150
2,4,5,6-Tetrachloro-m-xylene	78		30-150
Decachlorobiphenyl	96		30-150

Project Name: MBTA/LECHMERE

Project Number: P2814

Lab Number: L1212415

Report Date: 07/20/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/18/12 20:11
Analyst: KB

Extraction Method: EPA 3540C
Extraction Date: 07/17/12 16:25
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/18/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/18/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 02-11,13-18 Batch: WG549005-1					
Aroclor 1016	ND		ug/kg	57.2	--
Aroclor 1221	ND		ug/kg	57.2	--
Aroclor 1232	ND		ug/kg	57.2	--
Aroclor 1242	ND		ug/kg	57.2	--
Aroclor 1248	ND		ug/kg	38.2	--
Aroclor 1254	ND		ug/kg	57.2	--
Aroclor 1260	ND		ug/kg	38.2	--
Aroclor 1262	ND		ug/kg	19.1	--
Aroclor 1268	ND		ug/kg	19.1	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	75		30-150
Decachlorobiphenyl	79		30-150
2,4,5,6-Tetrachloro-m-xylene	98		30-150
Decachlorobiphenyl	75		30-150

Project Name: MBTA/LECHMERE

Project Number: P2814

Lab Number: L1212415

Report Date: 07/20/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/18/12 17:59
Analyst: KB

Extraction Method: EPA 3540C
Extraction Date: 07/17/12 23:00
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/18/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/18/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 20-27,29-32 Batch: WG549059-1					
Aroclor 1016	ND		ug/kg	58.0	--
Aroclor 1221	ND		ug/kg	58.0	--
Aroclor 1232	ND		ug/kg	58.0	--
Aroclor 1242	ND		ug/kg	58.0	--
Aroclor 1248	ND		ug/kg	38.7	--
Aroclor 1254	ND		ug/kg	58.0	--
Aroclor 1260	ND		ug/kg	38.7	--
Aroclor 1262	ND		ug/kg	19.3	--
Aroclor 1268	ND		ug/kg	19.3	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	73		30-150
Decachlorobiphenyl	77		30-150
2,4,5,6-Tetrachloro-m-xylene	70		30-150
Decachlorobiphenyl	74		30-150

Project Name: MBTA/LECHMERE

Project Number: P2814

Lab Number: L1212415

Report Date: 07/20/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/20/12 10:58
Analyst: KB

Extraction Method: EPA 3540C
Extraction Date: 07/19/12 11:52
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/20/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/20/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 12,19 Batch: WG549518-1					
Aroclor 1016	ND		ug/kg	54.2	--
Aroclor 1221	ND		ug/kg	54.2	--
Aroclor 1232	ND		ug/kg	54.2	--
Aroclor 1242	ND		ug/kg	54.2	--
Aroclor 1248	ND		ug/kg	36.1	--
Aroclor 1254	ND		ug/kg	54.2	--
Aroclor 1260	ND		ug/kg	36.1	--
Aroclor 1262	ND		ug/kg	18.0	--
Aroclor 1268	ND		ug/kg	18.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	106		30-150
Decachlorobiphenyl	87		30-150
2,4,5,6-Tetrachloro-m-xylene	92		30-150
Decachlorobiphenyl	78		30-150

Lab Control Sample Analysis
Batch Quality Control

Project Name: MBTA/LECHMERE
Project Number: P2814
Lab Number: L1212415
Report Date: 07/20/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01,28 Batch: WG548400-2 WG548400-3								
Aroclor 1016	82		76		40-140	8		20
Aroclor 1260	74		76		40-140	3		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	93		82		30-150
Decachlorobiphenyl	90		88		30-150
2,4,5,6-Tetrachloro-m-xylene	87		77		30-150
Decachlorobiphenyl	99		91		30-150

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 02-11,13-18 Batch: WG549005-2 WG549005-3								
Aroclor 1016	74		86		40-140	15		30
Aroclor 1260	92		94		40-140	2		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	92		98		30-150
Decachlorobiphenyl	102		104		30-150
2,4,5,6-Tetrachloro-m-xylene	87		92		30-150
Decachlorobiphenyl	95		97		30-150

Lab Control Sample Analysis
Batch Quality Control

Project Name: MBTA/LECHMERE
Project Number: P2814
Lab Number: L1212415
Report Date: 07/20/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 20-27,29-32 Batch: WG549059-2 WG549059-3								
Aroclor 1016	72		83		40-140	14		30
Aroclor 1260	71		85		40-140	18		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	81		88		30-150
Decachlorobiphenyl	83		102		30-150
2,4,5,6-Tetrachloro-m-xylene	76		84		30-150
Decachlorobiphenyl	78		96		30-150

MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 12,19 Batch: WG549518-2 WG549518-3								
Aroclor 1016	92		92		40-140	0		30
Aroclor 1260	83		84		40-140	1		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	104		100		30-150
Decachlorobiphenyl	92		87		30-150
2,4,5,6-Tetrachloro-m-xylene	94		90		30-150
Decachlorobiphenyl	83		78		30-150

INORGANICS
&
MISCELLANEOUS

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-02
Client ID: CMU-A-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 08:00
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-03
Client ID: CMU-A-1_DUP
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 08:00
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-04
Client ID: CMU-A-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 08:07
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-05
Client ID: CMU-A-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 08:14
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-06
Client ID: CMU-A-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 08:20
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-07
Client ID: CMU-A-5
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 08:30
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-08
Client ID: CMU-A-6
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 08:37
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-09
Client ID: CMU-A-7
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 08:45
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-10
Client ID: CMU-A-8
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 08:50
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-11
Client ID: CMU-B-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 09:30
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-12
Client ID: CMU-B-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 09:35
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-13
Client ID: CMU-B-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 09:42
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-14
Client ID: CMU-B-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 09:50
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-15
Client ID: CMU-B-5
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 10:00
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-16
Client ID: CMU-B-6
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 10:10
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-17
Client ID: CMU-B-7
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 10:15
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-18
Client ID: CMU-B-8
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 10:30
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-19
Client ID: CMU-C-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 11:30
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-20
Client ID: CMU-C-1_DUP
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 11:30
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-21
Client ID: CMU-C-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 11:35
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:25	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-22
Client ID: CMU-C-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 11:40
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-23
Client ID: CMU-C-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 11:45
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-24
Client ID: CMU-C-5
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 11:50
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-25
Client ID: CMU-C-6
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 11:55
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-26
Client ID: CMU-C-7
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 12:00
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-27
Client ID: CMU-C-8
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 12:05
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-29
Client ID: CMU-D-5
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 13:00
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-30
Client ID: CMU-D-6
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 13:05
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-31
Client ID: CMU-E-5
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 13:10
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:45	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212415-32
Client ID: CMU-E-6
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/12/12 13:15
Date Received: 07/12/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 00:45	30,2540G	RD

Lab Duplicate Analysis
Batch Quality Control

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02-21 QC Batch ID: WG548148-1 QC Sample: L1212415-02 Client ID: CMU-A-1						
Solids, Total	100	100	%	0		20
General Chemistry - Westborough Lab Associated sample(s): 22-27,29-32 QC Batch ID: WG548149-1 QC Sample: L1212415-22 Client ID: CMU-C-3						
Solids, Total	100	100	%	0		20

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal

Cooler	
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1212415-01A	Amber 1000ml unpreserved	A	7	5	Y	Absent	MCP-8082-10(365)
L1212415-01B	Amber 1000ml unpreserved	A	7	5	Y	Absent	MCP-8082-10(365)
L1212415-02A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-03A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-04A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-05A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-06A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-07A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-08A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-09A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-10A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-11A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-12A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-13A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-14A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-15A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-16A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-17A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-18A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)

*Values in parentheses indicate holding time in days

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212415
Report Date: 07/20/12

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1212415-19A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-20A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-21A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-22A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-23A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-24A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-25A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-26A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-27A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-28A	Amber 1000ml unpreserved	A	7	5	Y	Absent	MCP-8082-10(365)
L1212415-28B	Amber 1000ml unpreserved	A	7	5	Y	Absent	MCP-8082-10(365)
L1212415-29A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-30A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-31A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212415-32A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)

*Values in parentheses indicate holding time in days

Project Name:	MBTA/LECHMERE	**Lab Number:**	L1212415
Project Number:	P2814	**Report Date:**	07/20/12

GLOSSARY

Acronyms

EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NI	- Not Ignitable.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit.
C	- Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
D	- Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
E	- Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
G	- The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.
H	- The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
I	- The RPD between the results for the two columns exceeds the method-specified criteria; however, the lower value has been reported due to obvious interference.
M	- Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
NJ	- Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

Report Format: Data Usability Report

Project Name:	MBTA/LECHMERE	**Lab Number:**	L1212415
Project Number:	P2814	**Report Date:**	07/20/12

Data Qualifiers

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name: MBTA/LECHMERE **Lab Number:** L1212415
Project Number: P2814 **Report Date:** 07/20/12

REFERENCES

30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certificate/Approval Program Summary

Last revised May 11, 2012 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. ***NELAP Accredited Solid Waste/Soil.***

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP) 504.1, Ethylene Dibromide (EDB) 504.1, 1,4-Dioxane (Mod 8270). Microbiology Parameters: Total Coliform-MF mEndo (SM9222B), Total Coliform – Colilert (SM9223 P/A), E. Coli. – Colilert (SM9223 P/A), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D, Fecal Coliform-EC Medium 9221E).

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, O-Phosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics, TPH (HEM/SGT), Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH. Microbiology Parameters: Total Coliform – MF mEndo (SM9222B), Total Coliform – MTF (SM9221B), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform – A-1 Broth (SM9221E), Enterolert, E.Coli 9223.

Solid Waste/Soil (Inorganic Parameters: pH, Sulfide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), SPLP Leach (1312 metals only), Reactivity. Organic Parameters: PCBs, PCBs in Oil, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH, Dicamba, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Dalapon, Volatile Organics, Acid Extractables (Phenols), Benzidines, Phthalates, Nitrosamines, Nitroaromatics & Cyclic Ketones, PAHs, Haloethers, Chlorinated Hydrocarbons.)

Maine Department of Human Services Certificate/Lab ID: 2009024.
Drinking Water (Inorganic Parameters: SM9215B, 9222D, 9223B, EPA 180.1, 353.2, SM2130B, 2320B, 2540C, 4500Cl-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H+B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1, EPA 300.0. Organic Parameters: 504.1, 524.2.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, SM2320B, 2510B, 2540C, 2540D, 426C, 4500Cl-D, 4500Cl-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NO3-F, 4500P-B, 4500P-E, 5210B, 5220D, 5310C, 9010B, 9040B, 9030B, 7470A, 7196A, 2340B, EPA 200.7, 6010B, 200.8, 6020, 245.1, 1311, 1312, 3005A, Enterolert, 9223D, 9222D. Organic Parameters: 608, 624, 625, 8081A, 8082, 8330, 8151A, 8260B, 8270C, 3510C, 3630C, 5030B, ME-DRO, ME-GRO, MA-EPH, MA-VPH.)

Solid Waste/Soil (Inorganic Parameters: 9010B, 9012A, 9014A, 9030B, 9040B, 9045C, 6010B, 7471A, 7196A, 9050A, 1010, 1030, 9065, 1311, 1312, 3005A, 3050B. Organic Parameters: ME-DRO, ME-GRO, MA-EPH, MA-VPH, 8260B, 8270C, 8330, 8151A, 8081A, 8082, 3540C, 3546, 3580A, 3630C, 5030B, 5035.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.
*Drinking Water (*Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl) (EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Fluoride, Sulfate); (EPA 353.2 for: Nitrate-N, Nitrite-N); (SM4500NO3-F for: Nitrate-N and Nitrite-N); 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, 2320B, SM2540C, SM4500H-B. Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics); (504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), EPA 332. Microbiology Parameters: SM9215B; ENZ. SUB. SM9223; ColilertQT SM9223B; MF-SM9222D.)

*Non-Potable Water (*Inorganic Parameters:, (EPA 200.8 for: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn); (EPA 200.7 for: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn); 245.1, SM4500H,B, EPA 120.1,

SM2510B, 2540C, 2340B, 2320B, 4500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia-N), LACHAT 10-107-06-1-B for Ammonia-N, SM4500NO3-F, 353.2 for Nitrate-N, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 5310C, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.
Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics),(608 for: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT,Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs-Water), (EPA 625 for SVOC Acid Extractables and SVOC Base/Neutral Extractables), 600/4-81-045-PCB-Oil. Microbiology Parameters: (ColilertQT SM9223B; Enterolert-QT: SM9222D-MF.)

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM 9222B, 9223B, 9215B, EPA 200.7, 200.8, 245.2, 300.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 332.0. Organic Parameters: 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 3005A, 200.7, 200.8, 245.1, 245.2, SW-846 6010B, 6010C, 6020, 6020A, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 350.2, 351.1, 353.2, 410.4, 420.1, 426C, 1664A, SW-846 9010B, 9030B, 9040B, SM426C, SM2120B, 2310B, 2320B, 2540B, 2540D, 4500H+B, 4500CL-E, 4500CN-E, 4500NH3-H, 4500NO3-F, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 5220D, 2510B, 2540C, 4500F-C, 5310C, 5540C, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D. Organic Parameters: SW-846 3510C, 3630C, 5030B, 8260B, 8270C, 8270D, 8330, EPA 624, 625, 608, SW-846 8082, 8081A, 8081B, 8151A.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 6010C, 7196A, 7471A, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040B, 9045C, 9050, 9065,1311, 1312, 3005A, 3050B, 3060A. Organic Parameters: SW-846 3540C, 3546, 3550B, 3580A, 3630C, 5030B, 5035, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330, 8151A, 8015B, 8082, 8082A, 8081A, 8081B.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9223B, 9215B, 4500CN-CE, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 200.8, 245.2, 2540C, SM2120B, 2320B, 2510B, 5310C, SM4500H-B. Organic Parameters: EPA 332, 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500Cl-E, EPA 300.0, SM2120B, 2340B, SM4500F-BC, EPA 200.7, 200.8, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM510ABC, SM4500P-B5+E, 2540B, 2540C, 2540D, 2540G, EPA 120.1, SM2510B, SM15 426C, 9222D, 9221B, 9221C, 9221E, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, 350.2, SW-846 1312, 7470A, 5540C, SM4500H-B, 4500SO3-B, SM3500Cr-D, 4500CN-CE, EPA 245.1, 245.2, SW-846 9040B, 3005A, 3015, EPA 6010B, 6010C, 6020, 6020A, 7196A, 3060A, SW-846 9010B, 9030B. Organic Parameters: SW-846 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3510C, EPA 608, 624, 625, SW-846 3630C, 5030B, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 1,4-Dioxane by NJ Modified 8270, 8015B, NJ OQA-QAM-025 Rev.7, NJ EPH.)

Solid & Chemical Materials (Inorganic Parameters: SW-846, 6010B, 6010C,6020, 6020A, 7196A, 3060A, 9010B, 9030B, 1010, 1030, 1311, 1312, 3005A, 3050B, 7471A, 7471B, 9014, 9012A, 9040B, 9045C, 9050A, 9065. Organic Parameters: SW-846 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3540C, 3546, 3580A, 3630C, 5030B, 5035L, 5035H, NJ OQA-QAM-025 Rev.7, NJ EPH.)

New York Department of Health Certificate/Lab ID: 11148. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9223B, 9222B, 9215B, EPA 200.8, 200.7, 245.2, SM5310C, EPA 332.0, SM2320B, EPA 300.0, SM2120B, 4500CN-E, 4500F-C, 4500NO3-F, 2540C, SM 2510B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222B, 9215B, 5210B, 5310C, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, SM4500CL-E, 4500F-C, SM15 426C, EPA 350.1, SM4500NH3-BH, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, SM4500-NO3-F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6010C, 6020, 6020A, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, LACHAT 10-204-00-1-A, 4500CN-CE, EPA 1664A, EPA 420.1, SM14 510C, EPA 120.1, SM2510B, SM4500S-D, SM5540C, EPA 3005A, 3015, 9010B, 9030B. Organic Parameters: EPA 624, 8260B, 8270C, 8270D, 625, 608, 8081A, 8081B, 8151A, 8330, 8082, 8082A, EPA 3510C, 5030B.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010, 1030, EPA 6010B, 6010C, 7196A, 7471A, 7471B, 9012A, 9014, 9065, 9050A, EPA 1311, 1312, 3005A, 3050B, 9010B, 9030B. Organic Parameters: EPA 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8015B, 8015C, 8081A, 8081B, 8151A, 8330, 8082 8082A, 3540C, 3546, 3580, 3580A, 5030B, 5035.)

North Carolina Department of the Environment and Natural Resources Certificate/Lab ID : 666. Organic Parameters: MA-EPH, MA-VPH.

Drinking Water Program Certificate/Lab ID: 25700. (Inorganic Parameters: Chloride EPA 300.0. Organic Parameters: 524.2)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. ***NELAP Accredited.***
Drinking Water (Organic Parameters: EPA 524.2, 504.1)

Non-Potable Water (Inorganic Parameters: EPA 1312, 3005A, 200.7, 410.4, 1664A, SM2540D, 5210B, 5220D, 4500-P,BE. Organic Parameters: EPA 3510C, 3630C, 5030B, 625, 624, 608, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330)

Solid & Hazardous Waste (Inorganic Parameters: EPA 350.1, 1010, 1030, 1311, 1312, 3050B, 3060A, 6010B, 6010C, 7196A, 7471A, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065, SM 4500NH3-H. Organic Parameters: 3540C, 3546, 3580A, 3630C, 5035, 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. ***NELAP Accredited via NY-DOH.***
Refer to MA-DEP Certificate for Potable and Non-Potable Water.
Refer to NJ-DEP Certificate for Potable and Non-Potable Water.

Texas Commisson on Environmental Quality Certificate/Lab ID: T104704476-09-1. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664, 200.7, 200.8, 245.1, 245.2, 300.0, 350.1, 351.1, 353.2, 410.4, 420.1, 6010, 6020, 7196, 7470, 9040, SM 2120B, 2310B, 2320B, 2510B, 2540B, 2540C, 2540D, 426C, 4500CL-E, 4500CN-E, 4500F-C, 4500H+B, 4500NH3-H, 4500NO2B, 4500P-E, 4500 S2¯D, 510C, 5210B, 5220D, 5310C, 5540C. Organic Parameters: EPA 608, 624, 625, 8081, 8082, 8151, 8260, 8270, 8330.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1311, 1312, 9012, 9014, 9040, 9045, 9050, 9065.)

Virginia Division of Consolidated Laboratory Services Certificate/Lab ID: 460195. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 3005A,3015,1312,6010B,6010C,SM4500S-D, SM4500-CN-CE, Lachat 10-204-00-1-X. Organic Parameters: EPA 8260B)

Solid & Hazardous Waste (Inorganic Parameters: EPA 3050B, 1311, 1312, 6010B, 6010C, 9030B, 9010B, 9012A, 9014. Organic Parameters: EPA 5035, 5030B, 8260B, 8015B, 8015C.)

Department of Defense, L-A-B Certificate/Lab ID: L2217.
Drinking Water (Inorganic Parameters: SM 4500H-B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: EPA 200.7, 200.8, 6010B, 6010C, 6020, 6020A, 245.1, 245.2, 7470A, 9040B, 9010B, 180.1. 300.0, 332.0, 6860, 353.2, 410.4, 9060, 1664A, SM 4500CN-E, 4500H-B, 4500NO3-F, 4500CL-D, 5220D, 5310C, 2130B, 2320B, 2540C, 3005A, 3015, 9010B, 9056. Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A, 8082, 8082A, 8081A, 8081B, 3510C, 5030B, MassDEP EPH, MassDEP VPH.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 200.7, 6010B, 6010C, 7471A, 6860, 1311, 1312, 3050B, 7196A, 9010B, 9012A, 9040B, 9045C, 3500-CR-D, 4500CN-CE, 2540G, Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A/B-prep, 8082, 8082A, 8081A, 8081B, 3540C, 3546, 3580A, 5035A, MassDEP EPH, MassDEP VPH.)

The following analytes are not included in our current NELAP/TNI Scope of Accreditation:
EPA 8260B: Freon-113, 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene. **EPA 8330A:** PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT. **EPA 8270C:** Methyl naphthalene, Dimethyl naphthalene, Total Methylnapthalenes, Total Dimethylnaphthalenes, 1,4-Diphenylhydrazine (Azobenzene). **EPA 625:** 4-Chloroaniline, 4-Methylphenol. Total Phosphorus in a soil matrix, Chloride in a soil matrix, TKN in a soil matrix, NO2 in a soil matrix, NO3 in a soil matrix, SO4 in a soil matrix. **EPA 9071:** Total Petroleum Hydrocarbons, Oil & Grease

CHAIN OF CUSTODY

PAGE 1 OF 4

ALPHA ANALYTICAL — World Class Chemistry

8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 7/12/12

ALPHA Job #: L1212415

Project Information

Project Name: MBTA/Lechmere
Project Location: Cambridge
Project #: P2814
Project Manager: Matt Alger
ALPHA Quote #:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #: P2814

Client Information

Client: Nover-Armstrong Assoc, Inc
Address: 124 Main St, Unit 2B
Carver, MA 02330
Phone: 508-866-8383
Email: malger@noverarmstrong.com

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods
☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program TSCA Criteria

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Additional Project Information:

Use Soxhlet Extraction

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☒ PCB ☐ PEST Soxhlet; TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	PCB	Sample Comments	TOTAL # BOTTLES
12415-01	EQUIP BLANK - 2	7/12/12	7:55am	DI Water	MA	2		2
-02	CMU-A-1		8:00am	Concrete Powder	MA	1		1
-03	CMU-A-1 DUP		8:00			1		1
-04	CMU-A-2		8:07			1		1
-05	CMU-A-3		8:14			1		1
-06	CMU-A-4		8:20			1		1
-07	CMU-A-5		8:30			1		1
-08	CMU-A-6		8:37			1		1
-09	CMU-A-7		8:45			1		1
-10	CMU-A-8		8:50			1		1
					Container Type	A		
					Preservative	A		

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H= $Na_2S_2O_3$
I= Ascorbic Acid
J= NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7/12/12 3:30pm	[signature]	7/12/12

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

CHAIN OF CUSTODY

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ALPHA ANALYTICAL — World Class Chemistry

8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 7/12/12

ALPHA Job #: L1212415

Project Information

Project Name: MBTA/Lechmere
Project Location: Cambridge
Project #: P2814
Project Manager: Matt Alger
ALPHA Quote #:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #: P2814

Client Information

Client: Nover-Armstrong Assoc., Inc.
Address: 124 Main St, Unit 2G
Carver, MA 02330
Phone: 508-866-8383
Email: malger@noverarmstrong.com

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods
☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program TSCA Criteria

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Additional Project Information:

Use Soxhlet Extraction

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☒ PCB ☐ PEST Soxhlet; TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	PCB	Sample Comments	Total # Bottles
12415-11	CMU-B-1	7/12/12	9:30	Concrete Powder	MA	1		1
-12	CMU-B-2		9:35			1		1
-13	CMU-B-3		9:42			1		1
-14	CMU-B-4		9:50			1		1
-15	CMU-B-5		10:00			1		1
-16	CMU-B-6		10:10			1		1
-17	CMU-B-7		10:15			1		1
-18	CMU-B-8		10:30			1		1
-19	CMU-C-1		11:30			1		1
-20	CMU-C-1_DUP		11:30			1		1
				Container Type		A		
				Preservative		1		

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Matt Alger	7/12/12 3:30 pm	[illegible]	7/12/12 [illegible]

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

CHAIN OF CUSTODY

PAGE 3 OF 4

Date Rec'd in Lab: 7/12/12

ALPHA Job #: L1212415

ALPHA ANALYTICAL — World Class Chemistry
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Project Information

Project Name: MBTA/Lechmere
Project Location: Cambridge
Project #: P2814
Project Manager: Matt Alger
ALPHA Quote #:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #: P2814

Client Information

Client: Naver-Armstrong Assoc.
Address: 124 Main St, Unit 266, Carver, MA
Phone: 508-866-8383
Email: malger@noverarmstrong.com

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program TSCA Criteria

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Additional Project Information:

Use Soxhlet Extraction

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☒ PCB ☐ PEST Soxhlet; TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	PCB	Sample Comments	TOTAL # BOTTLES
12415-21	CMU-C-2	7/12/12	11:35	Concrete Powder	MA	1		1
-22	CMU-C-3		11:40			1		1
-23	CMU-C-4		11:45			1		1
-24	CMU-C-5		11:50			1		1
-25	CMU-C-6		11:55			1		1
-26	CMU-C-7		12:00			1		1
-27	CMU-C-8		12:05			1		1
-28	EQUIP BLANK-3		14:00	DI Water		2		2
-29	CMU-D-5		13:00	Concrete Powder		1		1
-30	CMU-D-6		13:05			1		1
					Container Type	A		
					Preservative	A		

Container Type: P= Plastic, A= Amber glass, V= Vial, G= Glass, B= Bacteria cup, C= Cube, O= Other, E= Encore, D= BOD Bottle

Preservative: A= None, B= HCl, C= HNO_3, D= H_2SO_4, E= NaOH, F= MeOH, G= $NaHSO_4$, H= $Na_2S_2O_3$, I= Ascorbic Acid, J= NH_4Cl, K= Zn Acetate, O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7/12/12 3:36pm	[signature]	7/12/12

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

CHAIN OF CUSTODY

PAGE 4 OF 4

ALPHA ANALYTICAL — Water Class Chemistry

8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Date Rec'd in Lab: 7/12/12

ALPHA Job #: L1212415

Project Information

Project Name: MBTA / Lechmere
Project Location: Cambridge
Project #: P2814
Project Manager: Matt Alger
ALPHA Quote #:

Report Information - Data Deliverables

☒ ADEx ☐ EMAIL

Billing Information

☒ Same as Client info PO #: P2814

Client Information

Client: Novera Armstrong Assoc.
Address: 124 Main St, Unit 266, Carver MA 02330
Phone: 508-866-8383
Email: malger@noveramstrong.com

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program TSCA Criteria

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Additional Project Information:

Use Soxhlet Extraction

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☒ PCB ☐ PEST Soxhlet; TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	PCB	Sample Comments	TOTAL # BOTTLES
12415-31	CMU-E-5	7/12/12	13:10	Concrete Powder	MA	1		1
-32	CMU-E-6	1	13:15	1	1	1		1
	Container Type					A		
	Preservative					A		

Container Type: P= Plastic, A= Amber glass, V= Vial, G= Glass, B= Bacteria cup, C= Cube, O= Other, E= Encore, D= BOD Bottle

Preservative: A= None, B= HCl, C= HNO_3, D= H_2SO_4, E= NaOH, F= MeOH, G= $NaHSO_4$, H = $Na_2S_2O_3$, I= Ascorbic Acid, J = NH_4Cl, K= Zn Acetate, O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7/12/12 3:30 pm	[signature]	7/12/12 15:30

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FORM NO: 01-01 (rev. 12-Mar-2012)

ANALYTICAL REPORT

Lab Number:	L1212503
Client:	Nover-Armstrong Associates 124 Main Street Unit 2GG Carver, MA 02330
ATTN:	Matt Alger
Phone:	(508) 866-8383
Project Name:	MBTA/LECHMERE
Project Number:	P2814
Report Date:	07/20/12

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), USDA (Permit #P-330-11-00240), NC (666), TX (T104704476), DOD (L2217), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L1212503-01	CMU-D-1	CAMBRIDGE	07/13/12 08:00
L1212503-02	CMU-D-2	CAMBRIDGE	07/13/12 08:05
L1212503-03	CMU-D-3	CAMBRIDGE	07/13/12 08:10
L1212503-04	CMU-D-4	CAMBRIDGE	07/13/12 08:15
L1212503-05	CMU-D-7	CAMBRIDGE	07/13/12 08:20
L1212503-06	CMU-D-8	CAMBRIDGE	07/13/12 08:25
L1212503-07	CMU-E-1	CAMBRIDGE	07/13/12 08:40
L1212503-08	CMU-E-2	CAMBRIDGE	07/13/12 08:45
L1212503-09	CMU-E-3	CAMBRIDGE	07/13/12 08:50
L1212503-10	CMU-E-4	CAMBRIDGE	07/13/12 08:55
L1212503-11	CMU-E-7	CAMBRIDGE	07/13/12 09:00
L1212503-12	CMU-E-8	CAMBRIDGE	07/13/12 09:05
L1212503-13	CRACK-2	CAMBRIDGE	07/13/12 09:10
L1212503-14	CMU-H-1	CAMBRIDGE	07/13/12 09:30
L1212503-15	CMU-H-1_DUP	CAMBRIDGE	07/13/12 09:30
L1212503-16	CMU-H-2	CAMBRIDGE	07/13/12 09:40
L1212503-17	CMU-H-3	CAMBRIDGE	07/13/12 09:45
L1212503-18	CMU-H-4	CAMBRIDGE	07/13/12 09:50
L1212503-19	CMU-H-5	CAMBRIDGE	07/13/12 09:55
L1212503-20	CMU-H-6	CAMBRIDGE	07/13/12 10:00

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

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

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	YES
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name: MBTA/LECHMERE **Lab Number:** L1212503
Project Number: P2814 **Report Date:** 07/20/12

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Performance criteria for CAM and RCP methods allow for some LCS compound failures to occur and still be within method compliance. In these instances, the specific failures are not narrated but are noted in the associated QC table. This information is also incorporated in the Data Usability format for our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples free of charge for 30 days from the date the project is completed. After 30 days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples.

Please contact Client Services at 800-624-9220 with any questions.

Project Name:	MBTA/LECHMERE	**Lab Number:**	L1212503
Project Number:	P2814	**Report Date:**	07/20/12

Case Narrative (continued)

MCP Related Narratives

Report Submission

All MCP required questions were answered with affirmative responses; therefore, there are no relevant protocol-specific QC and/or performance standard non-conformances to report.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Elizabeth Simmons

Elizabeth Simmons

Title: Technical Director/Representative

Date: 07/20/12

ORGANICS

PCBS

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-01	Date Collected:	07/13/12 08:00
Client ID:	CMU-D-1	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 16:34	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.7	--	1
Aroclor 1221	ND		ug/kg	58.7	--	1
Aroclor 1232	ND		ug/kg	58.7	--	1
Aroclor 1242	ND		ug/kg	58.7	--	1
Aroclor 1248	ND		ug/kg	39.1	--	1
Aroclor 1254	ND		ug/kg	58.7	--	1
Aroclor 1260	223		ug/kg	39.1	--	1
Aroclor 1262	ND		ug/kg	19.6	--	1
Aroclor 1268	ND		ug/kg	19.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	88		30-150
Decachlorobiphenyl	103		30-150
2,4,5,6-Tetrachloro-m-xylene	87		30-150
Decachlorobiphenyl	93		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-02	Date Collected:	07/13/12 08:05
Client ID:	CMU-D-2	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 16:48	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.2	--	1
Aroclor 1221	ND		ug/kg	56.2	--	1
Aroclor 1232	ND		ug/kg	56.2	--	1
Aroclor 1242	ND		ug/kg	56.2	--	1
Aroclor 1248	ND		ug/kg	37.4	--	1
Aroclor 1254	ND		ug/kg	56.2	--	1
Aroclor 1260	98.5		ug/kg	37.4	--	1
Aroclor 1262	ND		ug/kg	18.7	--	1
Aroclor 1268	ND		ug/kg	18.7	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	63		30-150
Decachlorobiphenyl	92		30-150
2,4,5,6-Tetrachloro-m-xylene	65		30-150
Decachlorobiphenyl	93		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-03	Date Collected:	07/13/12 08:10
Client ID:	CMU-D-3	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 17:01	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.1	--	1
Aroclor 1221	ND		ug/kg	58.1	--	1
Aroclor 1232	ND		ug/kg	58.1	--	1
Aroclor 1242	ND		ug/kg	58.1	--	1
Aroclor 1248	ND		ug/kg	38.8	--	1
Aroclor 1254	ND		ug/kg	58.1	--	1
Aroclor 1260	ND		ug/kg	38.8	--	1
Aroclor 1262	ND		ug/kg	19.4	--	1
Aroclor 1268	ND		ug/kg	19.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	70		30-150
Decachlorobiphenyl	93		30-150
2,4,5,6-Tetrachloro-m-xylene	73		30-150
Decachlorobiphenyl	77		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-04	Date Collected:	07/13/12 08:15
Client ID:	CMU-D-4	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 17:15	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.6	--	1
Aroclor 1221	ND		ug/kg	57.6	--	1
Aroclor 1232	ND		ug/kg	57.6	--	1
Aroclor 1242	ND		ug/kg	57.6	--	1
Aroclor 1248	ND		ug/kg	38.4	--	1
Aroclor 1254	ND		ug/kg	57.6	--	1
Aroclor 1260	ND		ug/kg	38.4	--	1
Aroclor 1262	ND		ug/kg	19.2	--	1
Aroclor 1268	ND		ug/kg	19.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	86		30-150
Decachlorobiphenyl	90		30-150
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	98		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-05	Date Collected:	07/13/12 08:20
Client ID:	CMU-D-7	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 17:29	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.4	--	1
Aroclor 1221	ND		ug/kg	57.4	--	1
Aroclor 1232	ND		ug/kg	57.4	--	1
Aroclor 1242	ND		ug/kg	57.4	--	1
Aroclor 1248	ND		ug/kg	38.2	--	1
Aroclor 1254	ND		ug/kg	57.4	--	1
Aroclor 1260	ND		ug/kg	38.2	--	1
Aroclor 1262	ND		ug/kg	19.1	--	1
Aroclor 1268	ND		ug/kg	19.1	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	95		30-150
2,4,5,6-Tetrachloro-m-xylene	95		30-150
Decachlorobiphenyl	100		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-06	Date Collected:	07/13/12 08:25
Client ID:	CMU-D-8	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 17:42	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.8	--	1
Aroclor 1221	ND		ug/kg	57.8	--	1
Aroclor 1232	ND		ug/kg	57.8	--	1
Aroclor 1242	ND		ug/kg	57.8	--	1
Aroclor 1248	ND		ug/kg	38.5	--	1
Aroclor 1254	ND		ug/kg	57.8	--	1
Aroclor 1260	ND		ug/kg	38.5	--	1
Aroclor 1262	ND		ug/kg	19.3	--	1
Aroclor 1268	ND		ug/kg	19.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	73		30-150
Decachlorobiphenyl	105		30-150
2,4,5,6-Tetrachloro-m-xylene	77		30-150
Decachlorobiphenyl	111		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-07	Date Collected:	07/13/12 08:40
Client ID:	CMU-E-1	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 17:56	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.5	--	1
Aroclor 1221	ND		ug/kg	57.5	--	1
Aroclor 1232	ND		ug/kg	57.5	--	1
Aroclor 1242	ND		ug/kg	57.5	--	1
Aroclor 1248	ND		ug/kg	38.3	--	1
Aroclor 1254	ND		ug/kg	57.5	--	1
Aroclor 1260	52.2		ug/kg	38.3	--	1
Aroclor 1262	ND		ug/kg	19.2	--	1
Aroclor 1268	ND		ug/kg	19.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	101		30-150
Decachlorobiphenyl	106		30-150
2,4,5,6-Tetrachloro-m-xylene	108		30-150
Decachlorobiphenyl	113		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-08	Date Collected:	07/13/12 08:45
Client ID:	CMU-E-2	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 18:10	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.2	--	1
Aroclor 1221	ND		ug/kg	58.2	--	1
Aroclor 1232	ND		ug/kg	58.2	--	1
Aroclor 1242	ND		ug/kg	58.2	--	1
Aroclor 1248	ND		ug/kg	38.8	--	1
Aroclor 1254	ND		ug/kg	58.2	--	1
Aroclor 1260	ND		ug/kg	38.8	--	1
Aroclor 1262	ND		ug/kg	19.4	--	1
Aroclor 1268	ND		ug/kg	19.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	96		30-150
Decachlorobiphenyl	110		30-150
2,4,5,6-Tetrachloro-m-xylene	103		30-150
Decachlorobiphenyl	111		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-09	Date Collected:	07/13/12 08:50
Client ID:	CMU-E-3	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 18:23	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.5	--	1
Aroclor 1221	ND		ug/kg	58.5	--	1
Aroclor 1232	ND		ug/kg	58.5	--	1
Aroclor 1242	ND		ug/kg	58.5	--	1
Aroclor 1248	ND		ug/kg	39.0	--	1
Aroclor 1254	ND		ug/kg	58.5	--	1
Aroclor 1260	ND		ug/kg	39.0	--	1
Aroclor 1262	ND		ug/kg	19.5	--	1
Aroclor 1268	ND		ug/kg	19.5	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	95		30-150
Decachlorobiphenyl	107		30-150
2,4,5,6-Tetrachloro-m-xylene	101		30-150
Decachlorobiphenyl	97		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-10	Date Collected:	07/13/12 08:55
Client ID:	CMU-E-4	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 18:37	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.8	--	1
Aroclor 1221	ND		ug/kg	58.8	--	1
Aroclor 1232	ND		ug/kg	58.8	--	1
Aroclor 1242	ND		ug/kg	58.8	--	1
Aroclor 1248	ND		ug/kg	39.2	--	1
Aroclor 1254	ND		ug/kg	58.8	--	1
Aroclor 1260	ND		ug/kg	39.2	--	1
Aroclor 1262	ND		ug/kg	19.6	--	1
Aroclor 1268	ND		ug/kg	19.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	91		30-150
Decachlorobiphenyl	107		30-150
2,4,5,6-Tetrachloro-m-xylene	96		30-150
Decachlorobiphenyl	109		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-11	Date Collected:	07/13/12 09:00
Client ID:	CMU-E-7	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 18:51	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.2	--	1
Aroclor 1221	ND		ug/kg	58.2	--	1
Aroclor 1232	ND		ug/kg	58.2	--	1
Aroclor 1242	ND		ug/kg	58.2	--	1
Aroclor 1248	ND		ug/kg	38.8	--	1
Aroclor 1254	ND		ug/kg	58.2	--	1
Aroclor 1260	48.2		ug/kg	38.8	--	1
Aroclor 1262	ND		ug/kg	19.4	--	1
Aroclor 1268	ND		ug/kg	19.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	80		30-150
Decachlorobiphenyl	108		30-150
2,4,5,6-Tetrachloro-m-xylene	83		30-150
Decachlorobiphenyl	112		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-12	Date Collected:	07/13/12 09:05
Client ID:	CMU-E-8	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:52
Analytical Date:	07/18/12 19:04	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.1	--	1
Aroclor 1221	ND		ug/kg	57.1	--	1
Aroclor 1232	ND		ug/kg	57.1	--	1
Aroclor 1242	ND		ug/kg	57.1	--	1
Aroclor 1248	ND		ug/kg	38.1	--	1
Aroclor 1254	ND		ug/kg	57.1	--	1
Aroclor 1260	49.9		ug/kg	38.1	--	1
Aroclor 1262	ND		ug/kg	19.0	--	1
Aroclor 1268	ND		ug/kg	19.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	106		30-150
Decachlorobiphenyl	111		30-150
2,4,5,6-Tetrachloro-m-xylene	113		30-150
Decachlorobiphenyl	111		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-13	Date Collected:	07/13/12 09:10
Client ID:	CRACK-2	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 13:00
Analytical Date:	07/18/12 19:18	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	99%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.0	--	1
Aroclor 1221	ND		ug/kg	58.0	--	1
Aroclor 1232	ND		ug/kg	58.0	--	1
Aroclor 1242	ND		ug/kg	58.0	--	1
Aroclor 1248	ND		ug/kg	38.7	--	1
Aroclor 1262	ND		ug/kg	19.4	--	1
Aroclor 1268	ND		ug/kg	19.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	86		30-150
Decachlorobiphenyl	88		30-150
2,4,5,6-Tetrachloro-m-xylene	79		30-150
Decachlorobiphenyl	106		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-13	Date Collected:	07/13/12 09:10
Client ID:	CRACK-2	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 13:00
Analytical Date:	07/18/12 19:18	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	99%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1254	224		ug/kg	58.0	--	1
Aroclor 1260	368		ug/kg	38.7	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	86		30-150
Decachlorobiphenyl	88		30-150
2,4,5,6-Tetrachloro-m-xylene	79		30-150
Decachlorobiphenyl	106		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-14	Date Collected:	07/13/12 09:30
Client ID:	CMU-H-1	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 13:00
Analytical Date:	07/18/12 19:32	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.7	--	1
Aroclor 1221	ND		ug/kg	56.7	--	1
Aroclor 1232	ND		ug/kg	56.7	--	1
Aroclor 1242	ND		ug/kg	56.7	--	1
Aroclor 1248	ND		ug/kg	37.8	--	1
Aroclor 1254	ND		ug/kg	56.7	--	1
Aroclor 1260	181		ug/kg	37.8	--	1
Aroclor 1262	ND		ug/kg	18.9	--	1
Aroclor 1268	ND		ug/kg	18.9	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	99		30-150
Decachlorobiphenyl	93		30-150
2,4,5,6-Tetrachloro-m-xylene	107		30-150
Decachlorobiphenyl	107		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-15	Date Collected:	07/13/12 09:30
Client ID:	CMU-H-1_DUP	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 13:00
Analytical Date:	07/18/12 19:45	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	55.9	--	1
Aroclor 1221	ND		ug/kg	55.9	--	1
Aroclor 1232	ND		ug/kg	55.9	--	1
Aroclor 1242	ND		ug/kg	55.9	--	1
Aroclor 1248	ND		ug/kg	37.2	--	1
Aroclor 1254	ND		ug/kg	55.9	--	1
Aroclor 1260	524		ug/kg	37.2	--	1
Aroclor 1262	ND		ug/kg	18.6	--	1
Aroclor 1268	ND		ug/kg	18.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	89		30-150
Decachlorobiphenyl	98		30-150
2,4,5,6-Tetrachloro-m-xylene	96		30-150
Decachlorobiphenyl	104		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-16	Date Collected:	07/13/12 09:40
Client ID:	CMU-H-2	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 13:00
Analytical Date:	07/18/12 19:59	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.9	--	1
Aroclor 1221	ND		ug/kg	56.9	--	1
Aroclor 1232	ND		ug/kg	56.9	--	1
Aroclor 1242	ND		ug/kg	56.9	--	1
Aroclor 1248	ND		ug/kg	38.0	--	1
Aroclor 1254	ND		ug/kg	56.9	--	1
Aroclor 1260	148		ug/kg	38.0	--	1
Aroclor 1262	ND		ug/kg	19.0	--	1
Aroclor 1268	ND		ug/kg	19.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	83		30-150
Decachlorobiphenyl	102		30-150
2,4,5,6-Tetrachloro-m-xylene	89		30-150
Decachlorobiphenyl	103		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-17	Date Collected:	07/13/12 09:45
Client ID:	CMU-H-3	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 13:00
Analytical Date:	07/18/12 20:13	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.5	--	1
Aroclor 1221	ND		ug/kg	56.5	--	1
Aroclor 1232	ND		ug/kg	56.5	--	1
Aroclor 1242	ND		ug/kg	56.5	--	1
Aroclor 1248	ND		ug/kg	37.7	--	1
Aroclor 1254	ND		ug/kg	56.5	--	1
Aroclor 1260	56.4		ug/kg	37.7	--	1
Aroclor 1262	ND		ug/kg	18.8	--	1
Aroclor 1268	ND		ug/kg	18.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	101		30-150
Decachlorobiphenyl	111		30-150
2,4,5,6-Tetrachloro-m-xylene	107		30-150
Decachlorobiphenyl	116		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-18	Date Collected:	07/13/12 09:50
Client ID:	CMU-H-4	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 13:00
Analytical Date:	07/18/12 21:21	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.6	--	1
Aroclor 1221	ND		ug/kg	58.6	--	1
Aroclor 1232	ND		ug/kg	58.6	--	1
Aroclor 1242	ND		ug/kg	58.6	--	1
Aroclor 1248	ND		ug/kg	39.1	--	1
Aroclor 1254	ND		ug/kg	58.6	--	1
Aroclor 1260	ND		ug/kg	39.1	--	1
Aroclor 1262	ND		ug/kg	19.5	--	1
Aroclor 1268	ND		ug/kg	19.5	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	77		30-150
Decachlorobiphenyl	107		30-150
2,4,5,6-Tetrachloro-m-xylene	84		30-150
Decachlorobiphenyl	113		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-19	Date Collected:	07/13/12 09:55
Client ID:	CMU-H-5	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 13:00
Analytical Date:	07/18/12 21:34	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.5	--	1
Aroclor 1221	ND		ug/kg	56.5	--	1
Aroclor 1232	ND		ug/kg	56.5	--	1
Aroclor 1242	ND		ug/kg	56.5	--	1
Aroclor 1248	ND		ug/kg	37.7	--	1
Aroclor 1254	ND		ug/kg	56.5	--	1
Aroclor 1260	67.9		ug/kg	37.7	--	1
Aroclor 1262	ND		ug/kg	18.8	--	1
Aroclor 1268	ND		ug/kg	18.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	73		30-150
Decachlorobiphenyl	108		30-150
2,4,5,6-Tetrachloro-m-xylene	78		30-150
Decachlorobiphenyl	113		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212503

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212503-20	Date Collected:	07/13/12 10:00
Client ID:	CMU-H-6	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 13:00
Analytical Date:	07/18/12 21:48	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.7	--	1
Aroclor 1221	ND		ug/kg	56.7	--	1
Aroclor 1232	ND		ug/kg	56.7	--	1
Aroclor 1242	ND		ug/kg	56.7	--	1
Aroclor 1248	ND		ug/kg	37.8	--	1
Aroclor 1254	ND		ug/kg	56.7	--	1
Aroclor 1260	184		ug/kg	37.8	--	1
Aroclor 1262	ND		ug/kg	18.9	--	1
Aroclor 1268	ND		ug/kg	18.9	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	100		30-150
Decachlorobiphenyl	118		30-150
2,4,5,6-Tetrachloro-m-xylene	107		30-150
Decachlorobiphenyl	125		30-150

Project Name: MBTA/LECHMERE

Project Number: P2814

Lab Number: L1212503

Report Date: 07/20/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/18/12 20:26
Analyst: KB

Extraction Method: EPA 3540C
Extraction Date: 07/17/12 11:52
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/18/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/18/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-20 Batch: WG548897-1					
Aroclor 1016	ND		ug/kg	59.4	--
Aroclor 1221	ND		ug/kg	59.4	--
Aroclor 1232	ND		ug/kg	59.4	--
Aroclor 1242	ND		ug/kg	59.4	--
Aroclor 1248	ND		ug/kg	39.6	--
Aroclor 1254	ND		ug/kg	59.4	--
Aroclor 1260	ND		ug/kg	39.6	--
Aroclor 1262	ND		ug/kg	19.8	--
Aroclor 1268	ND		ug/kg	19.8	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	86		30-150
Decachlorobiphenyl	101		30-150
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	104		30-150

Lab Control Sample Analysis
Batch Quality Control

Project Name: MBTA/LECHMERE
Project Number: P2814
Lab Number: L1212503
Report Date: 07/20/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-20 Batch: WG548897-2 WG548897-3								
Aroclor 1016	76		64		40-140	17		30
Aroclor 1260	80		72		40-140	11		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	95		80		30-150
Decachlorobiphenyl	104		96		30-150
2,4,5,6-Tetrachloro-m-xylene	99		83		30-150
Decachlorobiphenyl	108		100		30-150

INORGANICS
&
MISCELLANEOUS

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-01
Client ID: CMU-D-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 08:00
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-02
Client ID: CMU-D-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 08:05
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-03
Client ID: CMU-D-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 08:10
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-04
Client ID: CMU-D-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 08:15
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-05
Client ID: CMU-D-7
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 08:20
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-06
Client ID: CMU-D-8
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 08:25
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-07
Client ID: CMU-E-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 08:40
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-08
Client ID: CMU-E-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 08:45
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-09
Client ID: CMU-E-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 08:50
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-10
Client ID: CMU-E-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 08:55
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-11
Client ID: CMU-E-7
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 09:00
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-12
Client ID: CMU-E-8
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 09:05
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-13
Client ID: CRACK-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 09:10
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	99		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-14
Client ID: CMU-H-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 09:30
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-15
Client ID: CMU-H-1_DUP
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 09:30
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-16
Client ID: CMU-H-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 09:40
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-17
Client ID: CMU-H-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 09:45
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-18
Client ID: CMU-H-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 09:50
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-19
Client ID: CMU-H-5
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 09:55
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212503-20
Client ID: CMU-H-6
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:00
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 19:15	30,2540G	RD

Lab Duplicate Analysis
Batch Quality Control

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-20 QC Batch ID: WG548361-1 QC Sample: L1212503-01 Client ID: CMU-D-1						
Solids, Total	100	100	%	0		20

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal

Cooler	
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1212503-01A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-02A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-03A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-04A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-05A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-06A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-07A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-08A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-09A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-10A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-11A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-12A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-13A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-14A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-15A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-16A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-17A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-18A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212503-19A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)

*Values in parentheses indicate holding time in days

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212503
Report Date: 07/20/12

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1212503-20A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)

Container Comments

L1212503-20A

*Values in parentheses indicate holding time in days

Project Name:	MBTA/LECHMERE	**Lab Number:**	L1212503
Project Number:	P2814	**Report Date:**	07/20/12

GLOSSARY

Acronyms

EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NI	- Not Ignitable.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit.
C	- Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
D	- Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
E	- Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
G	- The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.
H	- The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
I	- The RPD between the results for the two columns exceeds the method-specified criteria; however, the lower value has been reported due to obvious interference.
M	- Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
NJ	- Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

Report Format: Data Usability Report

Project Name:	MBTA/LECHMERE	**Lab Number:**	L1212503
Project Number:	P2814	**Report Date:**	07/20/12

Data Qualifiers

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name: MBTA/LECHMERE **Lab Number:** L1212503
Project Number: P2814 **Report Date:** 07/20/12

REFERENCES

30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certificate/Approval Program Summary

Last revised May 11, 2012 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. ***NELAP Accredited Solid Waste/Soil.***

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP) 504.1, Ethylene Dibromide (EDB) 504.1, 1,4-Dioxane (Mod 8270). Microbiology Parameters: Total Coliform-MF mEndo (SM9222B), Total Coliform – Colilert (SM9223 P/A), E. Coli. – Colilert (SM9223 P/A), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D, Fecal Coliform-EC Medium 9221E).

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, O-Phosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics, TPH (HEM/SGT), Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH. Microbiology Parameters: Total Coliform – MF mEndo (SM9222B), Total Coliform – MTF (SM9221B), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform – A-1 Broth (SM9221E), Enterolert, E.Coli 9223.

Solid Waste/Soil (Inorganic Parameters: pH, Sulfide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), SPLP Leach (1312 metals only), Reactivity. Organic Parameters: PCBs, PCBs in Oil, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH, Dicamba, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Dalapon, Volatile Organics, Acid Extractables (Phenols), Benzidines, Phthalates, Nitrosamines, Nitroaromatics & Cyclic Ketones, PAHs, Haloethers, Chlorinated Hydrocarbons.)

Maine Department of Human Services Certificate/Lab ID: 2009024.
Drinking Water (Inorganic Parameters: SM9215B, 9222D, 9223B, EPA 180.1, 353.2, SM2130B, 2320B, 2540C, 4500Cl-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H+B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1, EPA 300.0. Organic Parameters: 504.1, 524.2.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, SM2320B, 2510B, 2540C, 2540D, 426C, 4500Cl-D, 4500Cl-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NO3-F, 4500P-B, 4500P-E, 5210B, 5220D, 5310C, 9010B, 9040B, 9030B, 7470A, 7196A, 2340B, EPA 200.7, 6010B, 200.8, 6020, 245.1, 1311, 1312, 3005A, Enterolert, 9223D, 9222D. Organic Parameters: 608, 624, 625, 8081A, 8082, 8330, 8151A, 8260B, 8270C, 3510C, 3630C, 5030B, ME-DRO, ME-GRO, MA-EPH, MA-VPH.)

Solid Waste/Soil (Inorganic Parameters: 9010B, 9012A, 9014A, 9030B, 9040B, 9045C, 6010B, 7471A, 7196A, 9050A, 1010, 1030, 9065, 1311, 1312, 3005A, 3050B. Organic Parameters: ME-DRO, ME-GRO, MA-EPH, MA-VPH, 8260B, 8270C, 8330, 8151A, 8081A, 8082, 3540C, 3546, 3580A, 3630C, 5030B, 5035.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.
*Drinking Water (*Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl) (EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Fluoride, Sulfate); (EPA 353.2 for: Nitrate-N, Nitrite-N); (SM4500NO3-F for: Nitrate-N and Nitrite-N); 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, 2320B, SM2540C, SM4500H-B. Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics); (504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), EPA 332. Microbiology Parameters: SM9215B; ENZ. SUB. SM9223; ColilertQT SM9223B; MF-SM9222D.)

*Non-Potable Water (*Inorganic Parameters:, (EPA 200.8 for: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn); (EPA 200.7 for: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn); 245.1, SM4500H,B, EPA 120.1,

SM2510B, 2540C, 2340B, 2320B, 4500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia-N), LACHAT 10-107-06-1-B for Ammonia-N, SM4500NO3-F, 353.2 for Nitrate-N, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 5310C, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.
Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics),(608 for: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT,Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs-Water), (EPA 625 for SVOC Acid Extractables and SVOC Base/Neutral Extractables), 600/4-81-045-PCB-Oil. Microbiology Parameters: (ColilertQT SM9223B; Enterolert-QT: SM9222D-MF.)

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM 9222B, 9223B, 9215B, EPA 200.7, 200.8, 245.2, 300.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 332.0. Organic Parameters: 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 3005A, 200.7, 200.8, 245.1, 245.2, SW-846 6010B, 6010C, 6020, 6020A, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 350.2, 351.1, 353.2, 410.4, 420.1, 426C, 1664A, SW-846 9010B, 9030B, 9040B, SM426C, SM2120B, 2310B, 2320B, 2540B, 2540D, 4500H+B, 4500CL-E, 4500CN-E, 4500NH3-H, 4500NO3-F, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 5220D, 2510B, 2540C, 4500F-C, 5310C, 5540C, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D. Organic Parameters: SW-846 3510C, 3630C, 5030B, 8260B, 8270C, 8270D, 8330, EPA 624, 625, 608, SW-846 8082, 8081A, 8081B, 8151A.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 6010C, 7196A, 7471A, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040B, 9045C, 9050, 9065,1311, 1312, 3005A, 3050B, 3060A. Organic Parameters: SW-846 3540C, 3546, 3550B, 3580A, 3630C, 5030B, 5035, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330, 8151A, 8015B, 8082, 8082A, 8081A, 8081B.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9223B, 9215B, 4500CN-CE, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 200.8, 245.2, 2540C, SM2120B, 2320B, 2510B, 5310C, SM4500H-B. Organic Parameters: EPA 332, 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500Cl-E, EPA 300.0, SM2120B, 2340B, SM4500F-BC, EPA 200.7, 200.8, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM510ABC, SM4500P-B5+E, 2540B, 2540C, 2540D, 2540G, EPA 120.1, SM2510B, SM15 426C, 9222D, 9221B, 9221C, 9221E, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, 350.2, SW-846 1312, 7470A, 5540C, SM4500H-B, 4500SO3-B, SM3500Cr-D, 4500CN-CE, EPA 245.1, 245.2, SW-846 9040B, 3005A, 3015, EPA 6010B, 6010C, 6020, 6020A, 7196A, 3060A, SW-846 9010B, 9030B. Organic Parameters: SW-846 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3510C, EPA 608, 624, 625, SW-846 3630C, 5030B, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 1,4-Dioxane by NJ Modified 8270, 8015B, NJ OQA-QAM-025 Rev.7, NJ EPH.)

Solid & Chemical Materials (Inorganic Parameters: SW-846, 6010B, 6010C,6020, 6020A, 7196A, 3060A, 9010B, 9030B, 1010, 1030, 1311, 1312, 3005A, 3050B, 7471A, 7471B, 9014, 9012A, 9040B, 9045C, 9050A, 9065. Organic Parameters: SW-846 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3540C, 3546, 3580A, 3630C, 5030B, 5035L, 5035H, NJ OQA-QAM-025 Rev.7, NJ EPH.)

New York Department of Health Certificate/Lab ID: 11148. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9223B, 9222B, 9215B, EPA 200.8, 200.7, 245.2, SM5310C, EPA 332.0, SM2320B, EPA 300.0, SM2120B, 4500CN-E, 4500F-C, 4500NO3-F, 2540C, SM 2510B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222B, 9215B, 5210B, 5310C, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, SM4500CL-E, 4500F-C, SM15 426C, EPA 350.1, SM4500NH3-BH, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, SM4500-NO3-F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6010C, 6020, 6020A, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, LACHAT 10-204-00-1-A, 4500CN-CE, EPA 1664A, EPA 420.1, SM14 510C, EPA 120.1, SM2510B, SM4500S-D, SM5540C, EPA 3005A, 3015, 9010B, 9030B. Organic Parameters: EPA 624, 8260B, 8270C, 8270D, 625, 608, 8081A, 8081B, 8151A, 8330, 8082, 8082A, EPA 3510C, 5030B.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010, 1030, EPA 6010B, 6010C, 7196A, 7471A, 7471B, 9012A, 9014, 9065, 9050A, EPA 1311, 1312, 3005A, 3050B, 9010B, 9030B. Organic Parameters: EPA 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8015B, 8015C, 8081A, 8081B, 8151A, 8330, 8082 8082A, 3540C, 3546, 3580, 3580A, 5030B, 5035.)

North Carolina Department of the Environment and Natural Resources Certificate/Lab ID : 666. Organic Parameters: MA-EPH, MA-VPH.

Drinking Water Program Certificate/Lab ID: 25700. (Inorganic Parameters: Chloride EPA 300.0. Organic Parameters: 524.2)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. ***NELAP Accredited.***
Drinking Water (Organic Parameters: EPA 524.2, 504.1)

Non-Potable Water (Inorganic Parameters: EPA 1312, 3005A, 200.7, 410.4, 1664A, SM2540D, 5210B, 5220D, 4500-P,BE. Organic Parameters: EPA 3510C, 3630C, 5030B, 625, 624, 608, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330)

Solid & Hazardous Waste (Inorganic Parameters: EPA 350.1, 1010, 1030, 1311, 1312, 3050B, 3060A, 6010B, 6010C, 7196A, 7471A, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065, SM 4500NH3-H. Organic Parameters: 3540C, 3546, 3580A, 3630C, 5035, 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. ***NELAP Accredited via NY-DOH.***
Refer to MA-DEP Certificate for Potable and Non-Potable Water.
Refer to NJ-DEP Certificate for Potable and Non-Potable Water.

Texas Commisson on Environmental Quality Certificate/Lab ID: T104704476-09-1. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664, 200.7, 200.8, 245.1, 245.2, 300.0, 350.1, 351.1, 353.2, 410.4, 420.1, 6010, 6020, 7196, 7470, 9040, SM 2120B, 2310B, 2320B, 2510B, 2540B, 2540C, 2540D, 426C, 4500CL-E, 4500CN-E, 4500F-C, 4500H+B, 4500NH3-H, 4500NO2B, 4500P-E, 4500 S2¯D, 510C, 5210B, 5220D, 5310C, 5540C. Organic Parameters: EPA 608, 624, 625, 8081, 8082, 8151, 8260, 8270, 8330.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1311, 1312, 9012, 9014, 9040, 9045, 9050, 9065.)

Virginia Division of Consolidated Laboratory Services Certificate/Lab ID: 460195. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 3005A,3015,1312,6010B,6010C,SM4500S-D, SM4500-CN-CE, Lachat 10-204-00-1-X. Organic Parameters: EPA 8260B)

Solid & Hazardous Waste (Inorganic Parameters: EPA 3050B, 1311, 1312, 6010B, 6010C, 9030B, 9010B, 9012A, 9014. Organic Parameters: EPA 5035, 5030B, 8260B, 8015B, 8015C.)

Department of Defense, L-A-B Certificate/Lab ID: L2217.
Drinking Water (Inorganic Parameters: SM 4500H-B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: EPA 200.7, 200.8, 6010B, 6010C, 6020, 6020A, 245.1, 245.2, 7470A, 9040B, 9010B, 180.1. 300.0, 332.0, 6860, 353.2, 410.4, 9060, 1664A, SM 4500CN-E, 4500H-B, 4500NO3-F, 4500CL-D, 5220D, 5310C, 2130B, 2320B, 2540C, 3005A, 3015, 9010B, 9056. Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A, 8082, 8082A, 8081A, 8081B, 3510C, 5030B, MassDEP EPH, MassDEP VPH.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 200.7, 6010B, 6010C, 7471A, 6860, 1311, 1312, 3050B, 7196A, 9010B, 9012A, 9040B, 9045C, 3500-CR-D, 4500CN-CE, 2540G, Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A/B-prep, 8082, 8082A, 8081A, 8081B, 3540C, 3546, 3580A, 5035A, MassDEP EPH, MassDEP VPH.)

The following analytes are not included in our current NELAP/TNI Scope of Accreditation:
EPA 8260B: Freon-113, 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene. **EPA 8330A:** PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT. **EPA 8270C:** Methyl naphthalene, Dimethyl naphthalene, Total Methylnapthalenes, Total Dimethylnaphthalenes, 1,4-Diphenylhydrazine (Azobenzene). **EPA 625:** 4-Chloroaniline, 4-Methylphenol. Total Phosphorus in a soil matrix, Chloride in a soil matrix, TKN in a soil matrix, NO2 in a soil matrix, NO3 in a soil matrix, SO4 in a soil matrix. **EPA 9071:** Total Petroleum Hydrocarbons, Oil & Grease

CHAIN OF CUSTODY

PAGE 1 OF 5

Date Rec'd in Lab: 7/13/12

ALPHA Job #: L1212503

ALPHA ANALYTICAL
Partic Class Chemistry
8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220
320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Name: MBTA/Lechmere
Project Location: ~~P2814~~ Cambridge
Project #: P2814
Project Manager: Matt Alger
ALPHA Quote #:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #: P2814

Client Information

Client: Nover Armstrong Assoc, Inc
Address: 124 Main St, Unit 266
Carver, MA 02330
Phone: 508-866-8383
Email: malger@noverarmstrong.com

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☒ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program TSCA Criteria

Additional Project Information:

Use Soxhlet Method

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☒ PCB ☐ PEST Soxhlet; TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO
Filtration
☐ Field
☐ Lab to do
Preservation
☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	☒ PCB	Sample Comments	TOTAL # BOTTLES
12503 01	CMU-D-1	7/13/12	8:00am	Concrete Powder	MA	1		1
02	CMU-D-2		8:05am			1		1
03	CMU-D-3		8:10am			1		1
04	CMU-D-4		8:15am			1		1
05	CMU-D-7		8:20am			1		1
06	CMU-D-8		8:25am			1		1
07	CMU-E-1		8:40am			1		1
08	CMU-E-2		8:45am			1		1
09	CMU-E-3		8:50am			1		1
10	CMU-E-4		8:55am			1		1
					Container Type	A		
					Preservative	A		

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7/13/12 15:20	[signature]	7/13/12 15:20

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

CHAIN OF CUSTODY

PAGE 2 OF 5

Date Rec'd in Lab: 7/13/12

ALPHA Job #: L1212503

ALPHA ANALYTICAL — World Class Chemistry

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Client Information

Client: Nover-Armstrong Assoc.
Address: 124 Main St, Unit 266
Carver, MA 02330
Phone: 508-866-8383
Email: malger@novearmstrong.com

Project Information

Project Name: MBTA/Ledmere
Project Location: Cambridge
Project #: P2814
Project Manager: Matt Alger
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO # P2814

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☒ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program TSCA Criteria

Additional Project Information:

Use Soxhlet Extraction

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☒ PCB ☐ PEST Soxhlet; TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	PCB	Sample Comments	TOTAL # BOTTLES
12503-11	CMU-E-7	7/13/12	9:00am	Concrete powder	MA	1		1
-12	CMU-E-8		9:05am			1		1
-13	CRACK-2		9:10am			1		1
-14	CMU-H-1		9:30am			1		1
-15	CMU-H-1_DUP		9:30am			1		1
-16	CMU-H-2		9:40am			1		1
-17	CMU-H-3		9:45am			1		1
-18	CMU-H-4		9:50am			1		1
-19	CMU-H-5		9:55am			1		1
-20	CMU-H-6		10:00am			1		1
				Container Type		A		
				Preservative		A		

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7/13/12 15:20	[signature]	7/13/12 1520

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

ANALYTICAL REPORT

Lab Number:	L1212504
Client:	Nover-Armstrong Associates 124 Main Street Unit 2GG Carver, MA 02330
ATTN:	Matt Alger
Phone:	(508) 866-8383
Project Name:	MBTA/LECHMERE
Project Number:	P2814
Report Date:	07/20/12

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), USDA (Permit #P-330-11-00240), NC (666), TX (T104704476), DOD (L2217), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L1212504-01	EQUIP BLANK-4	CAMBRIDGE	07/13/12 09:20
L1212504-02	CMU-H-7	CAMBRIDGE	07/13/12 10:05
L1212504-03	CMU-H-8	CAMBRIDGE	07/13/12 10:10
L1212504-04	CMU-I-1	CAMBRIDGE	07/13/12 10:20
L1212504-05	CMU-I-2	CAMBRIDGE	07/13/12 10:25
L1212504-06	CMU-I-3	CAMBRIDGE	07/13/12 10:30
L1212504-07	CMU-I-4	CAMBRIDGE	07/13/12 10:35
L1212504-08	CMU-I-5	CAMBRIDGE	07/13/12 10:40
L1212504-09	CMU-I-6	CAMBRIDGE	07/13/12 10:45
L1212504-10	CMU-I-7	CAMBRIDGE	07/13/12 10:50
L1212504-11	CMU-I-8	CAMBRIDGE	07/13/12 10:55
L1212504-12	CRACK-3	CAMBRIDGE	07/13/12 10:25
L1212504-13	CMU-I-8_DUP	CAMBRIDGE	07/13/12 10:55
L1212504-14	CMU-J-1	CAMBRIDGE	07/13/12 11:00
L1212504-15	CMU-J-2	CAMBRIDGE	07/13/12 11:05
L1212504-16	CMU-J-3	CAMBRIDGE	07/13/12 11:10
L1212504-17	CMU-J-4	CAMBRIDGE	07/13/12 11:15
L1212504-18	CMU-J-5	CAMBRIDGE	07/13/12 11:20
L1212504-19	CMU-J-6	CAMBRIDGE	07/13/12 11:25
L1212504-20	CMU-J-7	CAMBRIDGE	07/13/12 11:30
L1212504-21	CMU-J-8	CAMBRIDGE	07/13/12 11:35
L1212504-22	CMU-J-8_DUP	CAMBRIDGE	07/13/12 11:35
L1212504-23	EQUIP BLANK-5	CAMBRIDGE	07/13/12 12:00
L1212504-24	CRACK-4	CAMBRIDGE	07/13/12 12:15

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

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

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	YES
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	YES
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

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Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Performance criteria for CAM and RCP methods allow for some LCS compound failures to occur and still be within method compliance. In these instances, the specific failures are not narrated but are noted in the associated QC table. This information is also incorporated in the Data Usability format for our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples free of charge for 30 days from the date the project is completed. After 30 days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples.

Please contact Client Services at 800-624-9220 with any questions.

Project Name:	MBTA/LECHMERE	**Lab Number:**	L1212504
Project Number:	P2814	**Report Date:**	07/20/12

Case Narrative (continued)

MCP Related Narratives

Report Submission

All MCP required questions were answered with affirmative responses; therefore, there are no relevant protocol-specific QC and/or performance standard non-conformances to report.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Michelle M. Morris

Title: Technical Director/Representative

Date: 07/20/12

ORGANICS

PCBS

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-01	Date Collected:	07/13/12 09:20
Client ID:	EQUIP BLANK-4	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	97,8082	Extraction Date:	07/14/12 00:35
Analytical Date:	07/17/12 09:26	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
		Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/l	0.250	--	1
Aroclor 1221	ND		ug/l	0.250	--	1
Aroclor 1232	ND		ug/l	0.250	--	1
Aroclor 1242	ND		ug/l	0.250	--	1
Aroclor 1248	ND		ug/l	0.250	--	1
Aroclor 1254	ND		ug/l	0.250	--	1
Aroclor 1260	ND		ug/l	0.250	--	1
Aroclor 1262	ND		ug/l	0.250	--	1
Aroclor 1268	ND		ug/l	0.250	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	102		30-150
Decachlorobiphenyl	80		30-150
2,4,5,6-Tetrachloro-m-xylene	97		30-150
Decachlorobiphenyl	78		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-02	Date Collected:	07/13/12 10:05
Client ID:	CMU-H-7	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/18/12 22:02	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	55.9	--	1
Aroclor 1221	ND		ug/kg	55.9	--	1
Aroclor 1232	ND		ug/kg	55.9	--	1
Aroclor 1242	ND		ug/kg	55.9	--	1
Aroclor 1248	ND		ug/kg	37.2	--	1
Aroclor 1254	ND		ug/kg	55.9	--	1
Aroclor 1262	ND		ug/kg	18.6	--	1
Aroclor 1268	ND		ug/kg	18.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	78		30-150
Decachlorobiphenyl	90		30-150
2,4,5,6-Tetrachloro-m-xylene	82		30-150
Decachlorobiphenyl	99		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-02	Date Collected:	07/13/12 10:05
Client ID:	CMU-H-7	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/18/12 22:02	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	73.1		ug/kg	37.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	78		30-150
Decachlorobiphenyl	90		30-150
2,4,5,6-Tetrachloro-m-xylene	82		30-150
Decachlorobiphenyl	99		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-03	Date Collected:	07/13/12 10:10
Client ID:	CMU-H-8	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/18/12 22:15	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	55.8	--	1
Aroclor 1221	ND		ug/kg	55.8	--	1
Aroclor 1232	ND		ug/kg	55.8	--	1
Aroclor 1242	ND		ug/kg	55.8	--	1
Aroclor 1248	ND		ug/kg	37.2	--	1
Aroclor 1254	ND		ug/kg	55.8	--	1
Aroclor 1260	102		ug/kg	37.2	--	1
Aroclor 1262	ND		ug/kg	18.6	--	1
Aroclor 1268	ND		ug/kg	18.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	85		30-150
Decachlorobiphenyl	95		30-150
2,4,5,6-Tetrachloro-m-xylene	91		30-150
Decachlorobiphenyl	103		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-04	Date Collected:	07/13/12 10:20
Client ID:	CMU-I-1	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/18/12 22:29	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	59.3	--	1
Aroclor 1221	ND		ug/kg	59.3	--	1
Aroclor 1232	ND		ug/kg	59.3	--	1
Aroclor 1242	ND		ug/kg	59.3	--	1
Aroclor 1248	ND		ug/kg	39.5	--	1
Aroclor 1254	ND		ug/kg	59.3	--	1
Aroclor 1262	ND		ug/kg	19.8	--	1
Aroclor 1268	ND		ug/kg	19.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	79		30-150
Decachlorobiphenyl	90		30-150
2,4,5,6-Tetrachloro-m-xylene	83		30-150
Decachlorobiphenyl	92		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

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SAMPLE RESULTS

Lab ID:	L1212504-04	Date Collected:	07/13/12 10:20
Client ID:	CMU-I-1	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/18/12 22:29	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	428		ug/kg	39.5	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	79		30-150
Decachlorobiphenyl	90		30-150
2,4,5,6-Tetrachloro-m-xylene	83		30-150
Decachlorobiphenyl	92		30-150

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SAMPLE RESULTS

Lab ID:	L1212504-05	Date Collected:	07/13/12 10:25
Client ID:	CMU-I-2	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/18/12 22:43	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.9	--	1
Aroclor 1221	ND		ug/kg	58.9	--	1
Aroclor 1232	ND		ug/kg	58.9	--	1
Aroclor 1242	ND		ug/kg	58.9	--	1
Aroclor 1248	ND		ug/kg	39.3	--	1
Aroclor 1254	ND		ug/kg	58.9	--	1
Aroclor 1260	75.4		ug/kg	39.3	--	1
Aroclor 1262	ND		ug/kg	19.6	--	1
Aroclor 1268	ND		ug/kg	19.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	80		30-150
Decachlorobiphenyl	99		30-150
2,4,5,6-Tetrachloro-m-xylene	83		30-150
Decachlorobiphenyl	100		30-150

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SAMPLE RESULTS

Lab ID:	L1212504-06	Date Collected:	07/13/12 10:30
Client ID:	CMU-I-3	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/18/12 22:56	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.7	--	1
Aroclor 1221	ND		ug/kg	58.7	--	1
Aroclor 1232	ND		ug/kg	58.7	--	1
Aroclor 1242	ND		ug/kg	58.7	--	1
Aroclor 1248	ND		ug/kg	39.1	--	1
Aroclor 1254	ND		ug/kg	58.7	--	1
Aroclor 1260	107		ug/kg	39.1	--	1
Aroclor 1262	ND		ug/kg	19.6	--	1
Aroclor 1268	ND		ug/kg	19.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	99		30-150
2,4,5,6-Tetrachloro-m-xylene	95		30-150
Decachlorobiphenyl	103		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

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SAMPLE RESULTS

Lab ID:	L1212504-07	Date Collected:	07/13/12 10:35
Client ID:	CMU-I-4	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/18/12 23:10	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.7	--	1
Aroclor 1221	ND		ug/kg	58.7	--	1
Aroclor 1232	ND		ug/kg	58.7	--	1
Aroclor 1242	ND		ug/kg	58.7	--	1
Aroclor 1248	ND		ug/kg	39.1	--	1
Aroclor 1254	ND		ug/kg	58.7	--	1
Aroclor 1260	103		ug/kg	39.1	--	1
Aroclor 1262	ND		ug/kg	19.6	--	1
Aroclor 1268	ND		ug/kg	19.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	93		30-150
Decachlorobiphenyl	99		30-150
2,4,5,6-Tetrachloro-m-xylene	99		30-150
Decachlorobiphenyl	106		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

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SAMPLE RESULTS

Lab ID:	L1212504-08	Date Collected:	07/13/12 10:40
Client ID:	CMU-I-5	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/18/12 23:23	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.7	--	1
Aroclor 1221	ND		ug/kg	57.7	--	1
Aroclor 1232	ND		ug/kg	57.7	--	1
Aroclor 1242	ND		ug/kg	57.7	--	1
Aroclor 1248	ND		ug/kg	38.5	--	1
Aroclor 1254	ND		ug/kg	57.7	--	1
Aroclor 1260	40.0		ug/kg	38.5	--	1
Aroclor 1262	ND		ug/kg	19.2	--	1
Aroclor 1268	ND		ug/kg	19.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	85		30-150
Decachlorobiphenyl	95		30-150
2,4,5,6-Tetrachloro-m-xylene	89		30-150
Decachlorobiphenyl	100		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

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SAMPLE RESULTS

Lab ID:	L1212504-09	Date Collected:	07/13/12 10:45
Client ID:	CMU-I-6	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/18/12 23:37	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.7	--	1
Aroclor 1221	ND		ug/kg	56.7	--	1
Aroclor 1232	ND		ug/kg	56.7	--	1
Aroclor 1242	ND		ug/kg	56.7	--	1
Aroclor 1248	ND		ug/kg	37.8	--	1
Aroclor 1254	ND		ug/kg	56.7	--	1
Aroclor 1260	89.2		ug/kg	37.8	--	1
Aroclor 1262	ND		ug/kg	18.9	--	1
Aroclor 1268	ND		ug/kg	18.9	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	92		30-150
Decachlorobiphenyl	102		30-150
2,4,5,6-Tetrachloro-m-xylene	96		30-150
Decachlorobiphenyl	106		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

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SAMPLE RESULTS

Lab ID:	L1212504-10	Date Collected:	07/13/12 10:50
Client ID:	CMU-I-7	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/18/12 23:51	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.7	--	1
Aroclor 1221	ND		ug/kg	56.7	--	1
Aroclor 1232	ND		ug/kg	56.7	--	1
Aroclor 1242	ND		ug/kg	56.7	--	1
Aroclor 1248	ND		ug/kg	37.8	--	1
Aroclor 1254	ND		ug/kg	56.7	--	1
Aroclor 1260	57.5		ug/kg	37.8	--	1
Aroclor 1262	ND		ug/kg	18.9	--	1
Aroclor 1268	ND		ug/kg	18.9	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	92		30-150
Decachlorobiphenyl	100		30-150
2,4,5,6-Tetrachloro-m-xylene	98		30-150
Decachlorobiphenyl	102		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-11	Date Collected:	07/13/12 10:55
Client ID:	CMU-I-8	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/19/12 00:04	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.6	--	1
Aroclor 1221	ND		ug/kg	57.6	--	1
Aroclor 1232	ND		ug/kg	57.6	--	1
Aroclor 1242	ND		ug/kg	57.6	--	1
Aroclor 1248	ND		ug/kg	38.4	--	1
Aroclor 1254	ND		ug/kg	57.6	--	1
Aroclor 1260	100		ug/kg	38.4	--	1
Aroclor 1262	ND		ug/kg	19.2	--	1
Aroclor 1268	ND		ug/kg	19.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	98		30-150
Decachlorobiphenyl	108		30-150
2,4,5,6-Tetrachloro-m-xylene	105		30-150
Decachlorobiphenyl	116		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-12	Date Collected:	07/13/12 10:25
Client ID:	CRACK-3	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/19/12 00:18	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.7	--	1
Aroclor 1221	ND		ug/kg	58.7	--	1
Aroclor 1232	ND		ug/kg	58.7	--	1
Aroclor 1242	ND		ug/kg	58.7	--	1
Aroclor 1248	ND		ug/kg	39.1	--	1
Aroclor 1254	ND		ug/kg	58.7	--	1
Aroclor 1260	80.9		ug/kg	39.1	--	1
Aroclor 1262	ND		ug/kg	19.6	--	1
Aroclor 1268	ND		ug/kg	19.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	87		30-150
Decachlorobiphenyl	107		30-150
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	112		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-13	Date Collected:	07/13/12 10:55
Client ID:	CMU-I-8_DUP	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 10:09
Analytical Date:	07/19/12 00:31	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.1	--	1
Aroclor 1221	ND		ug/kg	57.1	--	1
Aroclor 1232	ND		ug/kg	57.1	--	1
Aroclor 1242	ND		ug/kg	57.1	--	1
Aroclor 1248	ND		ug/kg	38.1	--	1
Aroclor 1254	ND		ug/kg	57.1	--	1
Aroclor 1260	112		ug/kg	38.1	--	1
Aroclor 1262	ND		ug/kg	19.0	--	1
Aroclor 1268	ND		ug/kg	19.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	100		30-150
Decachlorobiphenyl	110		30-150
2,4,5,6-Tetrachloro-m-xylene	105		30-150
Decachlorobiphenyl	117		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-14	Date Collected:	07/13/12 11:00
Client ID:	CMU-J-1	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:38
Analytical Date:	07/19/12 00:45	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.6	--	1
Aroclor 1221	ND		ug/kg	56.6	--	1
Aroclor 1232	ND		ug/kg	56.6	--	1
Aroclor 1242	ND		ug/kg	56.6	--	1
Aroclor 1248	ND		ug/kg	37.7	--	1
Aroclor 1254	ND		ug/kg	56.6	--	1
Aroclor 1260	449		ug/kg	37.7	--	1
Aroclor 1262	ND		ug/kg	18.9	--	1
Aroclor 1268	ND		ug/kg	18.9	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	94		30-150
Decachlorobiphenyl	106		30-150
2,4,5,6-Tetrachloro-m-xylene	100		30-150
Decachlorobiphenyl	108		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-15	Date Collected:	07/13/12 11:05
Client ID:	CMU-J-2	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:38
Analytical Date:	07/19/12 00:59	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.9	--	1
Aroclor 1221	ND		ug/kg	57.9	--	1
Aroclor 1232	ND		ug/kg	57.9	--	1
Aroclor 1242	ND		ug/kg	57.9	--	1
Aroclor 1248	ND		ug/kg	38.6	--	1
Aroclor 1254	ND		ug/kg	57.9	--	1
Aroclor 1262	ND		ug/kg	19.3	--	1
Aroclor 1268	ND		ug/kg	19.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	98		30-150
Decachlorobiphenyl	109		30-150
2,4,5,6-Tetrachloro-m-xylene	104		30-150
Decachlorobiphenyl	112		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-15	Date Collected:	07/13/12 11:05
Client ID:	CMU-J-2	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:38
Analytical Date:	07/19/12 00:59	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	500		ug/kg	38.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	98		30-150
Decachlorobiphenyl	109		30-150
2,4,5,6-Tetrachloro-m-xylene	104		30-150
Decachlorobiphenyl	112		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-16	Date Collected:	07/13/12 11:10
Client ID:	CMU-J-3	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:38
Analytical Date:	07/19/12 02:07	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	98%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.0	--	1
Aroclor 1221	ND		ug/kg	57.0	--	1
Aroclor 1232	ND		ug/kg	57.0	--	1
Aroclor 1242	ND		ug/kg	57.0	--	1
Aroclor 1248	ND		ug/kg	38.0	--	1
Aroclor 1254	ND		ug/kg	57.0	--	1
Aroclor 1260	68.4		ug/kg	38.0	--	1
Aroclor 1262	ND		ug/kg	19.0	--	1
Aroclor 1268	ND		ug/kg	19.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	57		30-150
Decachlorobiphenyl	61		30-150
2,4,5,6-Tetrachloro-m-xylene	59		30-150
Decachlorobiphenyl	63		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-17	Date Collected:	07/13/12 11:15
Client ID:	CMU-J-4	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:38
Analytical Date:	07/19/12 02:20	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.5	--	1
Aroclor 1221	ND		ug/kg	58.5	--	1
Aroclor 1232	ND		ug/kg	58.5	--	1
Aroclor 1242	ND		ug/kg	58.5	--	1
Aroclor 1248	ND		ug/kg	39.0	--	1
Aroclor 1254	ND		ug/kg	58.5	--	1
Aroclor 1260	60.3		ug/kg	39.0	--	1
Aroclor 1262	ND		ug/kg	19.5	--	1
Aroclor 1268	ND		ug/kg	19.5	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	100		30-150
Decachlorobiphenyl	111		30-150
2,4,5,6-Tetrachloro-m-xylene	105		30-150
Decachlorobiphenyl	117		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-18	Date Collected:	07/13/12 11:20
Client ID:	CMU-J-5	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:38
Analytical Date:	07/19/12 02:34	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.2	--	1
Aroclor 1221	ND		ug/kg	58.2	--	1
Aroclor 1232	ND		ug/kg	58.2	--	1
Aroclor 1242	ND		ug/kg	58.2	--	1
Aroclor 1248	ND		ug/kg	38.8	--	1
Aroclor 1254	ND		ug/kg	58.2	--	1
Aroclor 1260	57.5		ug/kg	38.8	--	1
Aroclor 1262	ND		ug/kg	19.4	--	1
Aroclor 1268	ND		ug/kg	19.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	103		30-150
Decachlorobiphenyl	109		30-150
2,4,5,6-Tetrachloro-m-xylene	109		30-150
Decachlorobiphenyl	119		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-19	Date Collected:	07/13/12 11:25
Client ID:	CMU-J-6	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:38
Analytical Date:	07/19/12 02:47	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	56.1	--	1
Aroclor 1221	ND		ug/kg	56.1	--	1
Aroclor 1232	ND		ug/kg	56.1	--	1
Aroclor 1242	ND		ug/kg	56.1	--	1
Aroclor 1248	ND		ug/kg	37.4	--	1
Aroclor 1254	ND		ug/kg	56.1	--	1
Aroclor 1260	128		ug/kg	37.4	--	1
Aroclor 1262	ND		ug/kg	18.7	--	1
Aroclor 1268	ND		ug/kg	18.7	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	92		30-150
Decachlorobiphenyl	104		30-150
2,4,5,6-Tetrachloro-m-xylene	98		30-150
Decachlorobiphenyl	108		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-20	Date Collected:	07/13/12 11:30
Client ID:	CMU-J-7	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:38
Analytical Date:	07/19/12 03:01	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.4	--	1
Aroclor 1221	ND		ug/kg	57.4	--	1
Aroclor 1232	ND		ug/kg	57.4	--	1
Aroclor 1242	ND		ug/kg	57.4	--	1
Aroclor 1248	ND		ug/kg	38.2	--	1
Aroclor 1254	ND		ug/kg	57.4	--	1
Aroclor 1260	91.4		ug/kg	38.2	--	1
Aroclor 1262	ND		ug/kg	19.1	--	1
Aroclor 1268	ND		ug/kg	19.1	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	100		30-150
Decachlorobiphenyl	106		30-150
2,4,5,6-Tetrachloro-m-xylene	106		30-150
Decachlorobiphenyl	111		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-21	Date Collected:	07/13/12 11:35
Client ID:	CMU-J-8	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 11:38
Analytical Date:	07/19/12 03:15	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.8	--	1
Aroclor 1221	ND		ug/kg	58.8	--	1
Aroclor 1232	ND		ug/kg	58.8	--	1
Aroclor 1242	ND		ug/kg	58.8	--	1
Aroclor 1248	ND		ug/kg	39.2	--	1
Aroclor 1254	ND		ug/kg	58.8	--	1
Aroclor 1260	96.8		ug/kg	39.2	--	1
Aroclor 1262	ND		ug/kg	19.6	--	1
Aroclor 1268	ND		ug/kg	19.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	101		30-150
Decachlorobiphenyl	107		30-150
2,4,5,6-Tetrachloro-m-xylene	108		30-150
Decachlorobiphenyl	113		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-22	Date Collected:	07/13/12 11:35
Client ID:	CMU-J-8_DUP	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 14:43
Analytical Date:	07/19/12 23:15	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.4	--	1
Aroclor 1221	ND		ug/kg	58.4	--	1
Aroclor 1232	ND		ug/kg	58.4	--	1
Aroclor 1242	ND		ug/kg	58.4	--	1
Aroclor 1248	ND		ug/kg	38.9	--	1
Aroclor 1254	ND		ug/kg	58.4	--	1
Aroclor 1260	88.0		ug/kg	38.9	--	1
Aroclor 1262	ND		ug/kg	19.4	--	1
Aroclor 1268	ND		ug/kg	19.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	111		30-150
Decachlorobiphenyl	113		30-150
2,4,5,6-Tetrachloro-m-xylene	103		30-150
Decachlorobiphenyl	102		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-23	Date Collected:	07/13/12 12:00
Client ID:	EQUIP BLANK-5	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	97,8082	Extraction Date:	07/14/12 00:35
Analytical Date:	07/17/12 09:39	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/15/12
		Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/15/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/l	0.250	--	1
Aroclor 1221	ND		ug/l	0.250	--	1
Aroclor 1232	ND		ug/l	0.250	--	1
Aroclor 1242	ND		ug/l	0.250	--	1
Aroclor 1248	ND		ug/l	0.250	--	1
Aroclor 1254	ND		ug/l	0.250	--	1
Aroclor 1260	ND		ug/l	0.250	--	1
Aroclor 1262	ND		ug/l	0.250	--	1
Aroclor 1268	ND		ug/l	0.250	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	106		30-150
Decachlorobiphenyl	104		30-150
2,4,5,6-Tetrachloro-m-xylene	102		30-150
Decachlorobiphenyl	101		30-150

Project Name: MBTA/LECHMERE **Lab Number:** L1212504

Project Number: P2814 **Report Date:** 07/20/12

SAMPLE RESULTS

Lab ID:	L1212504-24	Date Collected:	07/13/12 12:15
Client ID:	CRACK-4	Date Received:	07/13/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/17/12 14:43
Analytical Date:	07/19/12 23:28	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.8	--	1
Aroclor 1221	ND		ug/kg	57.8	--	1
Aroclor 1232	ND		ug/kg	57.8	--	1
Aroclor 1242	ND		ug/kg	57.8	--	1
Aroclor 1248	ND		ug/kg	38.5	--	1
Aroclor 1254	ND		ug/kg	57.8	--	1
Aroclor 1260	ND		ug/kg	38.5	--	1
Aroclor 1262	ND		ug/kg	19.3	--	1
Aroclor 1268	ND		ug/kg	19.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	119		30-150
Decachlorobiphenyl	118		30-150
2,4,5,6-Tetrachloro-m-xylene	112		30-150
Decachlorobiphenyl	108		30-150

Project Name: MBTA/LECHMERE

Project Number: P2814

Lab Number: L1212504

Report Date: 07/20/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/17/12 06:19
Analyst: BA

Extraction Method: EPA 3510C
Extraction Date: 07/14/12 00:35
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/15/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/15/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01,23 Batch: WG548400-1					
Aroclor 1016	ND		ug/l	0.250	--
Aroclor 1221	ND		ug/l	0.250	--
Aroclor 1232	ND		ug/l	0.250	--
Aroclor 1242	ND		ug/l	0.250	--
Aroclor 1248	ND		ug/l	0.250	--
Aroclor 1254	ND		ug/l	0.250	--
Aroclor 1260	ND		ug/l	0.250	--
Aroclor 1262	ND		ug/l	0.250	--
Aroclor 1268	ND		ug/l	0.250	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	87		30-150
Decachlorobiphenyl	87		30-150
2,4,5,6-Tetrachloro-m-xylene	78		30-150
Decachlorobiphenyl	96		30-150

Project Name: MBTA/LECHMERE

Project Number: P2814

Lab Number: L1212504

Report Date: 07/20/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/19/12 01:12
Analyst: KB

Extraction Method: EPA 3540C
Extraction Date: 07/17/12 10:09
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/18/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/18/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 02-21 Batch: WG548862-1					
Aroclor 1016	ND		ug/kg	59.6	--
Aroclor 1221	ND		ug/kg	59.6	--
Aroclor 1232	ND		ug/kg	59.6	--
Aroclor 1242	ND		ug/kg	59.6	--
Aroclor 1248	ND		ug/kg	39.8	--
Aroclor 1254	ND		ug/kg	59.6	--
Aroclor 1260	ND		ug/kg	39.8	--
Aroclor 1262	ND		ug/kg	19.9	--
Aroclor 1268	ND		ug/kg	19.9	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	97		30-150
2,4,5,6-Tetrachloro-m-xylene	95		30-150
Decachlorobiphenyl	103		30-150

Project Name: MBTA/LECHMERE

Project Number: P2814

Lab Number: L1212504

Report Date: 07/20/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/19/12 23:41
Analyst: KB

Extraction Method: EPA 3540C
Extraction Date: 07/17/12 14:43
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/18/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/18/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 22,24 Batch: WG548941-1					
Aroclor 1016	ND		ug/kg	59.0	--
Aroclor 1221	ND		ug/kg	59.0	--
Aroclor 1232	ND		ug/kg	59.0	--
Aroclor 1242	ND		ug/kg	59.0	--
Aroclor 1248	ND		ug/kg	39.4	--
Aroclor 1254	ND		ug/kg	59.0	--
Aroclor 1260	ND		ug/kg	39.4	--
Aroclor 1262	ND		ug/kg	19.7	--
Aroclor 1268	ND		ug/kg	19.7	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	117		30-150
Decachlorobiphenyl	120		30-150
2,4,5,6-Tetrachloro-m-xylene	111		30-150
Decachlorobiphenyl	111		30-150

Lab Control Sample Analysis
Batch Quality Control

Project Name: MBTA/LECHMERE
Project Number: P2814
Lab Number: L1212504
Report Date: 07/20/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01,23 Batch: WG548400-2 WG548400-3								
Aroclor 1016	82		76		40-140	8		20
Aroclor 1260	74		76		40-140	3		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	93		82		30-150
Decachlorobiphenyl	90		88		30-150
2,4,5,6-Tetrachloro-m-xylene	87		77		30-150
Decachlorobiphenyl	99		91		30-150

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 02-21 Batch: WG548862-2 WG548862-3								
Aroclor 1016	70		74		40-140	6		30
Aroclor 1260	72		78		40-140	8		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	83		87		30-150
Decachlorobiphenyl	90		97		30-150
2,4,5,6-Tetrachloro-m-xylene	85		90		30-150
Decachlorobiphenyl	94		101		30-150

Lab Control Sample Analysis
Batch Quality Control

Project Name: MBTA/LECHMERE
Project Number: P2814
Lab Number: L1212504
Report Date: 07/20/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 22,24 Batch: WG548941-2 WG548941-3								
Aroclor 1016	75		69		40-140	8		30
Aroclor 1260	86		83		40-140	4		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	119		108		30-150
Decachlorobiphenyl	120		111		30-150
2,4,5,6-Tetrachloro-m-xylene	111		99		30-150
Decachlorobiphenyl	111		100		30-150

INORGANICS
&
MISCELLANEOUS

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-02
Client ID: CMU-H-7
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:05
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-03
Client ID: CMU-H-8
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:10
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-04
Client ID: CMU-I-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:20
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-05
Client ID: CMU-I-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:25
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-06
Client ID: CMU-I-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:30
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-07
Client ID: CMU-I-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:35
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-08
Client ID: CMU-I-5
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:40
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-09
Client ID: CMU-I-6
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:45
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-10
Client ID: CMU-I-7
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:50
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-11
Client ID: CMU-I-8
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:55
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-12
Client ID: CRACK-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:25
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-13
Client ID: CMU-I-8_DUP
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 10:55
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-14
Client ID: CMU-J-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 11:00
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-15
Client ID: CMU-J-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 11:05
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-16
Client ID: CMU-J-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 11:10
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	98		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-17
Client ID: CMU-J-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 11:15
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-18
Client ID: CMU-J-5
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 11:20
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-19
Client ID: CMU-J-6
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 11:25
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-20
Client ID: CMU-J-7
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 11:30
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-21
Client ID: CMU-J-8
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 11:35
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/13/12 18:50	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-22
Client ID: CMU-J-8_DUP
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 11:35
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/17/12 00:05	30,2540G	RD

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

SAMPLE RESULTS

Lab ID: L1212504-24
Client ID: CRACK-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/13/12 12:15
Date Received: 07/13/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/17/12 00:05	30,2540G	RD

Lab Duplicate Analysis
Batch Quality Control

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 02-21 QC Batch ID: WG548359-1 QC Sample: L1212504-02 Client ID: CMU-H-7						
Solids, Total	100	100	%	0		20
General Chemistry - Westborough Lab Associated sample(s): 22,24 QC Batch ID: WG548767-1 QC Sample: L1212278-01 Client ID: DUP Sample						
Solids, Total	48	48	%	0		20

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal

Cooler	
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1212504-01A	Amber 1000ml unpreserved	A	7	4	Y	Absent	MCP-8082-10(365)
L1212504-01B	Amber 1000ml unpreserved	A	7	4	Y	Absent	MCP-8082-10(365)
L1212504-02A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-03A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-04A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-05A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-06A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-07A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-08A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-09A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-10A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-11A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-12A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-13A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-14A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-15A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-16A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-17A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-18A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)

*Values in parentheses indicate holding time in days

Project Name: MBTA/LECHMERE
Project Number: P2814

Lab Number: L1212504
Report Date: 07/20/12

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1212504-19A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-20A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-21A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-22A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212504-23A	Amber 1000ml unpreserved	A	7	4	Y	Absent	MCP-8082-10(365)
L1212504-23B	Amber 1000ml unpreserved	A	7	4	Y	Absent	MCP-8082-10(365)
L1212504-24A	Amber 120ml unpreserved	A	N/A	4	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)

*Values in parentheses indicate holding time in days

Project Name:	MBTA/LECHMERE	**Lab Number:**	L1212504
Project Number:	P2814	**Report Date:**	07/20/12

GLOSSARY

Acronyms

EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NI	- Not Ignitable.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit.
C	- Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
D	- Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
E	- Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
G	- The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.
H	- The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
I	- The RPD between the results for the two columns exceeds the method-specified criteria; however, the lower value has been reported due to obvious interference.
M	- Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
NJ	- Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

Report Format: Data Usability Report

Project Name:	MBTA/LECHMERE	**Lab Number:**	L1212504
Project Number:	P2814	**Report Date:**	07/20/12

Data Qualifiers

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name: MBTA/LECHMERE **Lab Number:** L1212504
Project Number: P2814 **Report Date:** 07/20/12

REFERENCES

30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certificate/Approval Program Summary

Last revised May 11, 2012 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. ***NELAP Accredited Solid Waste/Soil.***

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP) 504.1, Ethylene Dibromide (EDB) 504.1, 1,4-Dioxane (Mod 8270). Microbiology Parameters: Total Coliform-MF mEndo (SM9222B), Total Coliform – Colilert (SM9223 P/A), E. Coli. – Colilert (SM9223 P/A), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D, Fecal Coliform-EC Medium 9221E).

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, O-Phosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics, TPH (HEM/SGT), Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH. Microbiology Parameters: Total Coliform – MF mEndo (SM9222B), Total Coliform – MTF (SM9221B), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform – A-1 Broth (SM9221E), Enterolert, E.Coli 9223.

Solid Waste/Soil (Inorganic Parameters: pH, Sulfide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), SPLP Leach (1312 metals only), Reactivity. Organic Parameters: PCBs, PCBs in Oil, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH, Dicamba, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Dalapon, Volatile Organics, Acid Extractables (Phenols), Benzidines, Phthalates, Nitrosamines, Nitroaromatics & Cyclic Ketones, PAHs, Haloethers, Chlorinated Hydrocarbons.)

Maine Department of Human Services Certificate/Lab ID: 2009024.
Drinking Water (Inorganic Parameters: SM9215B, 9222D, 9223B, EPA 180.1, 353.2, SM2130B, 2320B, 2540C, 4500Cl-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H+B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1, EPA 300.0. Organic Parameters: 504.1, 524.2.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, SM2320B, 2510B, 2540C, 2540D, 426C, 4500Cl-D, 4500Cl-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NO3-F, 4500P-B, 4500P-E, 5210B, 5220D, 5310C, 9010B, 9040B, 9030B, 7470A, 7196A, 2340B, EPA 200.7, 6010B, 200.8, 6020, 245.1, 1311, 1312, 3005A, Enterolert, 9223D, 9222D. Organic Parameters: 608, 624, 625, 8081A, 8082, 8330, 8151A, 8260B, 8270C, 3510C, 3630C, 5030B, ME-DRO, ME-GRO, MA-EPH, MA-VPH.)

Solid Waste/Soil (Inorganic Parameters: 9010B, 9012A, 9014A, 9030B, 9040B, 9045C, 6010B, 7471A, 7196A, 9050A, 1010, 1030, 9065, 1311, 1312, 3005A, 3050B. Organic Parameters: ME-DRO, ME-GRO, MA-EPH, MA-VPH, 8260B, 8270C, 8330, 8151A, 8081A, 8082, 3540C, 3546, 3580A, 3630C, 5030B, 5035.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.
*Drinking Water (*Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl) (EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Fluoride, Sulfate); (EPA 353.2 for: Nitrate-N, Nitrite-N); (SM4500NO3-F for: Nitrate-N and Nitrite-N); 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, 2320B, SM2540C, SM4500H-B. Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics); (504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), EPA 332. Microbiology Parameters: SM9215B; ENZ. SUB. SM9223; ColilertQT SM9223B; MF-SM9222D.)

*Non-Potable Water (*Inorganic Parameters:, (EPA 200.8 for: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn); (EPA 200.7 for: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn); 245.1, SM4500H,B, EPA 120.1,

SM2510B, 2540C, 2340B, 2320B, 4500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia-N), LACHAT 10-107-06-1-B for Ammonia-N, SM4500NO3-F, 353.2 for Nitrate-N, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 5310C, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.
Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics),(608 for: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT,Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs-Water), (EPA 625 for SVOC Acid Extractables and SVOC Base/Neutral Extractables), 600/4-81-045-PCB-Oil. Microbiology Parameters: (ColilertQT SM9223B; Enterolert-QT: SM9222D-MF.)

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM 9222B, 9223B, 9215B, EPA 200.7, 200.8, 245.2, 300.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 332.0. Organic Parameters: 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 3005A, 200.7, 200.8, 245.1, 245.2, SW-846 6010B, 6010C, 6020, 6020A, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 350.2, 351.1, 353.2, 410.4, 420.1, 426C, 1664A, SW-846 9010B, 9030B, 9040B, SM426C, SM2120B, 2310B, 2320B, 2540B, 2540D, 4500H+B, 4500CL-E, 4500CN-E, 4500NH3-H, 4500NO3-F, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 5220D, 2510B, 2540C, 4500F-C, 5310C, 5540C, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D. Organic Parameters: SW-846 3510C, 3630C, 5030B, 8260B, 8270C, 8270D, 8330, EPA 624, 625, 608, SW-846 8082, 8081A, 8081B, 8151A.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 6010C, 7196A, 7471A, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040B, 9045C, 9050, 9065,1311, 1312, 3005A, 3050B, 3060A. Organic Parameters: SW-846 3540C, 3546, 3550B, 3580A, 3630C, 5030B, 5035, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330, 8151A, 8015B, 8082, 8082A, 8081A, 8081B.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9223B, 9215B, 4500CN-CE, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 200.8, 245.2, 2540C, SM2120B, 2320B, 2510B, 5310C, SM4500H-B. Organic Parameters: EPA 332, 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500Cl-E, EPA 300.0, SM2120B, 2340B, SM4500F-BC, EPA 200.7, 200.8, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM510ABC, SM4500P-B5+E, 2540B, 2540C, 2540D, 2540G, EPA 120.1, SM2510B, SM15 426C, 9222D, 9221B, 9221C, 9221E, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, 350.2, SW-846 1312, 7470A, 5540C, SM4500H-B, 4500SO3-B, SM3500Cr-D, 4500CN-CE, EPA 245.1, 245.2, SW-846 9040B, 3005A, 3015, EPA 6010B, 6010C, 6020, 6020A, 7196A, 3060A, SW-846 9010B, 9030B. Organic Parameters: SW-846 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3510C, EPA 608, 624, 625, SW-846 3630C, 5030B, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 1,4-Dioxane by NJ Modified 8270, 8015B, NJ OQA-QAM-025 Rev.7, NJ EPH.)

Solid & Chemical Materials (Inorganic Parameters: SW-846, 6010B, 6010C,6020, 6020A, 7196A, 3060A, 9010B, 9030B, 1010, 1030, 1311, 1312, 3005A, 3050B, 7471A, 7471B, 9014, 9012A, 9040B, 9045C, 9050A, 9065. Organic Parameters: SW-846 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3540C, 3546, 3580A, 3630C, 5030B, 5035L, 5035H, NJ OQA-QAM-025 Rev.7, NJ EPH.)

New York Department of Health Certificate/Lab ID: 11148. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9223B, 9222B, 9215B, EPA 200.8, 200.7, 245.2, SM5310C, EPA 332.0, SM2320B, EPA 300.0, SM2120B, 4500CN-E, 4500F-C, 4500NO3-F, 2540C, SM 2510B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222B, 9215B, 5210B, 5310C, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, SM4500CL-E, 4500F-C, SM15 426C, EPA 350.1, SM4500NH3-BH, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, SM4500-NO3-F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6010C, 6020, 6020A, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, LACHAT 10-204-00-1-A, 4500CN-CE, EPA 1664A, EPA 420.1, SM14 510C, EPA 120.1, SM2510B, SM4500S-D, SM5540C, EPA 3005A, 3015, 9010B, 9030B. Organic Parameters: EPA 624, 8260B, 8270C, 8270D, 625, 608, 8081A, 8081B, 8151A, 8330, 8082, 8082A, EPA 3510C, 5030B.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010, 1030, EPA 6010B, 6010C, 7196A, 7471A, 7471B, 9012A, 9014, 9065, 9050A, EPA 1311, 1312, 3005A, 3050B, 9010B, 9030B. Organic Parameters: EPA 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8015B, 8015C, 8081A, 8081B, 8151A, 8330, 8082 8082A, 3540C, 3546, 3580, 3580A, 5030B, 5035.)

North Carolina Department of the Environment and Natural Resources Certificate/Lab ID : 666. Organic Parameters: MA-EPH, MA-VPH.

Drinking Water Program Certificate/Lab ID: 25700. (Inorganic Parameters: Chloride EPA 300.0. Organic Parameters: 524.2)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. ***NELAP Accredited.***
Drinking Water (Organic Parameters: EPA 524.2, 504.1)

Non-Potable Water (Inorganic Parameters: EPA 1312, 3005A, 200.7, 410.4, 1664A, SM2540D, 5210B, 5220D, 4500-P,BE. Organic Parameters: EPA 3510C, 3630C, 5030B, 625, 624, 608, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330)

Solid & Hazardous Waste (Inorganic Parameters: EPA 350.1, 1010, 1030, 1311, 1312, 3050B, 3060A, 6010B, 6010C, 7196A, 7471A, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065, SM 4500NH3-H. Organic Parameters: 3540C, 3546, 3580A, 3630C, 5035, 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. ***NELAP Accredited via NY-DOH.***
Refer to MA-DEP Certificate for Potable and Non-Potable Water.
Refer to NJ-DEP Certificate for Potable and Non-Potable Water.

Texas Commisson on Environmental Quality Certificate/Lab ID: T104704476-09-1. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664, 200.7, 200.8, 245.1, 245.2, 300.0, 350.1, 351.1, 353.2, 410.4, 420.1, 6010, 6020, 7196, 7470, 9040, SM 2120B, 2310B, 2320B, 2510B, 2540B, 2540C, 2540D, 426C, 4500CL-E, 4500CN-E, 4500F-C, 4500H+B, 4500NH3-H, 4500NO2B, 4500P-E, 4500 S2¯D, 510C, 5210B, 5220D, 5310C, 5540C. Organic Parameters: EPA 608, 624, 625, 8081, 8082, 8151, 8260, 8270, 8330.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1311, 1312, 9012, 9014, 9040, 9045, 9050, 9065.)

Virginia Division of Consolidated Laboratory Services Certificate/Lab ID: 460195. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 3005A,3015,1312,6010B,6010C,SM4500S-D, SM4500-CN-CE, Lachat 10-204-00-1-X. Organic Parameters: EPA 8260B)

Solid & Hazardous Waste (Inorganic Parameters: EPA 3050B, 1311, 1312, 6010B, 6010C, 9030B, 9010B, 9012A, 9014. Organic Parameters: EPA 5035, 5030B, 8260B, 8015B, 8015C.)

Department of Defense, L-A-B Certificate/Lab ID: L2217.
Drinking Water (Inorganic Parameters: SM 4500H-B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: EPA 200.7, 200.8, 6010B, 6010C, 6020, 6020A, 245.1, 245.2, 7470A, 9040B, 9010B, 180.1. 300.0, 332.0, 6860, 353.2, 410.4, 9060, 1664A, SM 4500CN-E, 4500H-B, 4500NO3-F, 4500CL-D, 5220D, 5310C, 2130B, 2320B, 2540C, 3005A, 3015, 9010B, 9056. Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A, 8082, 8082A, 8081A, 8081B, 3510C, 5030B, MassDEP EPH, MassDEP VPH.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 200.7, 6010B, 6010C, 7471A, 6860, 1311, 1312, 3050B, 7196A, 9010B, 9012A, 9040B, 9045C, 3500-CR-D, 4500CN-CE, 2540G, Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A/B-prep, 8082, 8082A, 8081A, 8081B, 3540C, 3546, 3580A, 5035A, MassDEP EPH, MassDEP VPH.)

The following analytes are not included in our current NELAP/TNI Scope of Accreditation:
EPA 8260B: Freon-113, 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene. **EPA 8330A:** PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT. **EPA 8270C:** Methyl naphthalene, Dimethyl naphthalene, Total Methylnapthalenes, Total Dimethylnaphthalenes, 1,4-Diphenylhydrazine (Azobenzene). **EPA 625:** 4-Chloroaniline, 4-Methylphenol. Total Phosphorus in a soil matrix, Chloride in a soil matrix, TKN in a soil matrix, NO2 in a soil matrix, NO3 in a soil matrix, SO4 in a soil matrix. **EPA 9071:** Total Petroleum Hydrocarbons, Oil & Grease

CHAIN OF CUSTODY

PAGE 3 OF 5

Date Rec'd in Lab: 7/13/12

ALPHA Job #: L1212504

ALPHA ANALYTICAL — World Class Chemistry
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: Naver-Armstrong Assoc.
Address: 124 Main St, Unit 2G
Carver MA 02330
Phone: 508-866-8383
Email: malger@noverarmstrong.com

Project Information

Project Name: MBTA/Lechmere
Project Location: ~~P281~~ Cambridge
Project #: P2814
Project Manager: Matt Alger
ALPHA Quote #:

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Report Information - Data Deliverables

☑ ADEx ☑ EMAIL

Billing Information

☑ Same as Client info PO #: P2814

Regulatory Requirements & Project Information Requirements

☑ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☑ No CT RCP Analytical Methods
☐ Yes ☑ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☑ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☑ No NPDES RGP
☐ Other State /Fed Program TSCA Criteria

Additional Project Information:

Use Soxhlet Extraction

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☑ PCB ☐ PEST Soxhlet; TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO — Filtration: ☐ Field ☐ Lab to do; Preservation: ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	PCB	Sample Comments	TOTAL # BOTTLES
12501 01	EQUIP BLANK-4	7/13/12	9:20 am	DI water	MA	2		2
02	CMU-H-7		10:05 am	Concrete Powder		1		1
03	CMU-H-8		10:10 am			1		1
04	CMU-I-1		10:20 am			1		1
05	CMU-I-2		10:25 am			1		1
06	CMU-I-3		10:30 am			1		1
07	CMU-I-4		10:35 am			1		1
08	CMU-I-5		10:40 am			1		1
09	CMU-I-6		10:45 am			1		1
10	CMU-I-7		10:50 am			1		1
				Container Type		A		
				Preservative		A		

Container Type: P= Plastic; A= Amber glass; V= Vial; G= Glass; B= Bacteria cup; C= Cube; O= Other; E= Encore; D= BOD Bottle

Preservative: A= None; B= HCl; C= HNO_3; D= H_2SO_4; E= NaOH; F= MeOH; G= $NaHSO_4$; H = $Na_2S_2O_3$; I= Ascorbic Acid; J = NH_4Cl; K= Zn Acetate; O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7/13/12 15:20	[signature]	7/13/12 1520

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FORM NO. 01-01 (rev. 12-Mar-2012)

CHAIN OF CUSTODY

PAGE 4 OF 5

Date Rec'd in Lab: 7/13/12

ALPHA Job #: L1212504

ALPHA ANALYTICAL
World Class Chemistry
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Project Information

Project Name: MBTA/Lechmere
Project Location: Cambridge
Project #: P2814
Project Manager: Matt Alger
ALPHA Quote #:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #: P2814

Client Information

Client: Nover-Armstrong Assoc.
Address: 124 Main St, Unit 2GG, Carver, MA 02330
Phone: 508-866-8383
Email: malger@noverarmstrong.com

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods
☒ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☒ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program TSCA Criteria

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due:

Additional Project Information:

Use Soxhlet Extraction

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☒ PCB ☐ PEST Soxhlet; TPH: ☐ Quant Only ☐ Fingerprint

SAMPLE INFO: Filtration ☐ Field ☐ Lab to do; Preservation ☐ Lab to do

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	PCB	Sample Comments	Total # Bottles
12504-11	CMU-I-8	7/13/12	10:55	Concrete powder	MA	1		1
-12	CRACK-3		10:25am			1		1
-13	CMU-I-8_DUP		10:55			1		1
-14	CMU-J-1		11:00			1		1
-15	CMU-J-2		11:05			1		1
-16	CMU-J-3		11:10			1		1
-17	CMU-J-4		11:15			1		1
-18	CMU-J-5		11:20			1		1
-19	CMU-J-6		11:25			1		1
-20	CMU-J-7		11:30			1		1
					Container Type	A		
					Preservative	A		

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
[illegible]	7/13/12 15:20	[illegible]	7/13/12 15:20

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FORM NO: 01-01 (rev. 12-Mar-2012)

CHAIN OF CUSTODY

PAGE 5 OF 5

Date Rec'd in Lab: 7/13/12

ALPHA Job #: L1212504

ALPHA Analytical — World Class Chemistry
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: Nover-Armstrong Assoc.
Address: 124 Main St, Unit 26A, Carver, MA 02330
Phone: 508-866-8383
Email: malger@noveramcmp.com

Project Information

Project Name: MBTA / Lechmere
Project Location: Cambridge
Project #: P2814
Project Manager: Matt Alger
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☒ Same as Client info PO #: P2814

Regulatory Requirements & Project Information Requirements

☒ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☒ No CT RCP Analytical Methods
☐ Yes ☒ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☒ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☒ No NPDES RGP
☐ Other State /Fed Program TSCA Criteria

Additional Project Information:

Use Soxhlet Extraction

ANALYSIS: VOC: ☐ 8260 ☐ 624 ☐ 524.2; SVOC: ☐ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15; METALS: ☐ RCRA5 ☐ RCRA8 ☐ PP13; EPH: ☐ Ranges & Targets ☐ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☒ PCB ☐ PEST; TPH: ☐ Quant Only ☐ Fingerprint

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	PCB	Sample Comments	TOTAL # BOTTLES
12504-21	CMU-J-8	7/13/12	11:35am	Concrete powder	MA	1		1
-22	CMU-J-8_DUP		11:35am	Concrete powder		1		1
-23	EQUIP BLANK-5		12:00pm	DI water		2		2
-24	CRACK-4		12:15pm	Concrete powder		1		1
	Container Type					A		
	Preservative					A		

Container Type: P= Plastic, A= Amber glass, V= Vial, G= Glass, B= Bacteria cup, C= Cube, O= Other, E= Encore, D= BOD Bottle

Preservative: A= None, B= HCl, C= HNO_3, D= H_2SO_4, E= NaOH, F= MeOH, G= $NaHSO_4$, H = $Na_2S_2O_3$, I= Ascorbic Acid, J = NH_4Cl, K= Zn Acetate, O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
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All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

ANALYTICAL REPORT

Lab Number:	L1212650
Client:	Nover-Armstrong Associates 124 Main Street Unit 2GG Carver, MA 02330
ATTN:	Matt Alger
Phone:	(508) 866-8383
Project Name:	21 WATER ST.
Project Number:	P2814
Report Date:	07/25/12

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), USDA (Permit #P-330-11-00240), NC (666), TX (T104704476), DOD (L2217), US Army Corps of Engineers.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L1212650-01	EQUIPMENT BLANK	CAMBRIDGE	07/17/12 07:40
L1212650-02	FLOOR-2-1 (CAULK)	CAMBRIDGE	07/17/12 07:40
L1212650-03	FLOOR-2-2 (CAULK)	CAMBRIDGE	07/17/12 07:40
L1212650-04	FLOOR 2-3	CAMBRIDGE	07/17/12 07:50
L1212650-05	FLOOR 2-4	CAMBRIDGE	07/17/12 08:00
L1212650-06	WALL-4-1	CAMBRIDGE	07/17/12 08:20
L1212650-07	WALL-4-2	CAMBRIDGE	07/17/12 08:30
L1212650-08	WALL-4-3	CAMBRIDGE	07/17/12 08:40
L1212650-09	WALL-4-4	CAMBRIDGE	07/17/12 08:50
L1212650-10	WALL-4-4 (DUP)	CAMBRIDGE	07/17/12 08:50
L1212650-11	WALL-1-1	CAMBRIDGE	07/17/12 09:10
L1212650-12	WALL-1-2	CAMBRIDGE	07/17/12 09:20
L1212650-13	WALL-1-3	CAMBRIDGE	07/17/12 09:30
L1212650-14	WALL-1-4	CAMBRIDGE	07/17/12 09:40
L1212650-15	WALL-3-1 (CAULK)	CAMBRIDGE	07/17/12 10:00
L1212650-16	WALL-3-2 (CAULK)	CAMBRIDGE	07/17/12 10:10
L1212650-17	WALL-3-3	CAMBRIDGE	07/17/12 10:20
L1212650-18	WALL-3-4	CAMBRIDGE	07/17/12 10:30

Project Name: 21 WATER ST. **Lab Number:** L1212650

Project Number: P2814 **Report Date:** 07/25/12

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

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

A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	YES

For any questions answered "No", please refer to the case narrative section on the following page(s).

Please note that sample matrix information is located in the Sample Results section of this report.

Project Name: 21 WATER ST. **Lab Number:** L1212650
Project Number: P2814 **Report Date:** 07/25/12

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. Performance criteria for CAM and RCP methods allow for some LCS compound failures to occur and still be within method compliance. In these instances, the specific failures are not narrated but are noted in the associated QC table. This information is also incorporated in the Data Usability format for our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples free of charge for 30 days from the date the project is completed. After 30 days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: 21 WATER ST. **Lab Number:** L1212650
Project Number: P2814 **Report Date:** 07/25/12

Case Narrative (continued)

MCP Related Narratives

PCBs

L1212650-13 has elevated detection limits due to the dilution required by matrix interferences encountered during the concentration of the sample.

In reference to question G:

L1212650-13, -15, and -16: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

The surrogate recoveries for L1212650-15 and -16 are below the acceptance criteria for 2,4,5,6-Tetrachloro-m-xylene and Decachlorobiphenyl (all 0%) due to the dilutions required to quantitate the samples. Re-extractions were not required; therefore, the results of the original analyses are reported.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly Stenstrom

Title: Technical Director/Representative Date: 07/25/12

ORGANICS

PCBS

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-01	Date Collected:	07/17/12 07:40
Client ID:	EQUIPMENT BLANK	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	97,8082	Extraction Date:	07/19/12 08:23
Analytical Date:	07/22/12 20:44	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/19/12
		Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/19/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/l	0.250	--	1
Aroclor 1221	ND		ug/l	0.250	--	1
Aroclor 1232	ND		ug/l	0.250	--	1
Aroclor 1242	ND		ug/l	0.250	--	1
Aroclor 1248	ND		ug/l	0.250	--	1
Aroclor 1254	ND		ug/l	0.250	--	1
Aroclor 1260	ND		ug/l	0.250	--	1
Aroclor 1262	ND		ug/l	0.250	--	1
Aroclor 1268	ND		ug/l	0.250	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	91		30-150
Decachlorobiphenyl	79		30-150
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	73		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-02	Date Collected:	07/17/12 07:40
Client ID:	FLOOR-2-1 (CAULK)	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 04:47	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.5	--	1
Aroclor 1221	ND		ug/kg	58.5	--	1
Aroclor 1232	ND		ug/kg	58.5	--	1
Aroclor 1242	ND		ug/kg	58.5	--	1
Aroclor 1248	ND		ug/kg	39.0	--	1
Aroclor 1254	ND		ug/kg	58.5	--	1
Aroclor 1262	ND		ug/kg	19.5	--	1
Aroclor 1268	ND		ug/kg	19.5	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	80		30-150
Decachlorobiphenyl	69		30-150
2,4,5,6-Tetrachloro-m-xylene	81		30-150
Decachlorobiphenyl	73		30-150

Project Name: 21 WATER ST. **Lab Number:** L1212650

Project Number: P2814 **Report Date:** 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-02	Date Collected:	07/17/12 07:40
Client ID:	FLOOR-2-1 (CAULK)	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 04:47	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	1520		ug/kg	39.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	80		30-150
Decachlorobiphenyl	69		30-150
2,4,5,6-Tetrachloro-m-xylene	81		30-150
Decachlorobiphenyl	73		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-03	Date Collected:	07/17/12 07:40
Client ID:	FLOOR-2-2 (CAULK)	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 05:00	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.9	--	1
Aroclor 1221	ND		ug/kg	57.9	--	1
Aroclor 1232	ND		ug/kg	57.9	--	1
Aroclor 1242	ND		ug/kg	57.9	--	1
Aroclor 1248	ND		ug/kg	38.6	--	1
Aroclor 1254	ND		ug/kg	57.9	--	1
Aroclor 1260	651		ug/kg	38.6	--	1
Aroclor 1262	ND		ug/kg	19.3	--	1
Aroclor 1268	ND		ug/kg	19.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	66		30-150
Decachlorobiphenyl	61		30-150
2,4,5,6-Tetrachloro-m-xylene	64		30-150
Decachlorobiphenyl	60		30-150

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-04	Date Collected:	07/17/12 07:50
Client ID:	FLOOR 2-3	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 05:13	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	98%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	52.2	--	1
Aroclor 1221	ND		ug/kg	52.2	--	1
Aroclor 1232	ND		ug/kg	52.2	--	1
Aroclor 1242	ND		ug/kg	52.2	--	1
Aroclor 1248	ND		ug/kg	34.8	--	1
Aroclor 1254	ND		ug/kg	52.2	--	1
Aroclor 1260	114		ug/kg	34.8	--	1
Aroclor 1262	ND		ug/kg	17.4	--	1
Aroclor 1268	ND		ug/kg	17.4	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	76		30-150
Decachlorobiphenyl	66		30-150
2,4,5,6-Tetrachloro-m-xylene	75		30-150
Decachlorobiphenyl	66		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-05	Date Collected:	07/17/12 08:00
Client ID:	FLOOR 2-4	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/24/12 11:13
Analytical Date:	07/25/12 12:34	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/25/12
Percent Solids:	98%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/25/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	54.8	--	1
Aroclor 1221	ND		ug/kg	54.8	--	1
Aroclor 1232	ND		ug/kg	54.8	--	1
Aroclor 1242	ND		ug/kg	54.8	--	1
Aroclor 1248	ND		ug/kg	36.5	--	1
Aroclor 1254	ND		ug/kg	54.8	--	1
Aroclor 1260	336		ug/kg	36.5	--	1
Aroclor 1262	ND		ug/kg	18.2	--	1
Aroclor 1268	ND		ug/kg	18.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	67		30-150
Decachlorobiphenyl	58		30-150
2,4,5,6-Tetrachloro-m-xylene	61		30-150
Decachlorobiphenyl	57		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-06	Date Collected:	07/17/12 08:20
Client ID:	WALL-4-1	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 05:40	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	52.7	--	1
Aroclor 1221	ND		ug/kg	52.7	--	1
Aroclor 1232	ND		ug/kg	52.7	--	1
Aroclor 1242	ND		ug/kg	52.7	--	1
Aroclor 1248	ND		ug/kg	35.1	--	1
Aroclor 1254	ND		ug/kg	52.7	--	1
Aroclor 1260	ND		ug/kg	35.1	--	1
Aroclor 1262	ND		ug/kg	17.6	--	1
Aroclor 1268	ND		ug/kg	17.6	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	84		30-150
Decachlorobiphenyl	78		30-150
2,4,5,6-Tetrachloro-m-xylene	83		30-150
Decachlorobiphenyl	77		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-07	Date Collected:	07/17/12 08:30
Client ID:	WALL-4-2	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 05:53	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	51.6	--	1
Aroclor 1221	ND		ug/kg	51.6	--	1
Aroclor 1232	ND		ug/kg	51.6	--	1
Aroclor 1242	ND		ug/kg	51.6	--	1
Aroclor 1248	ND		ug/kg	34.4	--	1
Aroclor 1254	ND		ug/kg	51.6	--	1
Aroclor 1260	ND		ug/kg	34.4	--	1
Aroclor 1262	ND		ug/kg	17.2	--	1
Aroclor 1268	ND		ug/kg	17.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	80		30-150
Decachlorobiphenyl	75		30-150
2,4,5,6-Tetrachloro-m-xylene	79		30-150
Decachlorobiphenyl	74		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-08	Date Collected:	07/17/12 08:40
Client ID:	WALL-4-3	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 06:06	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	51.0	--	1
Aroclor 1221	ND		ug/kg	51.0	--	1
Aroclor 1232	ND		ug/kg	51.0	--	1
Aroclor 1242	ND		ug/kg	51.0	--	1
Aroclor 1248	ND		ug/kg	34.0	--	1
Aroclor 1254	ND		ug/kg	51.0	--	1
Aroclor 1260	ND		ug/kg	34.0	--	1
Aroclor 1262	ND		ug/kg	17.0	--	1
Aroclor 1268	ND		ug/kg	17.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	96		30-150
Decachlorobiphenyl	96		30-150
2,4,5,6-Tetrachloro-m-xylene	94		30-150
Decachlorobiphenyl	95		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-09	Date Collected:	07/17/12 08:50
Client ID:	WALL-4-4	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 06:19	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	53.4	--	1
Aroclor 1221	ND		ug/kg	53.4	--	1
Aroclor 1232	ND		ug/kg	53.4	--	1
Aroclor 1242	ND		ug/kg	53.4	--	1
Aroclor 1248	ND		ug/kg	35.6	--	1
Aroclor 1254	ND		ug/kg	53.4	--	1
Aroclor 1260	55.8		ug/kg	35.6	--	1
Aroclor 1262	ND		ug/kg	17.8	--	1
Aroclor 1268	ND		ug/kg	17.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	84		30-150
Decachlorobiphenyl	80		30-150
2,4,5,6-Tetrachloro-m-xylene	82		30-150
Decachlorobiphenyl	79		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-10	Date Collected:	07/17/12 08:50
Client ID:	WALL-4-4 (DUP)	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 06:32	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	53.5	--	1
Aroclor 1221	ND		ug/kg	53.5	--	1
Aroclor 1232	ND		ug/kg	53.5	--	1
Aroclor 1242	ND		ug/kg	53.5	--	1
Aroclor 1248	ND		ug/kg	35.6	--	1
Aroclor 1254	ND		ug/kg	53.5	--	1
Aroclor 1260	ND		ug/kg	35.6	--	1
Aroclor 1262	ND		ug/kg	17.8	--	1
Aroclor 1268	ND		ug/kg	17.8	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	96		30-150
Decachlorobiphenyl	91		30-150
2,4,5,6-Tetrachloro-m-xylene	94		30-150
Decachlorobiphenyl	90		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-11	Date Collected:	07/17/12 09:10
Client ID:	WALL-1-1	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 06:45	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	55.0	--	1
Aroclor 1221	ND		ug/kg	55.0	--	1
Aroclor 1232	ND		ug/kg	55.0	--	1
Aroclor 1242	ND		ug/kg	55.0	--	1
Aroclor 1248	ND		ug/kg	36.7	--	1
Aroclor 1254	ND		ug/kg	55.0	--	1
Aroclor 1260	142		ug/kg	36.7	--	1
Aroclor 1262	ND		ug/kg	18.3	--	1
Aroclor 1268	ND		ug/kg	18.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	93		30-150
Decachlorobiphenyl	94		30-150
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	92		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-12	Date Collected:	07/17/12 09:20
Client ID:	WALL-1-2	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 06:58	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	51.6	--	1
Aroclor 1221	ND		ug/kg	51.6	--	1
Aroclor 1232	ND		ug/kg	51.6	--	1
Aroclor 1242	ND		ug/kg	51.6	--	1
Aroclor 1248	ND		ug/kg	34.4	--	1
Aroclor 1254	ND		ug/kg	51.6	--	1
Aroclor 1260	170		ug/kg	34.4	--	1
Aroclor 1262	ND		ug/kg	17.2	--	1
Aroclor 1268	ND		ug/kg	17.2	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	108		30-150
Decachlorobiphenyl	106		30-150
2,4,5,6-Tetrachloro-m-xylene	105		30-150
Decachlorobiphenyl	105		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-13	Date Collected:	07/17/12 09:30
Client ID:	WALL-1-3	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 07:11	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	113	--	2
Aroclor 1221	ND		ug/kg	113	--	2
Aroclor 1232	ND		ug/kg	113	--	2
Aroclor 1242	ND		ug/kg	113	--	2
Aroclor 1248	ND		ug/kg	75.3	--	2
Aroclor 1254	ND		ug/kg	113	--	2
Aroclor 1260	264		ug/kg	75.3	--	2
Aroclor 1262	ND		ug/kg	37.7	--	2
Aroclor 1268	ND		ug/kg	37.7	--	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	85		30-150
2,4,5,6-Tetrachloro-m-xylene	86		30-150
Decachlorobiphenyl	82		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-14	Date Collected:	07/17/12 09:40
Client ID:	WALL-1-4	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 07:25	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.0	--	1
Aroclor 1221	ND		ug/kg	58.0	--	1
Aroclor 1232	ND		ug/kg	58.0	--	1
Aroclor 1242	ND		ug/kg	58.0	--	1
Aroclor 1248	ND		ug/kg	38.7	--	1
Aroclor 1254	ND		ug/kg	58.0	--	1
Aroclor 1260	140		ug/kg	38.7	--	1
Aroclor 1262	ND		ug/kg	19.3	--	1
Aroclor 1268	ND		ug/kg	19.3	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	81		30-150
Decachlorobiphenyl	84		30-150
2,4,5,6-Tetrachloro-m-xylene	79		30-150
Decachlorobiphenyl	84		30-150

Project Name: 21 WATER ST. **Lab Number:** L1212650

Project Number: P2814 **Report Date:** 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-15 D	Date Collected:	07/17/12 10:00
Client ID:	WALL-3-1 (CAULK)	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3580A
Analytical Method:	97,8082	Extraction Date:	07/18/12 07:37
Analytical Date:	07/24/12 11:26	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	1030000	--	400
Aroclor 1221	ND		ug/kg	1030000	--	400
Aroclor 1232	ND		ug/kg	1030000	--	400
Aroclor 1242	ND		ug/kg	1030000	--	400
Aroclor 1248	ND		ug/kg	690000	--	400
Aroclor 1254	ND		ug/kg	1030000	--	400
Aroclor 1262	ND		ug/kg	345000	--	400
Aroclor 1268	ND		ug/kg	345000	--	400

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: 21 WATER ST. **Lab Number:** L1212650

Project Number: P2814 **Report Date:** 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-15 D	Date Collected:	07/17/12 10:00
Client ID:	WALL-3-1 (CAULK)	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3580A
Analytical Method:	97,8082	Extraction Date:	07/18/12 07:37
Analytical Date:	07/24/12 11:26	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	18400000		ug/kg	690000	--	400

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: 21 WATER ST. **Lab Number:** L1212650

Project Number: P2814 **Report Date:** 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-16 D	Date Collected:	07/17/12 10:10
Client ID:	WALL-3-2 (CAULK)	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3580A
Analytical Method:	97,8082	Extraction Date:	07/18/12 07:37
Analytical Date:	07/24/12 11:39	Cleanup Method1:	EPA 3665A
Analyst:	KB	Cleanup Date1:	07/18/12
Percent Solids:	Results reported on an 'AS RECEIVED' basis.	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/18/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	1040000	--	400
Aroclor 1221	ND		ug/kg	1040000	--	400
Aroclor 1232	ND		ug/kg	1040000	--	400
Aroclor 1242	ND		ug/kg	1040000	--	400
Aroclor 1248	ND		ug/kg	696000	--	400
Aroclor 1254	ND		ug/kg	1040000	--	400
Aroclor 1260	22500000		ug/kg	696000	--	400
Aroclor 1262	ND		ug/kg	348000	--	400
Aroclor 1268	ND		ug/kg	348000	--	400

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150
2,4,5,6-Tetrachloro-m-xylene	**0**	Q	30-150
Decachlorobiphenyl	**0**	Q	30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-17	Date Collected:	07/17/12 10:20
Client ID:	WALL-3-3	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/22/12 15:33
Analytical Date:	07/24/12 07:38	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/23/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/23/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	57.2	--	1
Aroclor 1221	ND		ug/kg	57.2	--	1
Aroclor 1232	ND		ug/kg	57.2	--	1
Aroclor 1242	ND		ug/kg	57.2	--	1
Aroclor 1248	ND		ug/kg	38.2	--	1
Aroclor 1254	ND		ug/kg	57.2	--	1
Aroclor 1260	491		ug/kg	38.2	--	1
Aroclor 1262	ND		ug/kg	19.1	--	1
Aroclor 1268	ND		ug/kg	19.1	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	92		30-150
Decachlorobiphenyl	92		30-150
2,4,5,6-Tetrachloro-m-xylene	90		30-150
Decachlorobiphenyl	90		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-18	Date Collected:	07/17/12 10:30
Client ID:	WALL-3-4	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/24/12 11:13
Analytical Date:	07/25/12 12:47	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/25/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/25/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1016	ND		ug/kg	58.6	--	1
Aroclor 1221	ND		ug/kg	58.6	--	1
Aroclor 1232	ND		ug/kg	58.6	--	1
Aroclor 1242	ND		ug/kg	58.6	--	1
Aroclor 1248	ND		ug/kg	39.1	--	1
Aroclor 1254	922		ug/kg	58.6	--	1
Aroclor 1262	ND		ug/kg	19.5	--	1
Aroclor 1268	ND		ug/kg	19.5	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	78		30-150
Decachlorobiphenyl	70		30-150
2,4,5,6-Tetrachloro-m-xylene	75		30-150
Decachlorobiphenyl	67		30-150

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID:	L1212650-18	Date Collected:	07/17/12 10:30
Client ID:	WALL-3-4	Date Received:	07/17/12
Sample Location:	CAMBRIDGE	Field Prep:	Not Specified
Matrix:	Solid	Extraction Method:	EPA 3540C
Analytical Method:	97,8082	Extraction Date:	07/24/12 11:13
Analytical Date:	07/25/12 12:47	Cleanup Method1:	EPA 3665A
Analyst:	BA	Cleanup Date1:	07/25/12
Percent Solids:	100%	Cleanup Method2:	EPA 3660B
		Cleanup Date2:	07/25/12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Polychlorinated Biphenyls - Westborough Lab						
Aroclor 1260	854		ug/kg	39.1	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	78		30-150
Decachlorobiphenyl	70		30-150
2,4,5,6-Tetrachloro-m-xylene	75		30-150
Decachlorobiphenyl	67		30-150

Project Name: 21 WATER ST.

Project Number: P2814

Lab Number: L1212650

Report Date: 07/25/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/18/12 16:29
Analyst: KB

Extraction Method: EPA 3580A
Extraction Date: 07/18/12 07:36
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/18/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/18/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 15-16 Batch: WG549108-1					
Aroclor 1016	ND		ug/kg	2650	--
Aroclor 1221	ND		ug/kg	2650	--
Aroclor 1232	ND		ug/kg	2650	--
Aroclor 1242	ND		ug/kg	2650	--
Aroclor 1248	ND		ug/kg	1770	--
Aroclor 1254	ND		ug/kg	2650	--
Aroclor 1260	ND		ug/kg	1770	--
Aroclor 1262	ND		ug/kg	885	--
Aroclor 1268	ND		ug/kg	885	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	120		30-150
Decachlorobiphenyl	113		30-150
2,4,5,6-Tetrachloro-m-xylene	112		30-150
Decachlorobiphenyl	109		30-150

Project Name: 21 WATER ST.

Project Number: P2814

Lab Number: L1212650

Report Date: 07/25/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/22/12 20:07
Analyst: BA

Extraction Method: EPA 3510C
Extraction Date: 07/19/12 08:23
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/19/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/19/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG549417-1					
Aroclor 1016	ND		ug/l	0.250	--
Aroclor 1221	ND		ug/l	0.250	--
Aroclor 1232	ND		ug/l	0.250	--
Aroclor 1242	ND		ug/l	0.250	--
Aroclor 1248	ND		ug/l	0.250	--
Aroclor 1254	ND		ug/l	0.250	--
Aroclor 1260	ND		ug/l	0.250	--
Aroclor 1262	ND		ug/l	0.250	--
Aroclor 1268	ND		ug/l	0.250	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	96		30-150
Decachlorobiphenyl	89		30-150
2,4,5,6-Tetrachloro-m-xylene	83		30-150
Decachlorobiphenyl	74		30-150

Project Name: 21 WATER ST.

Project Number: P2814

Lab Number: L1212650

Report Date: 07/25/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/24/12 04:08
Analyst: BA

Extraction Method: EPA 3540C
Extraction Date: 07/22/12 15:33
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/23/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/23/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 02-04,06-14,17 Batch: WG550067-1					
Aroclor 1016	ND		ug/kg	52.8	--
Aroclor 1221	ND		ug/kg	52.8	--
Aroclor 1232	ND		ug/kg	52.8	--
Aroclor 1242	ND		ug/kg	52.8	--
Aroclor 1248	ND		ug/kg	35.2	--
Aroclor 1254	ND		ug/kg	52.8	--
Aroclor 1260	ND		ug/kg	35.2	--
Aroclor 1262	ND		ug/kg	17.6	--
Aroclor 1268	ND		ug/kg	17.6	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	95		30-150
Decachlorobiphenyl	98		30-150
2,4,5,6-Tetrachloro-m-xylene	93		30-150
Decachlorobiphenyl	95		30-150

Project Name: 21 WATER ST.

Project Number: P2814

Lab Number: L1212650

Report Date: 07/25/12

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 07/25/12 13:00
Analyst: BA

Extraction Method: EPA 3540C
Extraction Date: 07/24/12 11:13
Cleanup Method1: EPA 3665A
Cleanup Date1: 07/25/12
Cleanup Method2: EPA 3660B
Cleanup Date2: 07/25/12

Parameter	Result	Qualifier	Units	RL	MDL
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 05,18 Batch: WG550450-1					
Aroclor 1016	ND		ug/kg	57.2	--
Aroclor 1221	ND		ug/kg	57.2	--
Aroclor 1232	ND		ug/kg	57.2	--
Aroclor 1242	ND		ug/kg	57.2	--
Aroclor 1248	ND		ug/kg	38.2	--
Aroclor 1254	ND		ug/kg	57.2	--
Aroclor 1260	ND		ug/kg	38.2	--
Aroclor 1262	ND		ug/kg	19.1	--
Aroclor 1268	ND		ug/kg	19.1	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	85		30-150
Decachlorobiphenyl	77		30-150
2,4,5,6-Tetrachloro-m-xylene	84		30-150
Decachlorobiphenyl	76		30-150

Lab Control Sample Analysis
Batch Quality Control

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 15-16 Batch: WG549108-2 WG549108-3								
Aroclor 1016	126		115		40-140	9		30
Aroclor 1260	108		98		40-140	10		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	126		114		30-150
Decachlorobiphenyl	116		105		30-150
2,4,5,6-Tetrachloro-m-xylene	117		105		30-150
Decachlorobiphenyl	113		101		30-150

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG549417-2 WG549417-3								
Aroclor 1016	92		92		40-140	1		20
Aroclor 1260	85		84		40-140	1		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	97		94		30-150
Decachlorobiphenyl	95		92		30-150
2,4,5,6-Tetrachloro-m-xylene	86		84		30-150
Decachlorobiphenyl	78		75		30-150

Lab Control Sample Analysis
Batch Quality Control

Project Name: 21 WATER ST.
Project Number: P2814
Lab Number: L1212650
Report Date: 07/25/12

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 02-04,06-14,17 Batch: WG550067-2 WG550067-3								
Aroclor 1016	89		80		40-140	11		30
Aroclor 1260	82		74		40-140	10		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	100		91		30-150
Decachlorobiphenyl	95		88		30-150
2,4,5,6-Tetrachloro-m-xylene	96		87		30-150
Decachlorobiphenyl	94		85		30-150

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 05,18 Batch: WG550450-2 WG550450-3								
Aroclor 1016	77		94		40-140	20		30
Aroclor 1260	65		74		40-140	13		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,4,5,6-Tetrachloro-m-xylene	83		94		30-150
Decachlorobiphenyl	77		86		30-150
2,4,5,6-Tetrachloro-m-xylene	81		92		30-150
Decachlorobiphenyl	76		85		30-150

INORGANICS
&
MISCELLANEOUS

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-04
Client ID: FLOOR 2-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 07:50
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	98		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-05
Client ID: FLOOR 2-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 08:00
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	98		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-06
Client ID: WALL-4-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 08:20
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-07
Client ID: WALL-4-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 08:30
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-08
Client ID: WALL-4-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 08:40
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-09
Client ID: WALL-4-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 08:50
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-10
Client ID: WALL-4-4 (DUP)
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 08:50
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-11
Client ID: WALL-1-1
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 09:10
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-12
Client ID: WALL-1-2
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 09:20
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-13
Client ID: WALL-1-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 09:30
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-14
Client ID: WALL-1-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 09:40
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-17
Client ID: WALL-3-3
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 10:20
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

SAMPLE RESULTS

Lab ID: L1212650-18
Client ID: WALL-3-4
Sample Location: CAMBRIDGE
Matrix: Solid

Date Collected: 07/17/12 10:30
Date Received: 07/17/12
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	100		%	0.10	NA	1	-	07/18/12 00:30	30,2540G	RD

Lab Duplicate Analysis
Batch Quality Control

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 04-14,17-18 QC Batch ID: WG549064-1 QC Sample: L1212650-04 Client ID: FLOOR 2-3						
Solids, Total	98	98	%	0		20

Project Name: 21 WATER ST.
Project Number: P2814

Lab Number: L1212650
Report Date: 07/25/12

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Custody Seal

Cooler	
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1212650-01A	Amber 1000ml unpreserved	A	7	5	Y	Absent	MCP-8082-10(365)
L1212650-01B	Amber 1000ml unpreserved	A	7	5	Y	Absent	MCP-8082-10(365)
L1212650-02A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	MCP-8082LL-10-3540C(365)
L1212650-03A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS100(),MCP-8082LL-10-3540C(365)
L1212650-04A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-05A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-06A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-07A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-08A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-09A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-10A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-11A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-12A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-13A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-14A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-15A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS100(),MCP-8082LL-10-3540C(365)
L1212650-16A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS100(),MCP-8082LL-10-3540C(365)
L1212650-17A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)
L1212650-18A	Amber 120ml unpreserved	A	N/A	5	Y	Absent	TS(7),MCP-8082LL-10-3540C(365)

*Values in parentheses indicate holding time in days

Project Name:	21 WATER ST.	**Lab Number:**	L1212650
Project Number:	P2814	**Report Date:**	07/25/12

GLOSSARY

Acronyms

EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NI	- Not Ignitable.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit.
C	- Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
D	- Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
E	- Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
G	- The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.
H	- The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
I	- The RPD between the results for the two columns exceeds the method-specified criteria; however, the lower value has been reported due to obvious interference.
M	- Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
NJ	- Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

Report Format: Data Usability Report

Project Name: 21 WATER ST. **Lab Number:** L1212650

Project Number: P2814 **Report Date:** 07/25/12

Data Qualifiers

P - The RPD between the results for the two columns exceeds the method-specified criteria.

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

Project Name: 21 WATER ST. **Lab Number:** L1212650
Project Number: P2814 **Report Date:** 07/25/12

REFERENCES

30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certificate/Approval Program Summary

Last revised May 11, 2012 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. ***NELAP Accredited Solid Waste/Soil.***

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP) 504.1, Ethylene Dibromide (EDB) 504.1, 1,4-Dioxane (Mod 8270). Microbiology Parameters: Total Coliform-MF mEndo (SM9222B), Total Coliform – Colilert (SM9223 P/A), E. Coli. – Colilert (SM9223 P/A), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D, Fecal Coliform-EC Medium 9221E).

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, O-Phosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics, TPH (HEM/SGT), Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH. Microbiology Parameters: Total Coliform – MF mEndo (SM9222B), Total Coliform – MTF (SM9221B), HPC – Pour Plate (SM9215B), Fecal Coliform – MF m-FC (SM9222D), Fecal Coliform – A-1 Broth (SM9221E), Enterolert, E.Coli 9223.

Solid Waste/Soil (Inorganic Parameters: pH, Sulfide, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), SPLP Leach (1312 metals only), Reactivity. Organic Parameters: PCBs, PCBs in Oil, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Extractable Petroleum Hydrocarbons (ETPH), MA-EPH, MA-VPH, Dicamba, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Dalapon, Volatile Organics, Acid Extractables (Phenols), Benzidines, Phthalates, Nitrosamines, Nitroaromatics & Cyclic Ketones, PAHs, Haloethers, Chlorinated Hydrocarbons.)

Maine Department of Human Services Certificate/Lab ID: 2009024.
Drinking Water (Inorganic Parameters: SM9215B, 9222D, 9223B, EPA 180.1, 353.2, SM2130B, 2320B, 2540C, 4500Cl-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H+B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1, EPA 300.0. Organic Parameters: 504.1, 524.2.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, SM2320B, 2510B, 2540C, 2540D, 426C, 4500Cl-D, 4500Cl-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NO3-F, 4500P-B, 4500P-E, 5210B, 5220D, 5310C, 9010B, 9040B, 9030B, 7470A, 7196A, 2340B, EPA 200.7, 6010B, 200.8, 6020, 245.1, 1311, 1312, 3005A, Enterolert, 9223D, 9222D. Organic Parameters: 608, 624, 625, 8081A, 8082, 8330, 8151A, 8260B, 8270C, 3510C, 3630C, 5030B, ME-DRO, ME-GRO, MA-EPH, MA-VPH.)

Solid Waste/Soil (Inorganic Parameters: 9010B, 9012A, 9014A, 9030B, 9040B, 9045C, 6010B, 7471A, 7196A, 9050A, 1010, 1030, 9065, 1311, 1312, 3005A, 3050B. Organic Parameters: ME-DRO, ME-GRO, MA-EPH, MA-VPH, 8260B, 8270C, 8330, 8151A, 8081A, 8082, 3540C, 3546, 3580A, 3630C, 5030B, 5035.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.
*Drinking Water (*Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl) (EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Fluoride, Sulfate); (EPA 353.2 for: Nitrate-N, Nitrite-N); (SM4500NO3-F for: Nitrate-N and Nitrite-N); 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, 2320B, SM2540C, SM4500H-B. Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics); (504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), EPA 332. Microbiology Parameters: SM9215B; ENZ. SUB. SM9223; ColilertQT SM9223B; MF-SM9222D.)

*Non-Potable Water (*Inorganic Parameters:, (EPA 200.8 for: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn); (EPA 200.7 for: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn); 245.1, SM4500H,B, EPA 120.1,

SM2510B, 2540C, 2340B, 2320B, 4500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia-N), LACHAT 10-107-06-1-B for Ammonia-N, SM4500NO3-F, 353.2 for Nitrate-N, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 5310C, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.
Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics),(608 for: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT,Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs-Water), (EPA 625 for SVOC Acid Extractables and SVOC Base/Neutral Extractables), 600/4-81-045-PCB-Oil. Microbiology Parameters: (ColilertQT SM9223B; Enterolert-QT: SM9222D-MF.)

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM 9222B, 9223B, 9215B, EPA 200.7, 200.8, 245.2, 300.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 332.0. Organic Parameters: 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 3005A, 200.7, 200.8, 245.1, 245.2, SW-846 6010B, 6010C, 6020, 6020A, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 350.2, 351.1, 353.2, 410.4, 420.1, 426C, 1664A, SW-846 9010B, 9030B, 9040B, SM426C, SM2120B, 2310B, 2320B, 2540B, 2540D, 4500H+B, 4500CL-E, 4500CN-E, 4500NH3-H, 4500NO3-F, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 5220D, 2510B, 2540C, 4500F-C, 5310C, 5540C, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D. Organic Parameters: SW-846 3510C, 3630C, 5030B, 8260B, 8270C, 8270D, 8330, EPA 624, 625, 608, SW-846 8082, 8081A, 8081B, 8151A.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 6010C, 7196A, 7471A, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040B, 9045C, 9050, 9065,1311, 1312, 3005A, 3050B, 3060A. Organic Parameters: SW-846 3540C, 3546, 3550B, 3580A, 3630C, 5030B, 5035, 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330, 8151A, 8015B, 8082, 8082A, 8081A, 8081B.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9223B, 9215B, 4500CN-CE, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 200.8, 245.2, 2540C, SM2120B, 2320B, 2510B, 5310C, SM4500H-B. Organic Parameters: EPA 332, 504.1, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500Cl-E, EPA 300.0, SM2120B, 2340B, SM4500F-BC, EPA 200.7, 200.8, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM510ABC, SM4500P-B5+E, 2540B, 2540C, 2540D, 2540G, EPA 120.1, SM2510B, SM15 426C, 9222D, 9221B, 9221C, 9221E, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, 350.2, SW-846 1312, 7470A, 5540C, SM4500H-B, 4500SO3-B, SM3500Cr-D, 4500CN-CE, EPA 245.1, 245.2, SW-846 9040B, 3005A, 3015, EPA 6010B, 6010C, 6020, 6020A, 7196A, 3060A, SW-846 9010B, 9030B. Organic Parameters: SW-846 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3510C, EPA 608, 624, 625, SW-846 3630C, 5030B, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 1,4-Dioxane by NJ Modified 8270, 8015B, NJ OQA-QAM-025 Rev.7, NJ EPH.)

Solid & Chemical Materials (Inorganic Parameters: SW-846, 6010B, 6010C,6020, 6020A, 7196A, 3060A, 9010B, 9030B, 1010, 1030, 1311, 1312, 3005A, 3050B, 7471A, 7471B, 9014, 9012A, 9040B, 9045C, 9050A, 9065. Organic Parameters: SW-846 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8330, 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 3540C, 3546, 3580A, 3630C, 5030B, 5035L, 5035H, NJ OQA-QAM-025 Rev.7, NJ EPH.)

New York Department of Health Certificate/Lab ID: 11148. ***NELAP Accredited.***
Drinking Water (Inorganic Parameters: SM9223B, 9222B, 9215B, EPA 200.8, 200.7, 245.2, SM5310C, EPA 332.0, SM2320B, EPA 300.0, SM2120B, 4500CN-E, 4500F-C, 4500NO3-F, 2540C, SM 2510B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222B, 9215B, 5210B, 5310C, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, SM4500CL-E, 4500F-C, SM15 426C, EPA 350.1, SM4500NH3-BH, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, SM4500-NO3-F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6010C, 6020, 6020A, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, LACHAT 10-204-00-1-A, 4500CN-CE, EPA 1664A, EPA 420.1, SM14 510C, EPA 120.1, SM2510B, SM4500S-D, SM5540C, EPA 3005A, 3015, 9010B, 9030B. Organic Parameters: EPA 624, 8260B, 8270C, 8270D, 625, 608, 8081A, 8081B, 8151A, 8330, 8082, 8082A, EPA 3510C, 5030B.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010, 1030, EPA 6010B, 6010C, 7196A, 7471A, 7471B, 9012A, 9014, 9065, 9050A, EPA 1311, 1312, 3005A, 3050B, 9010B, 9030B. Organic Parameters: EPA 8260B, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8015B, 8015C, 8081A, 8081B, 8151A, 8330, 8082 8082A, 3540C, 3546, 3580, 3580A, 5030B, 5035.)

North Carolina Department of the Environment and Natural Resources Certificate/Lab ID : 666. Organic Parameters: MA-EPH, MA-VPH.

Drinking Water Program Certificate/Lab ID: 25700. (Inorganic Parameters: Chloride EPA 300.0. Organic Parameters: 524.2)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. ***NELAP Accredited.***
Drinking Water (Organic Parameters: EPA 524.2, 504.1)

Non-Potable Water (Inorganic Parameters: EPA 1312, 3005A, 200.7, 410.4, 1664A, SM2540D, 5210B, 5220D, 4500-P,BE. Organic Parameters: EPA 3510C, 3630C, 5030B, 625, 624, 608, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330)

Solid & Hazardous Waste (Inorganic Parameters: EPA 350.1, 1010, 1030, 1311, 1312, 3050B, 3060A, 6010B, 6010C, 7196A, 7471A, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065, SM 4500NH3-H. Organic Parameters: 3540C, 3546, 3580A, 3630C, 5035, 8015B, 8015C, 8081A, 8081B, 8082, 8082A, 8151A, 8260B, 8270C, 8270D, 8330)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. ***NELAP Accredited via NY-DOH.***
Refer to MA-DEP Certificate for Potable and Non-Potable Water.
Refer to NJ-DEP Certificate for Potable and Non-Potable Water.

Texas Commisson on Environmental Quality Certificate/Lab ID: T104704476-09-1. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664, 200.7, 200.8, 245.1, 245.2, 300.0, 350.1, 351.1, 353.2, 410.4, 420.1, 6010, 6020, 7196, 7470, 9040, SM 2120B, 2310B, 2320B, 2510B, 2540B, 2540C, 2540D, 426C, 4500CL-E, 4500CN-E, 4500F-C, 4500H+B, 4500NH3-H, 4500NO2B, 4500P-E, 4500 S2¯D, 510C, 5210B, 5220D, 5310C, 5540C. Organic Parameters: EPA 608, 624, 625, 8081, 8082, 8151, 8260, 8270, 8330.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1311, 1312, 9012, 9014, 9040, 9045, 9050, 9065.)

Virginia Division of Consolidated Laboratory Services Certificate/Lab ID: 460195. ***NELAP Accredited.***
Non-Potable Water (Inorganic Parameters: EPA 3005A,3015,1312,6010B,6010C,SM4500S-D, SM4500-CN-CE, Lachat 10-204-00-1-X. Organic Parameters: EPA 8260B)

Solid & Hazardous Waste (Inorganic Parameters: EPA 3050B, 1311, 1312, 6010B, 6010C, 9030B, 9010B, 9012A, 9014. Organic Parameters: EPA 5035, 5030B, 8260B, 8015B, 8015C.)

Department of Defense, L-A-B Certificate/Lab ID: L2217.
Drinking Water (Inorganic Parameters: SM 4500H-B. Organic Parameters: EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: EPA 200.7, 200.8, 6010B, 6010C, 6020, 6020A, 245.1, 245.2, 7470A, 9040B, 9010B, 180.1. 300.0, 332.0, 6860, 353.2, 410.4, 9060, 1664A, SM 4500CN-E, 4500H-B, 4500NO3-F, 4500CL-D, 5220D, 5310C, 2130B, 2320B, 2540C, 3005A, 3015, 9010B, 9056. Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A, 8082, 8082A, 8081A, 8081B, 3510C, 5030B, MassDEP EPH, MassDEP VPH.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 200.7, 6010B, 6010C, 7471A, 6860, 1311, 1312, 3050B, 7196A, 9010B, 9012A, 9040B, 9045C, 3500-CR-D, 4500CN-CE, 2540G, Organic Parameters: EPA 8260B, 8260C, 8270C, 8270D, 8270C-SIM, 8270D-SIM, 8330A/B-prep, 8082, 8082A, 8081A, 8081B, 3540C, 3546, 3580A, 5035A, MassDEP EPH, MassDEP VPH.)

The following analytes are not included in our current NELAP/TNI Scope of Accreditation:
EPA 8260B: Freon-113, 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene. **EPA 8330A:** PETN, Picric Acid, Nitroglycerine, 2,6-DANT, 2,4-DANT. **EPA 8270C:** Methyl naphthalene, Dimethyl naphthalene, Total Methylnapthalenes, Total Dimethylnaphthalenes, 1,4-Diphenylhydrazine (Azobenzene). **EPA 625:** 4-Chloroaniline, 4-Methylphenol. Total Phosphorus in a soil matrix, Chloride in a soil matrix, TKN in a soil matrix, NO2 in a soil matrix, NO3 in a soil matrix, SO4 in a soil matrix. **EPA 9071:** Total Petroleum Hydrocarbons, Oil & Grease

CHAIN OF CUSTODY

PAGE 1 OF 2

ALPHA ANALYTICAL

WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193

MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 7/17/12

ALPHA Job #: L1212650

Client Information

Client: Nunn-Armstrong Assoc.
Address: 124 Main St.
Carver, MA 02330
Phone: 508-866-8383
Fax: 508-866-9878
Email: mlaeparmstrong.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: 21 Water St.
Project Location: Cambridge
Project #: P2814
Project Manager: M. Alger
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: 7/24/12 Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #: P2814

Regulatory Requirements/Report Limits

State /Fed Program Criteria TSCA

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☒ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☒ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☒ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:

If MS is required, indicate in Sample Specific Comments which samples and what tests MS to be performed.
(Note: All *CAM* methods for inorganic analyses require MS every 20 soil samples)

use soxhlet method Rep is concrete powder

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ANALYSIS PCBs - soxhlet	Sample Specific Comments	TOTAL # BOTTLES
12650-01	EQUIPMENT BLANK	7/17/12	7:45AM	WATER	BL	X		2
-02	FLOOR-2-1 (GBWK)	7/17/12	7:40AM	CAULK		X		1
-03	FLOOR-2-2 (CAULK)		7:40AM	CAULK		X		1
-04	FLOOR-2-3		7:50AM	CP		X		1
-05	FLOOR-2-4		8:00AM	CP		X		1
-06	WALL-4-1		8:30AM	CP		X		1
-07	WALL-4-2		8:30	CP		X		1
-08	WALL-4-3		8:40	CP		X		1
-09	WALL-4-4		8:50	CP		X		1
-10	WALL-4-4 (DUP)		8:50	CP		X		1

Container Type	A
Preservative	A

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
[illegible] 7-17-12	1220	[illegible]	7/17/12 1229

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

CHAIN OF CUSTODY

PAGE 2 OF 2

Date Rec'd in Lab: 7/17/12

ALPHA Job #: L1212650

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: Nevir-Armstrong Assoc
Address: 124 Main St
Cenvr MA 02330
Phone: 508-866-8383
Fax: 508-866-9898
Email: mla@nevirarmstrong.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: 21 Water St
Project Location: Cambridge
Project #: P2814
Project Manager: M. Alger
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: 7/24/12 Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☒ Same as Client info PO #: P2814

Regulatory Requirements/Report Limits

State /Fed Program Criteria TSCA

MA MCP PRESUMPTIVE CERTAINTY --- CT REASONABLE CONFIDENCE PROTO

☐ Yes ☐ No Are MCP Analytical Methods Required?
☐ Yes ☐ No Is Matrix Spike (MS) Required on this SDG? (If yes see note in Comments)
☐ Yes ☐ No Are CT RCP (Reasonable Confidence Protocols) Required?

Other Project Specific Requirements/Comments/Detection Limits:
If MS is required, indicate in Sample Specific Comments which samples and what tests MS to be performed.
(Note: All *CAM* methods for inorganic analyses require MS every 20 soil samples)

* = CP is concrete powder use Soxhlet method

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ANALYSIS PCB's - Soxhlet	Sample Specific Comments	TOTAL # BOTTLES
12650-11	Wall-1-1	7-17-12	910	CP	BL	X		1
-12	Wall-1-2	↓	920	CP	BL	X		1
-13	Wall-1-3	↓	930	CP	BL	X		1
-14	Wall-1-4	↓	940	CP	BL	X		1
-15	Wall-3-1 (caulk)	↓	1000	caulk	BL	X	anticipating high results	1
-16	Wall-3-2 (caulk)	↓	1010	caulk	BL	X	anticipating high results	1
-17	Wall-3-3	↓	1020	CP	BL	X		1
-18	Wall-3-4	↓	1030	CP	BL	X		1

Container Type	A
Preservative	A

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	7-17-12/1220	[signature]	7/17/12 1220

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 18-Jan-2010)

APPENDIX D – SITE SPECIFIC QAPP ADDENDUM A1

NOVER-ARMSTRONG ASSOCIATES, INC.

124 Main Street, Unit 2GG
Carver, Massachusetts 02330
Telephone 508.866.8383
Facsimile 508.866.9898

SDO-certified DBE & WBE
www.noverarmstrong.com

environmental consultants & engineers

SITE-SPECIFIC QAPP ADDENDUM A1

for

Analysis of PCBs in Building Materials
MBTA Tire Maintenance Facility
21 Water Street / 183 Monsignor O'Brien Highway
Cambridge, Massachusetts

EPA QA RFA 11102

Prepared by: Nover-Armstrong Associates, Inc. (Nover-Armstrong)
124 Main Street, Unit 2GG, Carver, MA 02330
Matthew Alger, Nover-Armstrong Quality Assurance Coordinator

Date Prepared: June 2012 (Revision 1.2)

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List of Acronyms

ASTM	American Society for Testing Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGI	Combustible Gas and Oxygen Detector
COC	Chain of Custody
COPC	Contaminant of Potential Concern
DEP	Department of Environmental Protection
DOD	Department of Defense
DQO	Data Quality Objectives
EHP	Environmental Health Program
ELAP	Environmental Laboratory Accreditation Program
EMD	Environmental Monitoring Database
EPA	Environmental Protection Agency
FID	Flame ionization detector
FSS	Federal Sites Section of the Hazardous Waste Remediation Bureau
HASP	Health and Safety Plan
ID	Inside Diameter
LFS	Low Flow Sampling
MCL	Massachusetts Certified Lab
MCP	Massachusetts Contingency Plan
MDL	Method Detection Limits
NAPL	Non-Aqueous Phase Liquid
NCP	National Contingency Plan
NIST	National Institute of Standard & Technology
NELAC	National Environmental Laboratory Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NPL	National Priorities List
NTU	Nephelometric Turbidity Units
OD	Outside Diameter
ORCB	Oil Remediation & Compliance Bureau
ORP	Oxygen Reduction Potential
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PEHB	Permitting & Environmental Health Bureau
PIC	Public Information Center
PID	Photoionization Detector
PM	Project Manager
POE	Point of Entry
PQO	Project Quality Objectives
PRP	Potentially Responsible Party
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAC	Quality Assurance Coordinator
QAM	Quality Assurance Manager
QAPP	Quality Assurance Project Plan
QC	Quality Control

List of Acronyms - Continued

QMP	Quality Management Plan
QSM	Quality Systems Manual
RDL	Reporting Detection Limits
RI/FS	Remedial Investigation and Feasibility Study
RPM	Remedial Project Manager
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SOP	Standard Operation Procedure
SRP	Site Remediation Program
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds
WMD	Waste Management Division

Section 1 – Project Management

1.1 Introduction

The Brownfields Revitalization and Environmental Restoration Act of 2001 authorizes federal funding for the assessment and cleanup of contaminated properties through the USEPA's Brownfields grant program. The USEPA requires that a Quality Assurance Project Plan (QAPP) is prepared and approved by the USEPA prior to the commencement of federally funded projects involving the collection and use of environmental data.

This Site-Specific QAPP Addendum has been prepared in accordance the USEPA's Brownfields program. Assessment activities will be completed consistent with USEPA requirements and processes described in Massachusetts General Laws Chapter 21E (MGL Ch. 21E) and 310 Code of Massachusetts Regulations (CMR) 40.0000 – Massachusetts Contingency Plan (MCP).

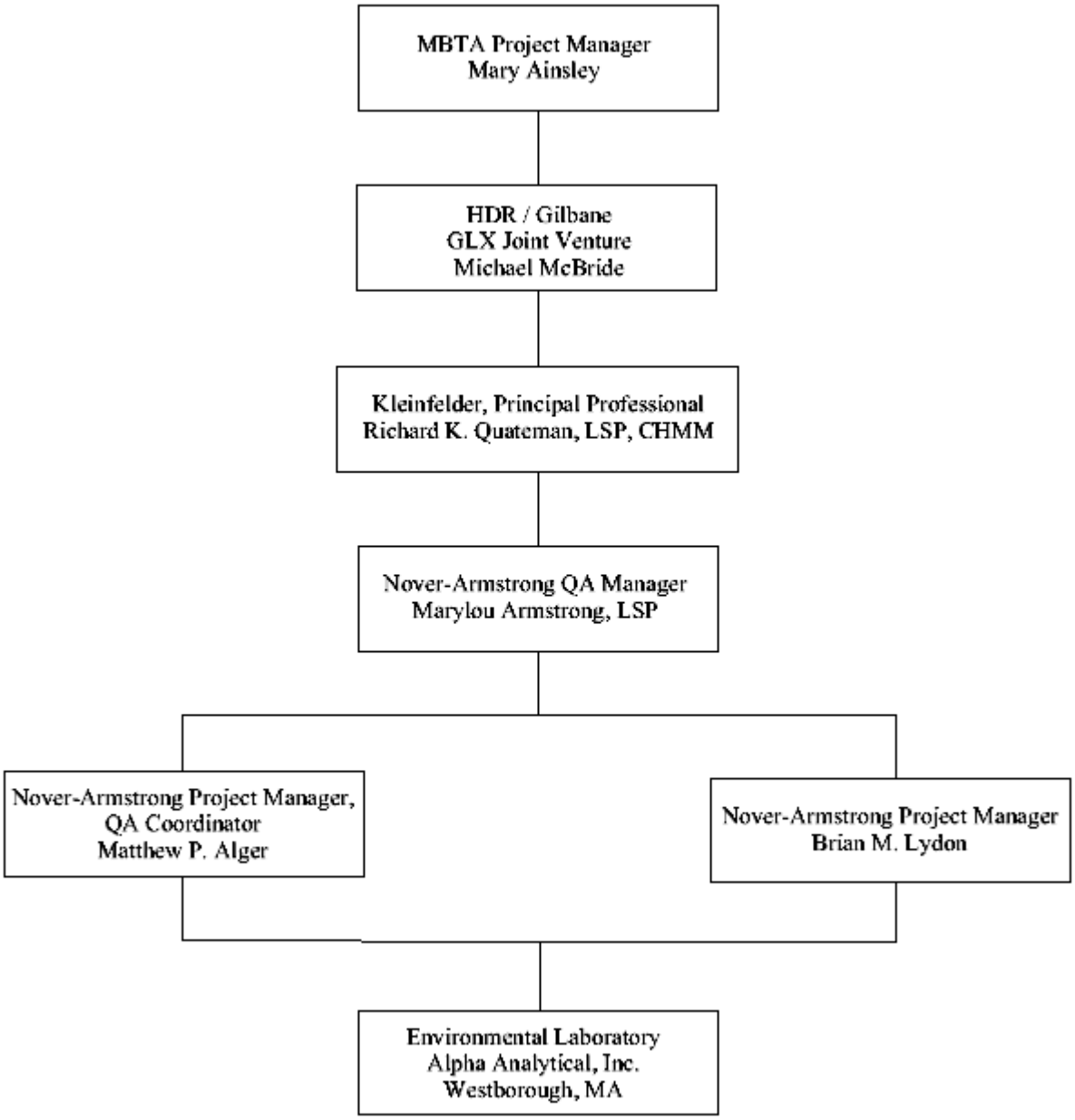
Site-Specific QAPP Addendum A1, Revision 1.2 (June 2012) for the MBTA Tire Maintenance Facility has been prepared in association with the *Generic Quality Assurance Project Plan for Nover-Armstrong Associates, Inc., Revision 1.1 (July 2011)*, RFA 11102, which was approved by the USEPA in August 2011. The work described in this Site-Specific QAPP Addendum will be performed in accordance with the processes and procedures described in the Generic QAPP.

This Site-Specific QAPP Addendum has been prepared to ensure that all sample collection and data generation activities associated with the current project yield data that are of adequate quality for their intended use.

1.2 Project Organization and Responsibility

Figure 1-1 represents a graphic illustration of the project organization and communication pathways. These are considered to be general pathways of communication and do not restrict communication between all parties, as necessary.

Figure 1-1: Project Organizational Chart



- The Quality Assurance Manager (QAM) is the key Nover-Armstrong individual responsible for quality assurance (QA). The QAM is a company Principal and communicates directly with the QA Coordinator (QAC).
- The QA Coordinator reports to the QA Manager and is the liaison between the QA Manager and all other Nover-Armstrong personnel. The QA Coordinator reviews analytical reports received from state-certified laboratories for quality control.

- The Nover-Armstrong Principals interact directly with the Project Managers, the QA Coordinator, and the QA Manager.
- The Project Managers report to the Principals and coordinate activities with the QA Coordinator and QA Manager.
- The analytical laboratory sends reports to the QA Coordinator, after having audited the results in accordance with their Standard Operation Procedures (SOPs).

Nover-Armstrong field sampling personnel shall have received training in accordance with Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 (e) including annual refresher courses. All training shall be documented. Training records shall be maintained by the employer of the staff and be available upon request. Standard safety practices shall be employed, and appropriate protective clothing shall be worn during all site visits.

Appropriate and effective health and safety practices shall be integrated into all daily operations to promote safe and healthful working conditions. At minimum, procedures shall comply with OSHA and other applicable local, State, and federal laws and regulations.

1.3 Problem Definition

The Green Line Extension Project (GLX) will provide light rail service from the relocated Lechmere Station using a two-branch operation. The existing Lechmere Station, the terminus of the existing alignment, will be relocated to 21 Water Street / 183 Monsignor O'Brien Highway in Cambridge, the current location of the MBTA Tire Maintenance Facility (the site). The current site building will be demolished as part of the project. Refer to Figure 1-2: Site Location.

Nover-Armstrong completed an Initial Hazardous Materials Survey at the site in November 2011. The MBTA Tire Maintenance Facility consists of an approximate 11,914 square foot concrete block building that is scheduled to be demolished as part of the GLX project. The site is currently owned by the Massachusetts Bay Transportation Authority (MBTA). As part of the Initial Hazardous Materials Survey, building materials were inspected for potential presence of polychlorinated biphenyls (PCBs). Visual inspection revealed window caulking, floor caulking, wall caulking, and wall mortar that were considered potential PCB sources. There are forty (40) windows throughout the facility. Building materials were observed to be in poor to good condition, with areas of isolated damage. The building material samples were submitted to Alpha Analytical, Inc. (Alpha) and analyzed for PCBs via EPA Method 3540C (Soxhlet Extraction Method).

Concentrations of PCBs were detected in all window caulking samples, all floor caulking samples, one wall caulking sample, and two of three wall mortar samples. PCB concentrations ranged from 110,000 parts per million (ppm) to 993,000 ppm in the window caulking samples. Lower PCB concentrations ranging from 0.172 ppm to 40.4 ppm were detected in floor caulking, wall caulking, and wall mortar samples.

Review of the analytical laboratory report revealed that 16.2 ppm PCBs was also detected in the Method Blank sample. Nover-Armstrong contacted Glen Breland of Alpha relative to the detection of PCBs in the Method Blank. Mr. Breland stated that the Method Blank was run as part of the sample batch. During the soxhlet extraction and / or blow down process, the Method Blank (and potentially some of the building material samples) was contaminated from the window caulking samples containing very high PCB concentrations run at the beginning of the batch. Therefore, samples containing less than 16 ppm PCBs may not contain PCBs or may have concentrations less than the concentrations reported by Alpha

in their laboratory report. A screening process will be used by Alpha for samples collected as part of this Site-Specific QAPP Addendum to identify samples with high PCB concentrations prior to Soxhlet extraction in order prevent cross-contamination. This screening process is described further in Section 2.9 and Appendix A.

Analytical results revealed window caulking, floor caulking, wall caulking, and wall mortar containing PCB concentrations. Nover-Armstrong recommended additional assessment of building materials and ground surfaces surrounding the windows and surrounding impacted floor and wall samples, per TCSA requirements. Due to the detection of PCBs within the Method Blank sample, Nover-Armstrong recommended re-sampling and analysis of the building materials with PCB concentrations between 1 and 50 ppm to determine / confirm the presence of PCBs.

Site-Specific QAPP Addendum A1 is being implemented for the analysis of PCBs in concrete masonry units (CMU) surrounding the windows of the facility and in building materials (concrete, caulking, and mortar) surrounding impacted floor and wall samples. The goal of this project is to identify potential PCB impacts from window caulking, floor caulking, wall caulking, and/or wall mortar leaching into building materials adjacent to the previously-identified PCB-impacted areas and to assess the limits of PCB contamination, if identified. Additional assessment and/or remediation work may be required based on the outcome of this project. One or more QAPP Addenda will be prepared for any such additional work (if required). Potential additional assessment of ground surfaces surrounding the windows will be addressed in a separate Site-Specific QAPP Addendum, if required.

1.4 Project Description and Timeline

Project Description

In accordance with EPA Protocols, Nover-Armstrong will conduct concrete sampling & analysis to assess limits of PCB contamination in CMUs surrounding building windows and in building materials (concrete, caulking, and mortar) surrounding impacted floor and wall samples.

- Ten windows to be sampled (representing 25 % of windows).
- Eight samples per window area will be obtained using EPA Sampling Protocols (including Level C PPE). Samples will be obtained from all four sides of each window at a distance from the window equaling approximately one-half of a CMU length.
- Four samples will be obtained using EPA Sampling Protocols from areas surrounding each of four building material sampling locations previously identified during the November 2011 Initial Hazardous Materials Survey as containing PCBs. These samples were identified as WALL-1, WALL-3, WALL-4, and FLOOR-2. Samples will be obtained from all four sides of each location at a distance of six to twelve inches.
- A minimum of 96 samples will be analyzed for PCBs (Soxhlet Method – SW846 3540C/8082).
- Up to ten additional samples may be collected and analyzed, as deemed appropriate based on field observations, along cracked, rusted areas in line with the windows to assess for potential PCB migration through the concrete.
- No field screening will be performed.
- Sampling equipment will be decontaminated between sample collections.
- Up to six Duplicate Samples (frequency of 1 duplicate per 20 samples) & six Equipment Blanks (frequency of 1 blank per 20 samples or 1 blank per day, whichever is more frequent) will be collected for QA/QC purposes.
- Analytical results will be compared against applicable USEPA regulatory standards.

- Soil surfaces outside of the building will be visually inspected to evaluate the potential presence of visible caulk waste (pieces / debris) and/or caulk paint waste (chips / flakes). This visual inspection information, along with the analytical data, may be used to assess whether PCBs weeping out of the caulk and/or deteriorating caulk materials could have reached the soil outside of the building.

Timeline

Building Material Sampling / Analysis for PCBs (Field Activities)	July 9-13, 2012
Laboratory Analytical Results Available for Review	July 20, 2012
Written Deliverable with Results & Findings	July 27, 2012

Section 2 – Measurement Data Acquisition

2.1 Sampling Design and Site Figures

CMUs Surrounding Windows

As outlined in Section 1.4, Nover-Armstrong will collect concrete samples from CMUs adjacent to selected windows at the site. The samples will be collected in ten groups (Groups A through J), as depicted in Figure 2-1. Each group is comprised of eight grab sampling points. The spatial distribution of samples collected from CMUs surrounding individual windows is depicted in Figure 2-2. The samples will be obtained from all four sides of each window at a distance from the window equaling approximately one-half of a CMU length. As noted in Section 1.4, up to ten additional samples may be collected, as deemed appropriate based on field observations, along cracked, rusted areas in line with the windows to assess for potential PCB migration through the concrete.

The concrete samples will obtained following the guidance provided in the USEPA Region 1 *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs), Revision 4 (May 2011), EIASOP_POROUSSAMPLING* and in accordance with the Code of Federal Regulations (CFR) 40 CFR 761 . Refer to Appendix A – Standard Operating Procedures.

A rotary impact hammer equipped with a one-inch diameter carbide drill bit will be used to generate a fine concrete powder, which will be collected into appropriate containers provided by the laboratory. Samples will be collected from each sampling location at a depth of 0-1.0 inch into the exterior concrete wall surface. Samples will be collected at ½-inch depth intervals. Thus, the initial surface sample will be collected from 0-0.5 inches. The second sample will be collected from 0.5-1.0 inches. A ½-inch deep hole generates approximately 10 grams (20 mL) of powder. According to Ms. Leslie Coon of Alpha, a minimum of approximately 50 grams of concrete powder is required for PCB and total solids analysis. Therefore, two to three 1-inch holes located closely adjacent to each other will be needed to generate sufficient sample volume for a PCB determination. Level C Personal Protective Equipment (PPE) will be utilized during sampling activities to minimize exposure to concrete dust.

A total of up to 90 concrete grab samples from surrounding the windows, not including field quality control samples, will be submitted for laboratory analysis of PCBs (Soxhlet Extraction Method – SW846 3540C/8082).

Building Materials Surrounding Previously-Identified PCB-Impacted Sample Locations

As outlined in Section 1.4, Nover-Armstrong will collect four samples from areas surrounding each of four building material sampling locations previously identified during the November 2011 Initial Hazardous Materials Survey as containing PCBs. These samples were identified as WALL-1, WALL-3, WALL-4, and FLOOR-2. Refer to Figure 2-3 for sampling locations. The samples will be obtained from all four sides of each sampling location at a horizontal distance of six inches from the previous (November 2011) sample, except for two floor caulking samples collected from the floor seam near FLOOR-2, which will be obtained at a horizontal distance of twelve inches from the November 2011 sample. The building material samples will consist of concrete, caulking, or mortar, depending on the sampling location.

The building material samples will obtained following the guidance provided in the USEPA Region 1 *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs), Revision 4 (May 2011), EIASOP_POROUSSAMPLING* and in accordance with the Code of Federal Regulations (CFR) 40 CFR 761 . Refer to Appendix A – Standard Operating Procedures.

For concrete and mortar samples, a rotary impact hammer equipped with a one-inch diameter carbide drill bit will be used to generate a fine concrete and/or mortar powder, which will be collected into appropriate containers provided by the laboratory. Samples will be collected from each sampling location at a depth of 0-1.0 inch into the wall and/or floor surface. Samples will be collected at ½-inch depth intervals, as described above, to generate approximately 50 grams of concrete and/or mortar powder for analysis. Level C Personal Protective Equipment (PPE) will be utilized during sampling activities to minimize exposure to concrete and/or mortar dust.

For caulking samples, a chisel or sharp knife will be used to generate representative samples.

A total of up to 16 grab samples from surrounding the previously-identified PCB-impacted sample locations, not including field quality control samples, will be submitted for laboratory analysis of PCBs (Soxhlet Extraction Method – SW846 3540C/8082).

2.2 Sampling and Analytical Methods Requirements

Table 2-1 lists the Sampling and Analytical Methods Requirements table that will be used for this site-specific QAPP addendum. The table is designed to provide a detailed summary of samples being collected for the project. Refer to Appendix A – Standard Operating Procedures.

Table 2-1: Sampling and Analytical Methods Requirements Table

Sample Description			QA/QC		SOPs			Container			Preservation	
Parameter	**Matrix**	**Samples**	**Dupl.**	**Equip. Blank**	**Field Sampling SOP**	**Method**	**Lab SOP**	**#**	**Size**	**Type**	**Sample Preservation**	**Hold Time**
Polychlorinated Biphenyls (PCBs)	Concrete Powder	106	6	6	EIASOP_ POROUS SAMPLI NG	Soxhlet Method – SW846 3540C/ 8082	1954; 2129	1	120 mL	Glass Jar w/ Teflon-lined cap	4º C	None

2.3 Method and SOP Reference Table

Table 2-2: Site-Specific Method and SOP Reference Table

SOP Number	Procedure Name	Revision Number	Revision Date	SOP Author	Analytical Method Name	Analytical Method Number	Method Revision Number	Method Revision Date
EIASOP_POROUSSAMPLING	Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs)	4	05.2011	USEPA	N/A	N/A	N/A	N/A
SOP.NAA_C.01.1	Field Documentation	1	07.2011	Nover-Armstrong Assoc., Inc.	N/A	N/A	N/A	N/A
SOP.NAA_C.05.1	Equipment Decontamination	1	07.2011	Nover-Armstrong Assoc., Inc.	N/A	N/A	N/A	N/A
SOP.NAA_C.07.1	Chain of Custody Sample Handling & Shipping	1	07.2011	Nover-Armstrong Assoc., Inc.	N/A	N/A	N/A	N/A
2129	PCBs by Capillary Column Gas Chromatography	2	4.27.2012	Alpha Analytical, Inc.	PCBs by Capillary Column Gas Chromatography	USEPA SW-846 Method 8082	Update III	1997
1954	Soxhlet Extraction	2	5.10.2012	Alpha Analytical, Inc.	Soxhlet Extraction	USEPA SW-846 Method 3540C	Update III	1997

Notes: N/A - Not Applicable

2.4 Field Equipment Calibration and Corrective Action

Table 2-3 lists the equipment needed for Site-Specific QAPP Addendum A1. The field equipment that will be used for the building material sampling does not require calibration. The impact hammer will be checked on a daily basis to ensure proper function. The PPE will be inspected before and after each use to ensure its integrity and effectiveness. Sampling equipment shall be cleaned (decontaminated) before use to minimize the potential for cross-contamination and whenever possible, new/unused sampling equipment shall be utilized.

Table 2-3: Field Equipment List

Equipment Type	Model
Makita 6 Amp 5/8" Hammer Drill	HP1640
Dewalt Premium Percussion 1" x 12" Carbide Drill Bit	DW5249
Hilti TE-C ½" Carbide Hammer Drill Bit	385080
North Safety Silicone Half Mask	7700 Series
North Safety Air-purifying Filters	7580P100
Spoon, chisel & knife (for sample collection)	N/A
Decontamination supplies	Refer to SOP.NAA_C.05.1

All pertinent manufacturers' equipment manuals and any manufacturer-provided repair kits will be on-site at all times during the sampling event. All instrumentation necessary for health and safety purposes shall be maintained, tested and inspected according to the manufacturer's instructions.

See Appendix A for the Nover-Armstrong Decontamination SOP (SOP.NAA_C.05.1) and the guidelines for decontamination provided in the USEPA SOP (EIASOP_POROUSSAMPLING). Disposable sampling equipment shall be discarded after completing the sampling task and not reused. Decontamination of equipment will generate potentially contaminated rinse liquids that will need to be containerized on-site until proper disposal arrangements are made. The rinse liquids will be stored at the site in an industrial-type 55-gallon DOT-approved steel drum secured with a locking bolt ring. The rinse liquids will be tested prior to off-site disposal to determine if they must be transported to a hazardous waste facility. If it is determined that the rinse liquids are not contaminated, they will be disposed of on-site.

The rinse liquids will be tested at the conclusion of the sampling event (approximate three to five day duration). Analytical turnaround time for the rinse liquid sample will be ten business days. Following receipt of analytical results, the rinse liquids will either be disposed on-site or approval will be obtained for acceptance at a disposal facility. A licensed waste disposal contractor will be hired to transport the rinse liquids to the disposal facility. Therefore, the rinse liquids could remain on-site for up to one month from generation to disposal.

2.5 Laboratory Equipment Calibration and Corrective Action

The SOPs provided in Appendix A contain the laboratory equipment calibration QA/QC information.

2.6 Sample Handling and Custody Requirements

The USEPA Region 1 *Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls (PCBs), Revision 4 (May 2011), EIASOP_POROUSSAMPLING*, which is provided in

Appendix A contains detailed sample handling instructions for the building material samples that will be collected by Nover-Armstrong for PCB analysis.

Analytical services shall be provided by Alpha Analytical, Inc. (Alpha) of Westborough, MA. Alpha is currently accredited under the National Environmental Laboratory Accreditation Conference (NELAC) standards and has its own quality assurance manual and standard operating procedures (SOPs) that meet the NELAC standards. Alpha is accredited for the specific matrix / method / analyte for which testing is required and maintains its own separate quality assurance manual.

The building material samples will be collected into 120 mL amber jars with teflon-lined caps. Containers shall be obtained from the analytical lab and shall be clean and free of contamination. The jars will not contain chemical preservatives. Care shall be taken during sampling to ensure that material is not spilled onto the outer surface of containers, and that lids are placed on tightly after sampling. At least 50 grams of sample material will be collected, in accordance with laboratory requirements. Containers shall be labeled with the date and time sampled, sample location, collectors initials, sample number, project name or number, preservative and any other pertinent information. Information shall be documented in field notebooks/worksheets and chain of custody forms. Alpha does not require sample preservation or a specific holding time for samples being analyzed for PCBs; however, the laboratory does require samples to be cooled to 4°C using ice prior to delivery. Refer to Section 2.2, Table 2-1 Sampling and Analytical Methods Requirements Table.

See Appendix A for the Nover-Armstrong Chain of Custody Sample Handling & Shipping SOP (SOP.NAA_C.07.1). Samples and empty sample containers shall remain in the sample collector's view at all times, unless locked in a vehicle or other secure place. It is the sampler's responsibility to ensure that the samples are not tampered with prior to their delivery to the analytical lab. The Chain of Custody (COC) form shall be completed to provide documentation tracing sample possession and handling from the time of collection through delivery to the analytical lab, and shall accompany the samples at all times. The COC is a legal document that may be used for litigation purposes. The current COC used by Alpha is attached within the Chain of Custody Sample Handling & Shipping SOP in Appendix A. The completed original COC shall be attached to the analytical report which is submitted to Nover-Armstrong, and becomes part of the permanent project record.

Samples shall be properly packaged in a cooler for shipment to maintain sample integrity and delivered to the analytical laboratory along with a separate signed COC form enclosed in each sample cooler. As noted, samples will be cooled to approximately 4°C using ice prior to delivery to the analytical laboratory.

Lab personnel shall log the samples into their computer in accordance with their standard operating procedure. The samples shall be inspected by qualified laboratory personnel. A Sample Receipt Checklist shall be used to document the receipt of the samples and shall include checks for breakage, correct container, temperature of the cooler, holding times, and for other factors that may affect quality. The samples shall be compared to their description on the COC form, and discrepancies in the number or the designations of the samples shall be noted on the form and shall be brought to the attention of the person who relinquished the samples to the lab. If necessary, the contact person on the chain of custody may be contacted for further instruction. Since samples may be held in the lab untouched until discrepancies are resolved, there could be an impact on sample holding times.

The COC form shall be signed and the date and time shall be recorded to formally accept the samples into laboratory custody. The analytical laboratory shall assign laboratory numbers to the samples, and these numbers shall be recorded on the chain of custody forms.

2.7 Analytical Sensitivity and Project Criteria

Refer to Appendix B for an Analytical Method Sensitivity and Project Criteria Table for analytical methods that are routinely performed by Alpha, including the methods that will be utilized for this project. The table includes routine analytes, MDLs, RDLs, regulatory standards, etc. As of the date of this site-specific QAPP addendum, the current state and/or federal standards have been incorporated into this table and the reporting limits and standards have been reviewed for accuracy.

2.8 Field Quality Control Requirements

The following are field quality control samples that will be utilized for this project:

- Equipment Blanks

  Equipment blanks consist of a sample of distilled/deionized (analyte-free) water which has been poured around and through sample collection equipment to determine if contamination has occurred due to improper cleaning and/or contamination of equipment. They shall be handled like any other sample and submitted with the other samples for analysis. The frequency shall be one equipment blank per 20 samples collected or one equipment blank per day sampling, whichever is more frequent.

- Duplicate samples

  Duplicate samples shall be collected for each batch of samples collected per matrix, per analysis. A batch is a sample delivery group that is analyzed together (a batch may not exceed 20 samples). The duplicates shall be collected at the same time, in the same manner as their corresponding routine samples and shall be identified in the field notes and logged on the chain of custody forms.

Table 2-4: Field Quality Control Requirements Table

QC Sample	Frequency	Acceptance Criteria	Corrective Action
Field Duplicate	1 duplicate per batch 20 samples	Duplicate concentrations are within +/- 50% for solid samples	Flag in project report
Equipment Blank	1 equipment blank per batch 20 samples or 1 equipment blank per day sampling, whichever is more frequent	No contaminants are detected	Flag in project report

Notes:

- Duplicate samples are not intended to be blind duplicate samples. They will be designated with a “DUP” after the sample designation (i.e. CMU-1_DUP).

- Equipment blank samples will be designated as "EQUIP BLANK". Note that a comment is required on the chain of custody indicating what the equipment blank is for (i.e. impact hammer drill bit).

2.9 Laboratory Quality Control Requirements

The SOPs provided in Appendix A contain the laboratory quality control procedures routinely performed for each parameter and matrix. A screening process will be used by Alpha for samples collected as part of this Site-Specific QAPP Addendum to identify samples with high PCB concentrations prior to Soxhlet extraction in order prevent cross-contamination.

2.10 Data Management and Documentation

All Nover-Armstrong Project Managers will be required to review this site specific QAPP addendum and sign the "QAPP Project Personnel Log Sheet" which documents that they have reviewed this QAPP and will follow the procedures as described. The "QAPP Project Personnel Log Sheet" is found in Appendix C.

Field personnel shall use field logbooks and/or pre-printed work sheets to accurately document all field activities: on-site conditions; field measurements; sample collection information; field instrument and calibration information; and other pertinent site-related information during monitoring activities. Refer to Appendix A for Nover-Armstrong's Field Documentation SOP (SOP.NAA_C.01.1). The field notes shall include a description of field conditions that includes, as a minimum:

- Site location;
- Date, start, and finish times of the work and weather conditions;
- Name and initials of person making entry;
- Names of other personnel present, if any;
- Names of visitors, if any;
- Purpose and summary of proposed work effort;
- Details of any deviation from the field operations plan or standard operating procedures, including who authorized the deviation;
- Field observations;
- Sampling equipment used (including make model and serial number);
- Fixed laboratory sample identification number, sample type (grab), time of sampling, sample analysis, and sample locations shown on a near-scale map relative to a fixed landmark;
- Sample handling, packaging, labeling, and shipping information (including destination);
- Location, description and unique identifier for all photographs taken in association with the field activity; and
- Any other pertinent information.

Information recorded in other site documents, *e.g.*, sampling logs, will not be repeated in logbooks except in summary form. Any corrections to the logbook or other written documentation shall be initialed and dated. All corrections shall be shown as a single line through the original. The unused bottom portion of each page shall be lined-out, initialed, and dated.

All site related reports and project plans including QAPPs, laboratory reports, site sampling reports, and annual reports shall be submitted and maintained in electronic project files and reviewed by the appropriate Project Manager to evaluate the usability of the data and assure compliance with the elements of this QAPP.

All electronic copies of company files are saved on the Nover-Armstrong server as they are generated. The data on the server is backed up daily and retained indefinitely.

Section 3 – Assessment and Oversight

3.1 Assessments and Response Actions

Data Assessment

All data generated shall be reviewed by the contractor and the Project Manager to ensure that the data has met the objectives and requirements of this QAPP and that the results are technically valid, reliable, and usable. Sampling and analytical results shall be reviewed to determine if:

- Corrective action is necessary;
- The sampling plan should be revised; or
- The site should be re-sampled.

In order to ensure that the data has met the objectives and requirements of this QAPP and that the results are technically valid, reliable and usable, data shall be reviewed and compared with relevant documentation such as:

- Available Historical data;
- Laboratory MDL and RDL;
- Standards established by the MassDEP and EPA;
- Current MassDEP and EPA policies; and
- Other pertinent documents as needed.

If data of questionable quality is reported or other quality control issues are uncovered, the Project Manager shall report the issues to the QA Coordinator and/or QA Manager. The Project Manager, with input from quality assurance personnel, shall determine the usefulness of data in question and at minimum shall summarize that data concerns in the report for which the data was generated.

The need for corrective action, including the collection of new or additional samples, shall be determined based on the data quality objectives for the project and with input from quality assurance and other appropriate personnel.

The laboratories provide the necessary Analytical Method Report Certification Forms, case narratives, and QA/QC data reporting. The lab certifies that the required QA/QC procedures were followed, and all performance/acceptance standards for the required QA/QC procedures were achieved or discussed.

It is the Project Manager's responsibility to ensure that all sampling procedures and techniques are conducted in accordance with the QAPP and any site specific QAPPs. This can best be assured by the use of field audits.

Nover-Armstrong quality assurance personnel shall periodically conduct separate field audits, review field methods, analytical procedures and/or document tracking and record keeping practices, to assure compliance with the elements of this QAPP.

Corrective Action

Corrective actions must be taken as soon as possible when data or field procedures are found to be of questionable quality. Any suspected problems shall be brought to the attention of the Nover-Armstrong Project Manager and the QA Coordinator.

The need for corrective action may be identified in many ways. The corrective action steps are:

- Identification and definition of the problem;
- Investigation of the problem;
- Determination of the cause of the problem and appropriate corrective action (this may include the need for additional training);
- Implementation of the corrective action;
- Verification that the problem has been corrected;
- Modification of procedures, as necessary, to prevent recurrence; and document the events.

3.2 Project Reports

Technical reports documenting the findings of site sampling work shall be generated by Nover-Armstrong. One technical report detailing the analytical results for PCBs in CMUs surrounding the windows of the facility will be generated for Site-Specific QAPP Addendum A1.

The report will include the following information:

- Summary of sampling activities;
- A copy of the complete laboratory report, including the chain of custody forms and applicable data validation reports;
- A list of equipment used;
- A copy of all field sampling logs;
- Site map;
- Data summary tables of the compounds of concern detected at each sampling location during the current sampling event;
- A Quality Assurance/Quality Control Section;
- Recommendations for any remedial action; and
- Recommendations for future modifications to the current monitoring program or to the site-specific QAPP, if appropriate.

Section 4 – Data Evaluation

4.1 Field Data Evaluation

The primary QA objective for all projects is to assure that all measurements are representative of actual site conditions and that all data resulting from field, sampling, and analytical activities be comparable and generated in a scientifically valid and legally defensible manner. It is important that the data collected are of known and documented quality. Any party generating data under this program has the responsibility to implement minimum procedures to assure that the precision, accuracy, completeness, and representativeness of its data are known and documented. The use of accepted, published sampling and

analysis methods, as well as the use of standardized units, aid in ensuring the comparability of the data. The Standard Operating Procedures (SOPs), as included in Appendix A of this project plan, have been developed to meet this objective.

4.2 Laboratory Data Evaluation

Data quality objectives (DQOs) are qualitative or quantitative statements developed by the data user to specify the quality of the data needed from a particular activity to support specific decisions. The DQOs are the starting point in designing a sampling program. The DQO development process matches sampling and analytical capabilities to the data targeted for specific uses and ensures that the quality of the data meets project requirements. The DQOs for this project are to identify potential PCB impacts from window caulking, floor caulking, wall caulking, and/or wall mortar leaching into building materials adjacent to the previously-identified PCB-impacted areas and to assess the limits of PCB contamination, if identified. Additional assessment and/or remediation work may be required based on the outcome of this project. One or more QAPP Addenda will be prepared for any such additional work (if required). Potential additional assessment of ground surfaces surrounding the windows will be addressed in a separate Site-Specific QAPP Addendum, if required.

Nover-Armstrong will accept the limits of precision and accuracy for analytes that have been established by the QA Office of the state-certified laboratory. The laboratories provide the necessary Analytical Method Report Certification Forms, case narratives, and QA/QC data reporting. In an effort to verify that the data collected were suitable for use in Site Characterization, the Project Manager and QA Coordinator will review the laboratory analytical reports generated as part of the assessment activities. This review will include the report narratives, surrogate recovery results, and the Analytical Method Report Certification Forms included in the data package.

Nover-Armstrong will accept the Method Detection Limits (MDL) and the Reportable Detection Limits (RDL) established by the state-certified laboratory. It is the Project Manager's responsibility to ensure that the laboratory's quality assurance program, including the MDL's, RDL's and limits of precision and accuracy for any quality control sample, support their DQOs and PQOs. Refer to Appendix B for a summary table of analytical test methods, laboratory RDLs/MDLs and regulatory action limits for all compounds tested on site.

The MassDEP *Compendium of Quality Control Requirements and Performance Standards for Selected Analytical Protocols* (CAM) (Policy #WSC-10-320) provides a series of required protocols for the acquisition, analysis, and reporting of analytical data in support of MCP decisions (a) to satisfy the broad quality assurance (QA) and quality control (QC) requirements of 310 CMR 40.0017 and 40.0191 regarding the scientific defensibility, precision and accuracy, and reporting of analytical data and (b) to meet the requirements and specifications for those parties who wish to obtain "Presumptive Certainty" for analytical data that may be used in a data usability and representativeness assessment, as required in 310 CMR 40.1056(2)(k) for Response Action Outcome (RAO) submittals, consistent with the guidance described in MassDEP Policy #WSC-07-350, *MCP Representativeness Evaluations and Data Usability Assessments*.

Nover-Armstrong's laboratory data evaluation standards and protocols will adhere to the MassDEP CAM and other MassDEP policies. The following paragraphs consist of MassDEP's definition of "Presumptive Certainty," the procedures required to obtain "Presumptive Certainty," and the role of "Presumptive Certainty" in a data usability and representativeness assessment.

The term "Presumptive Certainty" as used in Sections I through IX of the CAM describes a particular status for analytical or environmental monitoring data used in support of MCP Response Action submittals. Obtaining "Presumptive Certainty" status is just one of a number of options available to satisfy the data quality requirements for MCP submittals described in 310 CMR 40.0017, 40.0191 and 40.1056(2)(k). It should be clearly understood that exercising the "Presumptive Certainty" option is discretionary. However, *parties who elect not to utilize the "Presumptive Certainty" option have an obligation, pursuant to 310 CMR 40.0017 and 40.0191(2)(c), to demonstrate and document an overall level of QA/QC (laboratory and field), data usability, and data representativeness adequate for the intended use of the data.*

In order to achieve "Presumptive Certainty" for analytical data, parties must:

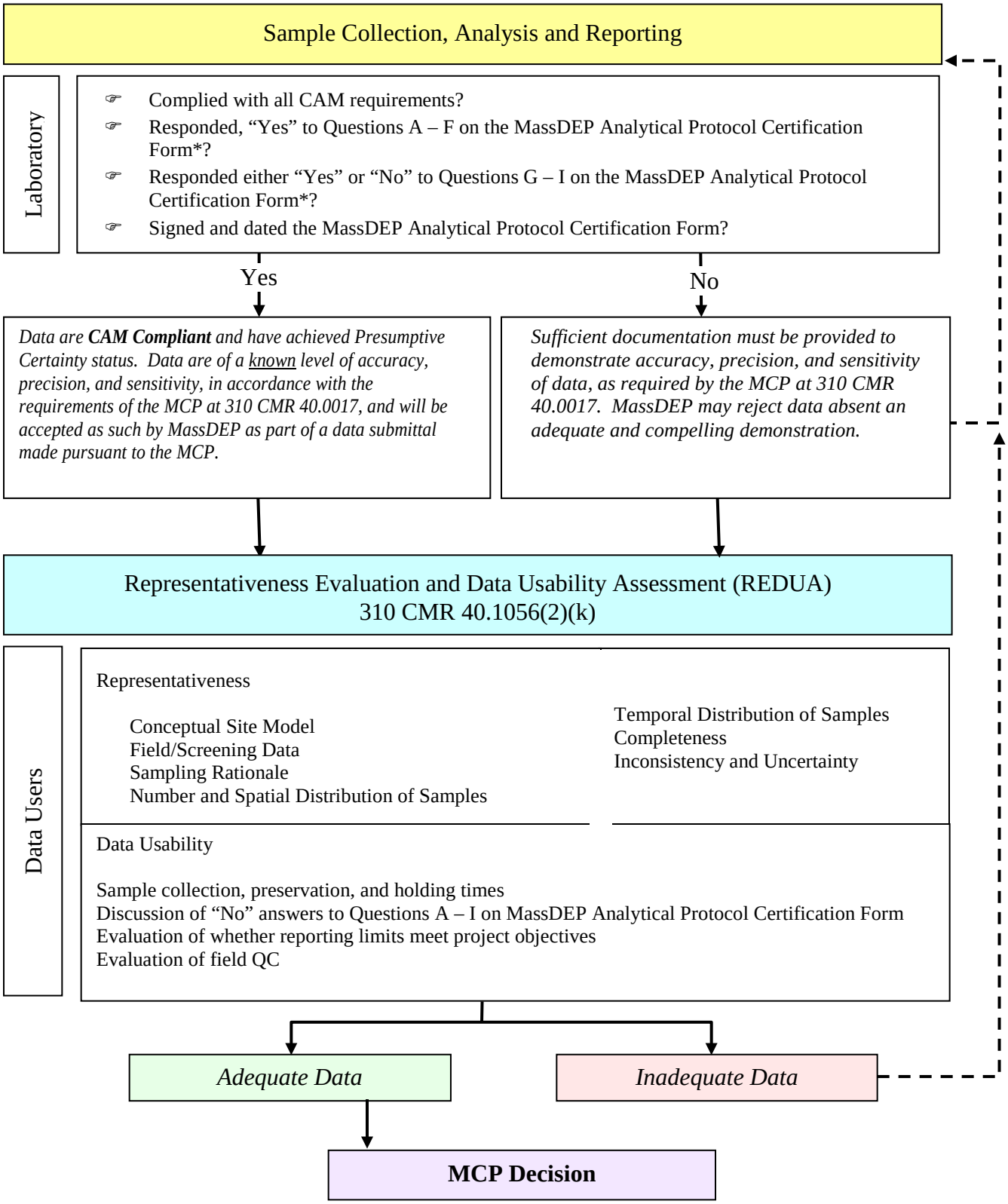
(a) Use the analytical method specified for the selected CAM protocol;
(b) Incorporate **all** required analytical QC elements specified for the selected CAM protocol;
(c) Implement, as necessary, required corrective actions and analytical response actions for **all** non-conforming analytical performance standards;
(d) Evaluate and narrate, as necessary, **all** identified CAM protocol non-compliances; and
(e) Comply with **all** the reporting requirements specified in WSC-CAM-VII A, including retention of reported and unreported analytical data and information for a period of ten (10) years.

In achieving "Presumptive Certainty" status, parties will be assured that analytical data sets:

- ✓ Satisfy the broad QA/QC requirements of 310 CMR 40.0017 and 40.0191 regarding the scientific defensibility, precision and accuracy, and reporting of analytical data; and
- ✓ May be used in a data usability and representativeness assessment, as required in 310 CMR 40.1056(2)(k) for RAO submittals, consistent with the guidance described in MassDEP Policy #WSC-07-350, *MCP Representativeness Evaluations and Data Usability Assessments*.

A logic diagram detailing the "Presumptive Certainty" approach is presented in Figure 4-1 (from MassDEP Policy #WSC-10-320).

Figure 4-1: MassDEP Presumptive Certainty and REDUA Concept



As indicated in Figure 4-1, use of the CAM and achievement of a "Presumptive Certainty" status will produce an analytical data set that will be accepted by agency reviewers for subsequent evaluation of data usability and representativeness.

It is stressed that "Presumptive Certainty" requirements are to be considered minimum requirements. Efforts that go beyond these minimum requirements (e.g., including additional points in a calibration curve) are considered compliant with the "Presumptive Certainty" concept and provisions, and need not be identified and discussed as an "exception."

The most recent version of the CAM is posted on the MassDEP's web site at http://www.mass.gov/dep/cleanup/laws/qaqcdocs.htm#I.

4.3 Data Usability and Project Evaluation

Data usability refers to the extent to which a data set can adequately meet specific site characterization needs and data quality objectives. For parties who elect to follow the specifications in the CAM, data will be considered usable for all subsequent data usability evaluations if all provisions and standards of the MCP Analytical Methods are met, including percent recovery limits for (any) method surrogate spikes and achievement of necessary (site-specific) Reporting Limits.

The overall project will be evaluated by the Nover-Armstrong Project Manager and QA Coordinator, at a minimum. The evaluation will include tabulation of data, comparison of data to state and/or federal standards, graphical representations of data and sampling locations, data usability and representativeness evaluation, interpretation of trends and anomalies, and formulation of conclusions. The evaluation will include a determination as to whether or not the project objectives were achieved and what additional actions may be required at the site.

Section 5 – References

United States Environmental Protection Agency (USEPA). 2001. *EPA Requirements for Quality Assurance Project Plans* (EPA QA/R-5).

United States Environmental Protection Agency (USEPA). 2002. *EPA Guidance for Quality Assurance Project Plans* (EPA QA/G-5).

United States Environmental Protection Agency (USEPA). 2007. *Guidance for Preparing Standard Operating Procedures (SOPs)* (EPA QA/G-6).

United States Environmental Protection Agency (USEPA). 2000. *Guidance for Data Quality Assessment: Practical Methods for Data Analysis* (EPA QA/G-9).

United States Environmental Protection Agency (USEPA) Region 1. 2010. *Quality Assurance Project Plan Program Guidance*.

United States Environmental Protection Agency (USEPA) Region 1. 2009. *Planning and Documenting Brownfields Projects, Generic Quality Assurance Project Plans, and Site-specific QAPP Addenda*.

United States Environmental Protection Agency (USEPA). 2005. *Polychlorinated Biphenyl (PCB) Site Revitalization Guidance Under the Toxic Substances Control Act (TSCA).*

Code of Federal Regulations (CFR) 40 CFR 761

United States Environmental Protection Agency (USEPA). 2008. *Revitalizing Contaminated Sites: Addressing Liability Concerns (The Revitalization Handbook).*

Massachusetts Department of Environmental Protection (MassDEP). 2010. *Compendium of Quality Control Requirements and Performance Standards for Selected Analytical Protocols* (WSC-10-320).

Massachusetts Department of Environmental Protection (MassDEP). 2007. *MCP Representativeness Evaluations and Data Usability Assessments* (WSC-07-350).

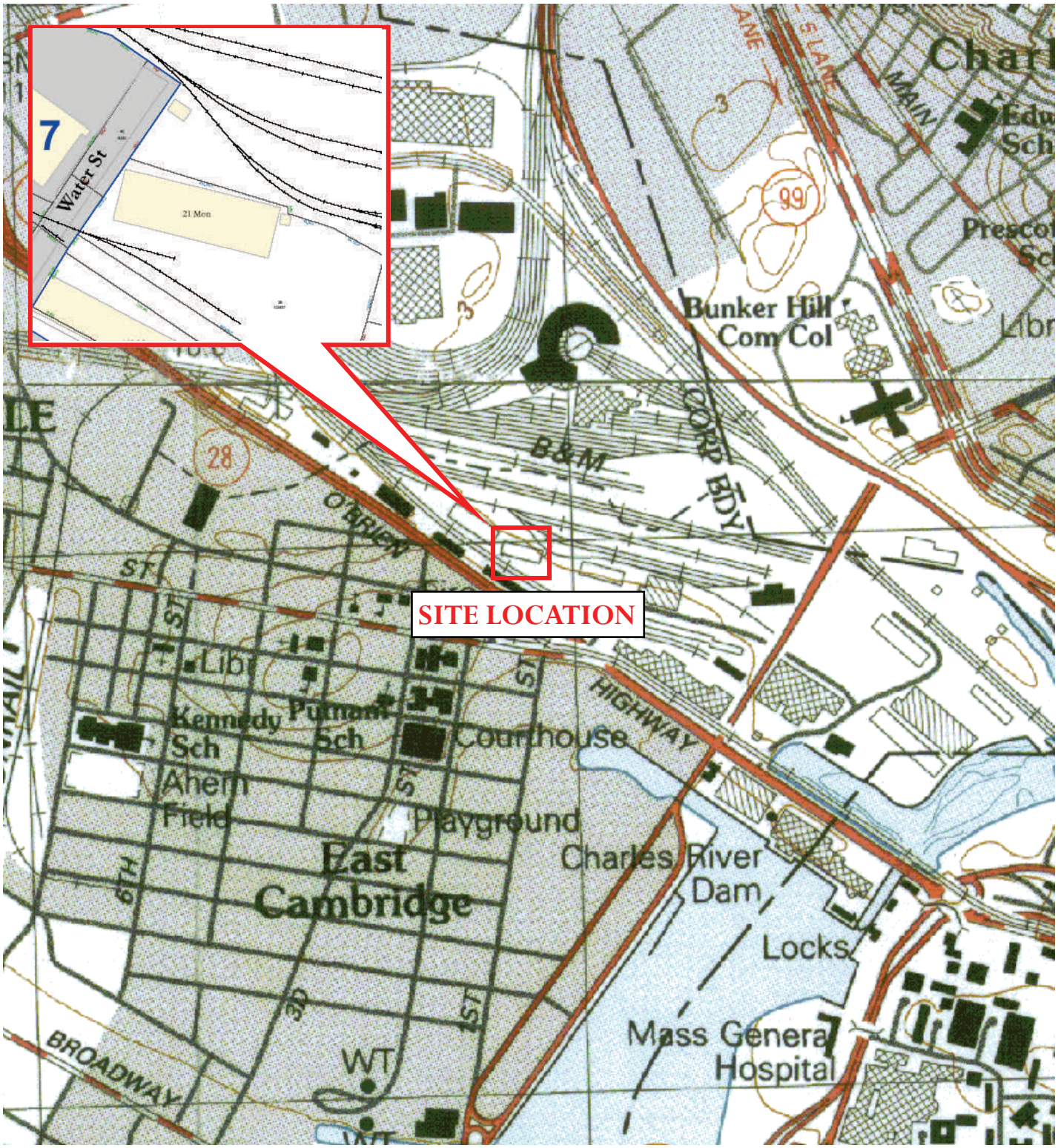


Figure 1-2: Site Location

MBTA Tire Maintenance Facility

21 Water Street, Cambridge, Massachusetts

NAA File P2814

Figure 2-1: CMU Sampling Groups

MBTA Tire Maintenance Facility
21 Water Street
Cambridge, Massachusetts
NAA File P2814

NOVER-ARMSTRONG ASSOCIATES, INC.

NOTES:
1. EACH SAMPLE WILL BE COLLECTED BY DRILLING 0-1" INTO THE EXTERIOR CONCRETE WALL SURFACE SURROUNDING THE WINDOW.

APPROXIMATE SAMPLING LOCATION

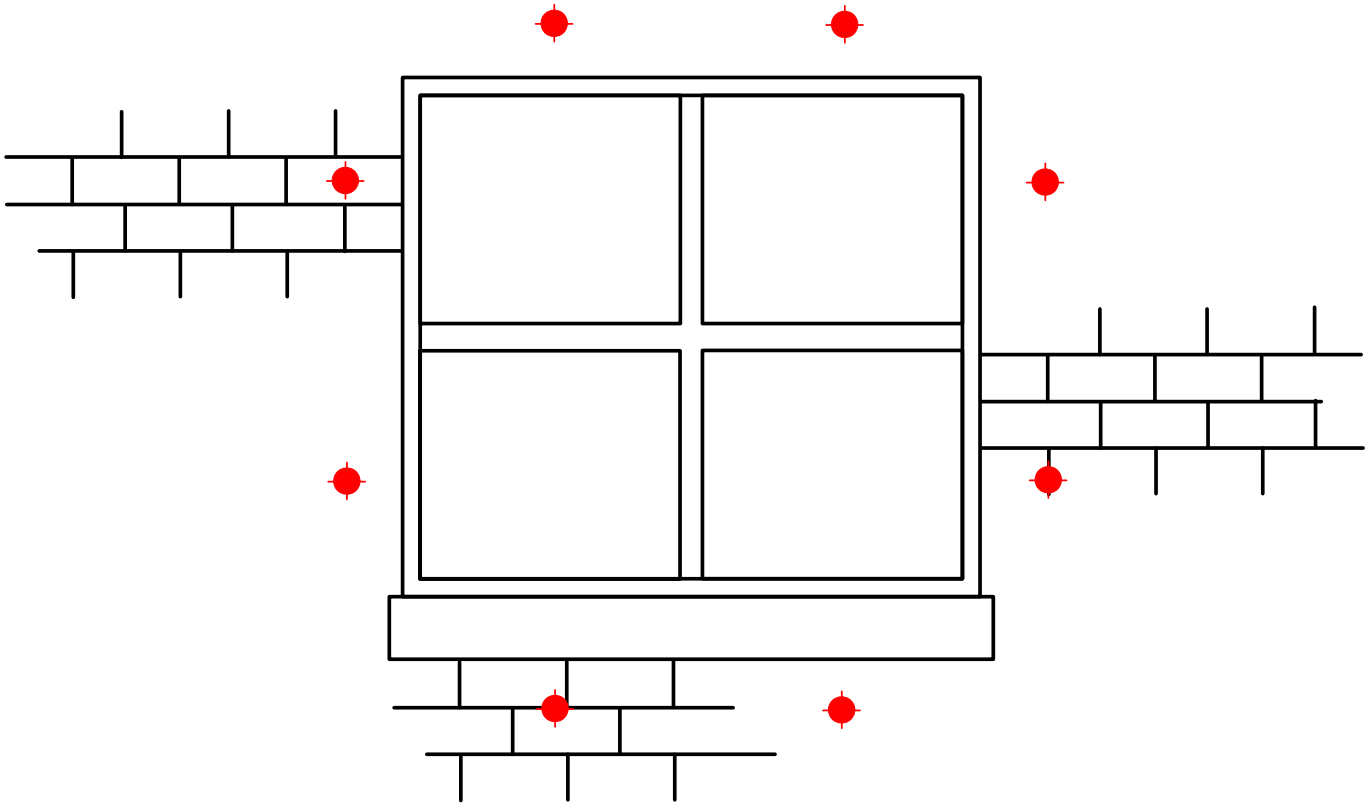
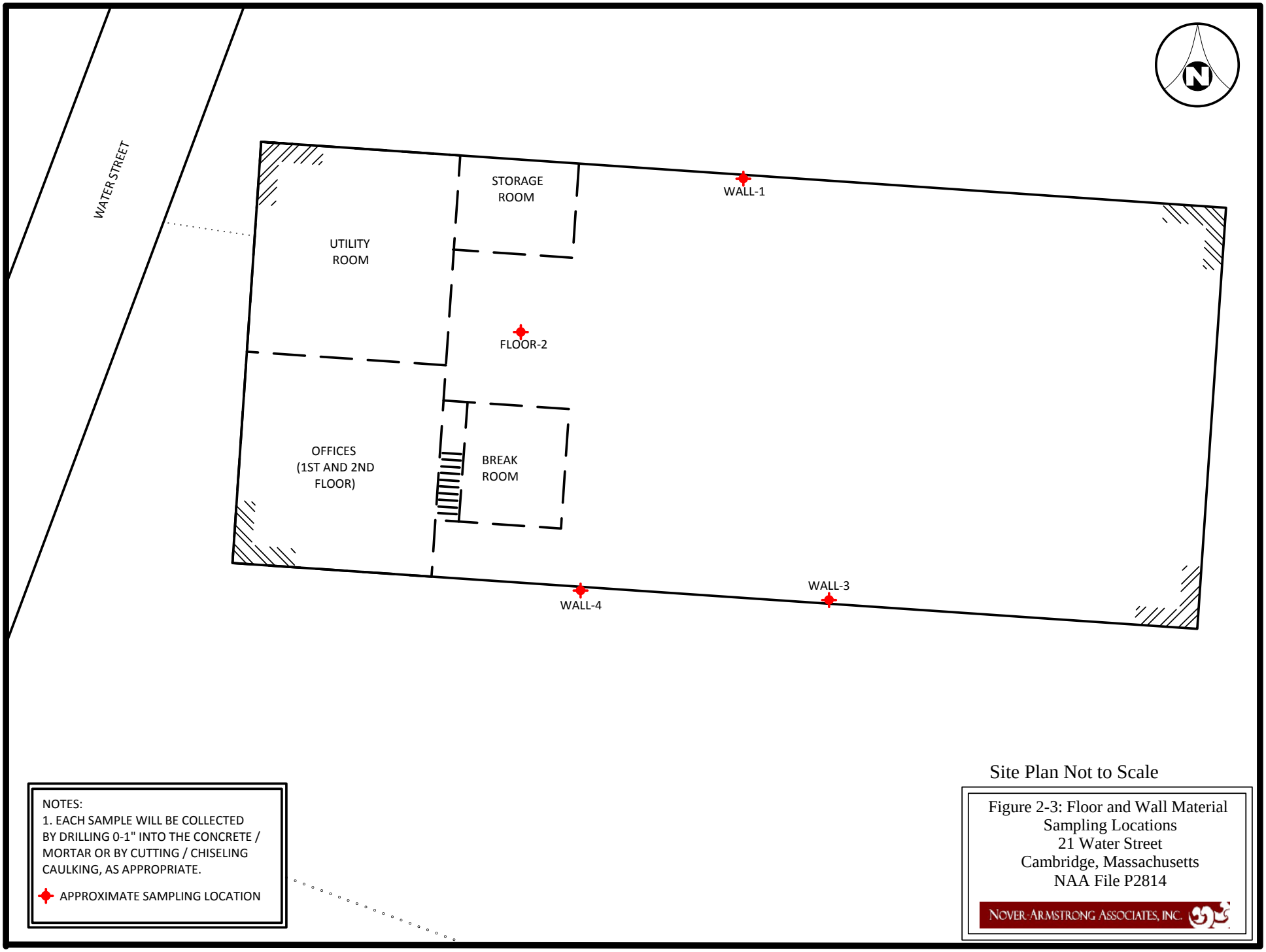


Figure 2-2: Individual Window Sampling Scheme
21 Water Street
Cambridge, Massachusetts
NAA File P2814

NOVER-ARMSTRONG ASSOCIATES, INC.

Site Plan Not to Scale


WATER STREET
STORAGE ROOM
WALL-1
UTILITY ROOM
FLOOR-2
OFFICES (1ST AND 2ND FLOOR)
BREAK ROOM
WALL-4
WALL-3
NOTES:
1. EACH SAMPLE WILL BE COLLECTED BY DRILLING 0-1" INTO THE CONCRETE / MORTAR OR BY CUTTING / CHISELING CAULKING, AS APPROPRIATE.
APPROXIMATE SAMPLING LOCATION
Site Plan Not to Scale
Figure 2-3: Floor and Wall Material Sampling Locations
21 Water Street
Cambridge, Massachusetts
NAA File P2814
NOVER-ARMSTRONG ASSOCIATES, INC.

APPENDIX A

SITE-SPECIFIC STANDARD OPERATING PROCEDURES (SOPs)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

STANDARD OPERATING PROCEDURE FOR SAMPLING POROUS SURFACES FOR POLYCHLORINATED BIPHENYLS (PCBs)

May 2011

SDMS DocID 484692

STANDARD OPERATING PROCEDURE FOR SAMPLING POROUS SURFACES FOR POLYCHLORINATED BIPHENYLS (PCBs)

The Office of Environmental Measurement and Evaluation
EPA New England – Region 1
11 Technology Dr.
North Chelmsford, MA 01863

Prepared by: Dan Granz, Environmental Engineer — Date: 5/5/11

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Reviewed by: Jerry Keefe – EIA Team Leader — Date: 05/23/11

Approved by: Dan Boudreau, EIA Chemistry Team Leader — Date: 5/23/11

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Revision Page

Date	Rev#	Summary of Changes	Sections
12/97	1	Initial Approval, draft	
3/20/08	2	Major update, only for PCBs, added TSCA sampling	All sections
7/17/08	3	Disposal of dust filter and decon of vac hose	11.0 and 14.0
5/04/11	4	Vacuum Trap Design and Clean-out	9.4

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11.0 Decontamination 11

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13.0 Quality Control and Quality Assurance 11

14.0 Waste Management and Pollution Prevention 12

15.0 References 12

Attachments:

Example of Custody Seal and Sample Label
Example of Chain of Custody Form

1.0 Scope and Application

1.1 This Standard Operating Procedure (SOP) is suitable for collection of a porous matrix sample for analysis of Polychlorinated Biphenyls (PCBs).

1.2 This SOP describes sampling techniques for both hard and soft porous surfaces.

1.2.1 Hard surfaces, and most soft surfaces, can be sampled using an impact hammer drill to generate a uniform, finely ground, powder to be extracted and analyzed for PCBs. This procedure is primarily geared at providing enough sample quantity for two analyses. Hard porous surfaces include concrete, brick, asphalt, cement, sandstone, limestone, unglazed ceramics, and other possible PCB suspected material. This procedure may also be used on other softer porous surfaces, such as wood.

1.2.2 Soft surfaces can be sampled using a chisel or sharp knife to generate a representative sample to be extracted and analyzed for PCBs. Soft porous surfaces include wood, wall plasterboard, low density plastics, rubber, caulking, and other PCB suspected material.

1.3 This SOP provides for collection of surface samples (0 – 0.5 inches) and delineation of PCB contamination throughout the core of the porous surface. The procedure can be used to sample the porous surface at distinctly different depth zones.

2.0 Method Summary

A one-inch or other sized diameter carbide drill bit is used in a rotary impact hammer drill to generate a fine powder, or other representative sample, suitable for extraction and analysis of PCBs from porous surfaces. This method also allows the use of chisels or knives for the collection of samples from soft porous surfaces for PCB analysis.

3.0 Definitions

3.1 Field/Bottle Blank: A sample container of the same lot as the containers used for the environmental samples. This evaluates PCB contamination introduced from the sample container(s) from a common lot.

3.2 Equipment/Rinse/Rinsate Blanks: A sample that is collected by pouring hexane over the sample collection equipment after decontamination and before sample collection. The sample is collected in the appropriate sample container identical to the sample containers. This represents background contamination resulting from the field equipment, sampling procedure, sample container, and shipment.

3.3 Field Replicates/Duplicates: Two or more samples collected at the same sampling location. Field replicates should be samples collected side by side. Field replicates represent the precision of the whole method, site heterogeneity, field sampling, and the laboratory analysis.

3.4 Field Split Samples: Two or more representative subsamples taken from one environmental sample in the field. Prior to splitting, the environmental sample is homogenized to correct for sample heterogeneity that would adversely impact data comparability. Field split samples are usually analyzed by different laboratories (interlaboratory comparison) or by the same laboratory (intralaboratory comparison). Field splits are used to assess sample handling procedures from field to laboratory and laboratory comparability.

3.5 Laboratory Quality Samples: Additional samples that will be collected for the laboratory's quality control program: matrix spike, matrix spike duplicate, laboratory duplicates, etc.

3.6 Proficiency Testing (PT)/Performance Evaluation (PE) Sample: A sample, the composition of which is unknown to the laboratory or analyst, provided to the analyst or laboratory to assess the capability to produce results within acceptable criteria. This is optional depending on the data quality objectives. If possible, it is recommended that the PE sample be of similar matrix as the porous surface(s) being sampled.

3.7 Porous Surface: Any surface that allows PCBs to penetrate or pass into itself including, but not limited to, paint or coating on metal; corroded metal; fibrous glass or glass wool; unglazed ceramics; ceramics with porous glaze; porous building stone such as sandstone, travertine, limestone, or coral rock; low density plastics such as Styrofoam and low density polyethylene; coated (varnished or painted) or uncoated wood; painted or unpainted concrete or cement; plaster; plasterboard; wallboard; rubber; caulking; fiberboard; chipboard; asphalt; or tar paper.

3.8 Shipping Container Temperature Blank: A water sample that is transported to the laboratory to measure the temperature of the samples in the cooler.

4.0 Health and Safety

4.1 Eye, respiratory, and hearing protection are required at all times during sample drilling. A properly fitted respirator is required for hard porous surface sampling. A respirator is recommended whenever there is a risk of inhalation of either particulate or volatilized PCBs during sampling.

4.2 All proper personal protection clothing and equipment must be worn.

4.3 When working with potentially hazardous materials or situations, follow EPA, OSHA, and specific health or safety procedures.

4.4 Care must be exercised when using an electrical drill and sharp cutting objects.

5.0 Interferences and Potential Problems

5.1 This sampling technique produces a finely ground uniform powder, which minimizes the physical matrix effects from variations in the sample consistency (i.e., particle size, uniformity, homogeneity, and surface condition). Matrix spike analysis of a sample is highly recommended to monitor for any matrix related interferences.

5.2 Nitrile gloves are recommended. Latex gloves must not be used due to possible phthalate contamination.

5.3 Interferences may result from using contaminated equipment, solvents, reagents, sample containers, or sampling in a disturbed area. The drill bit must be decontaminated between samples. (see Section 11.0.)

5.4 Cross contamination problems can be eliminated or minimized through the use of dedicated sampling equipment.

6.0 Personnel Qualifications

6.1 All field samplers working at hazardous materials/waste sites are required to take a 40 hour health and safety training course prior to engaging in any field activities. Subsequently, an 8 hour refresher health and safety course is required annually.

6.2 The field sampler should be trained by an experienced sampler before initiating this procedure.

6.3 All personnel shall be responsible for complying with all quality assurance/quality control requirements that pertain to their organizational/technical function.

7.0 Equipment and Supplies

7.1 This list varies with the matrix and if depth profiling is required

Rotary impact hammer variable speed drill
1-inch or other suitable (1/2, 3/4, etc.) diameter carbide tip drill bits
Steel chisel or sharp cutting knife, and hammer
Brush and cloths to clean area
Stainless steel scoopulas

Aluminum foil to collect the powder sample
1 quart Cubitainer with the top cut out to collect the powder sample
Aluminum weighing pans to collect the powder sample
Cleaned glass container (2 oz or 40 mL) with Teflon lined cap
Decontamination supplies: hexane, two small buckets, a scrub brush, detergent, deionized water, hexane squirt bottle, and paper towels
Dedicated vacuum cleaner with a disposable filter or a vacuum pump with a dust filter
Polyethylene tubing and Pasteur pipettes
Sample tags/labels, custody seals, and Chain-of-Custody form

8.0 Sampling Design

8.1 A sufficient number of samples must be collected to meet the data quality objectives of the project. If the source of the PCB contamination is regulated under the federal TSCA PCB Regulations at 40 CFR Part 761, the sampler should insure that the sampling design is sufficient to meet any investigation or verification sampling requirements. At a minimum, the following is recommended:

8.1.1 Suspected stained area (s) should be sampled.

8.1.2 At each separate location, collect at least 3 samples of each type of porous surface, regardless of the amount of each type of porous surface present.

8.1.3 In areas where PCB equipment was used or where PCBs were stored, samples should be collected at a frequency of 1 sample/100 square feet (ft^2).

9.0 Sample Collection

9.1 Hard Porous Surfaces

9.1.1 Lock a 1-inch or another size diameter carbide drill bit into the impact hammer drill and plug the drill into an appropriate power source. For easy identification, sample locations may be pre-marked using a marker or paint. (Note: the actual drilling point must not be marked.) Remove any debris with a clean brush or cloth prior to drilling. All sampling decisions of this nature should be noted in the sampling logbook.

9.1.2 Use a Cubitainer with the top cut off or aluminum foil to contain the powdered sample. Begin drilling in the designated location. Apply steady even pressure and let the drill do the work. Applying too much pressure will generate excessive heat and dull the drill bit prematurely. The drill will provide a finely ground powder that can be easily collected.

9.1.3 Samples should be collected at ½-inch depth intervals. Thus, the initial surface sample should be collected from 0 – 0.5 inches. A ½-inch deep hole generates about 10 grams (20 mL) of powder. Multiple holes located closely adjacent to each other, may be needed to generate sufficient sample volumes for a PCB determination. It is strongly recommended that the analytical laboratory be consulted on the minimum sample size needed for PCB extraction and analysis.

9.1.4 Wall and Ceiling Sampling: A team of two samplers will be required for wall and ceiling sampling. The second person will hold a clean catch surface (e.g. an aluminum pan) below the drill to collect the falling powder. Alternatively, use the chuck-end of the drill bit and punch a hole through the center of the collection pan. The drill bit is then mounted through the pan and into the drill. For ceilings, the drill may be held at an angle to collect the powder. Thus the driller can be drilling at an angle while the assistant steadies the pan to catch the falling powder. As a precaution, it may be advantageous to tape a piece of plastic around the drill, just below the chuck, to avoid dust contaminating the body of the drill and entering the drill's cooling vents. Caution must be taken to prevent obstruction of the drill's cooling vents.

9.2 Soft Porous Surfaces

9.2.1 The procedure for the hard porous surface may be used for certain soft porous surfaces, such as wood.

9.2.2 Samples should be collected at no more than ½-inch depth intervals using a metal chisel or sharp cutting knife. Thus, the initial surface sample should be collected from 0 – 0.5 inches. It is important to collect at least 10 grams for analysis.

9.2.3 For soft porous surfaces, such as caulking and rubber, a representative sample can be collected using a metal chisel or sharp cutting knife.

9.3 Multiple Depth Sampling

9.3.1 Multiple Depth Sampling may not be applicable to certain porous surfaces, such as caulking.

9.3.2 Collect the surface sample as outlined in Section 9.1 or 9.2.

9.3.3 Use the vacuum pump or cleaner to clean out the hole.

9.3.4 To collect multiple depths there are two options.

9.3.4.1 Option one: drill sequentially ½-inch increments with the 1 inch drill.

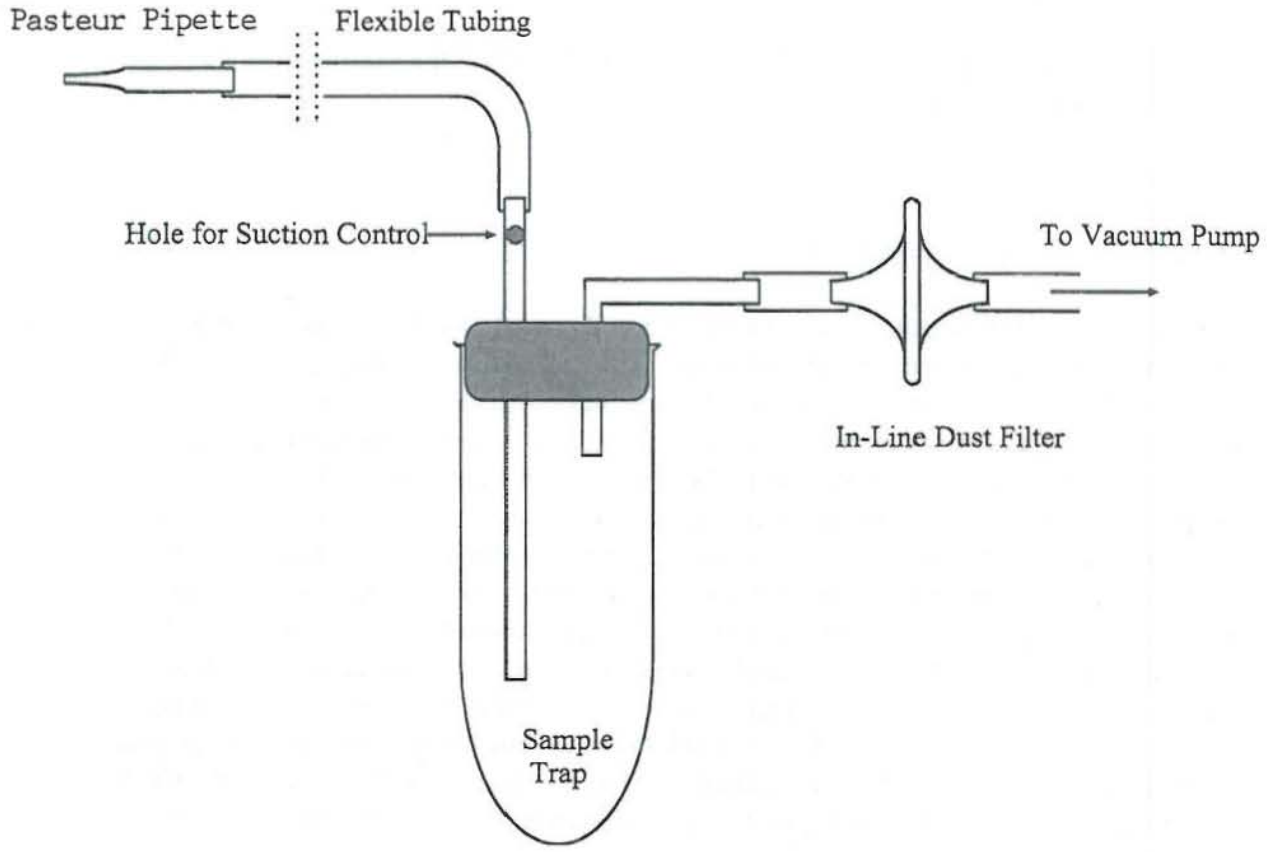
9.3.4.2 Option two: drill with the 1 inch bit and either make the hole larger or use a smaller bit to take the next ½- inch sample.

9.3.5 A stainless steel scoopula will make it easier to collect the sample from the bottom of the hole.

9.4 Vacuum Trap Design and Clean-out

The trap presented in Figure 1 is a convenient and thorough way for collecting and removing concrete powder from drilled holes. The trap system is designed to allow for control of the suction from the vacuum pump and easy trap clean-out between samples. Note, by placing a hole in the inlet tube (see Figure 1), a finger on the hand holding the trap can be used to control the suction at the sampling tip. Thus, when this hole is left completely open, there will be no suction, and the sampler can have complete control over where and what to sample. To change-out between samples the following steps should be taken: 1) the Pasteur pipette and piece of polyethylene tubing at the sample inlet should be replaced with new materials, 2) the portion of the rubber stopper and glass tubing that was in the trap should be wiped down with a clean damp paper towel (wetted with deionized water) and then dried with a fresh paper towel, 3) a clean pipe cleaner should be drawn through the glass inlet tube to remove any concrete dust present, and 4) the glass tube or flask used to collect the sample should swapped out with a clean decontaminated sample trap. Having several clean tubes or flasks on hand will facilitate change-out between samples.

Figure 1



Note: the holes should be vacuumed thoroughly to minimize any cross-contamination between sample depths and the bits should be decontaminated between samples. (See Section 11.0)

10.0 Sample Handling, Preservation, and Storage

10.1 Samples must be collected in glass containers for PCB analyses. In general, a 2-ounce sample container with a Teflon-lined cap (wide-mouth jars are preferred) will hold sufficient mass for most analyses. A 2-ounce jar can hold roughly 90 grams of sample.

10.2 Samples are to be shipped refrigerated and maintained at $\leq$ 6°C until the time of extraction and analysis.

10.3 The suggested holding time for PCB samples is 14 days to extraction.

11.0 Decontamination

11.1 Assemble two decontamination buckets. The first bucket contains a detergent and potable water solution, and the second bucket is for rinsate. Place all used drill bits, hose for the vacuum cleaner, and utensils in the detergent and water bucket. Scrub each piece thoroughly using the scrub brush. Note, the powder does cling to the metal surfaces, so care should be taken during this step, especially with the twists and curves of the drill bits. Next, rinse each piece with water and hexane. Place the rinsed pieces on clean paper towels and individually dry and inspect each piece. Note: all pieces should be dry prior to reuse.

11.2 Lightly contaminated drill bits and utensils may be wiped with a hexane soaked cloth and hexane rinsed for decontamination.

12.0 Data and Record Management

12.1 All data and information collection should follow a Field Data Management SOP or Quality Assurance Project Plan (QAPP).

12.2 Follow the chain of custody procedures to release the samples to the laboratory. A copy is kept with the sampling records.

12.3 The field data is stored for at least 3 years.

13.0 Quality Control and Quality Assurance

13.1 Representative samples are required. The sampler will evaluate the site specific conditions to assure the sample will be representative.

13.2 All sampling equipment must be decontaminated prior to use and between each discrete sample.

13.3 All field Quality Control (QC) sample requirements in a Sample and Analysis Plan (SAP) or QAPP must be followed. The SAP or QAPP may involve field blanks, equipment blanks, field duplicates and/or the collection of extra samples for the laboratory's quality control program.

13.4 Field duplicates should be collected at a minimum frequency of 1 per 20 samples or 1 per non-related porous matrix, whichever is greater.

14.0 Waste Management and Pollution Prevention

14.1 During field sampling events there may be PCB and/or hazardous waste produced from the sample collection. The waste must be handled and disposed of in accordance with federal, state, and local regulations. The dust filter, and tubing if a vacuum pump is used, is disposed after each site investigation. This waste will be treated as PCB waste if the samples are positive for PCBs. It may be possible to manage or dispose of the waste produced at the site where the work was performed. If the site does not meet regulatory requirements for these types of activities, the waste must be transported to a facility permitted to manage and/or dispose of the waste.

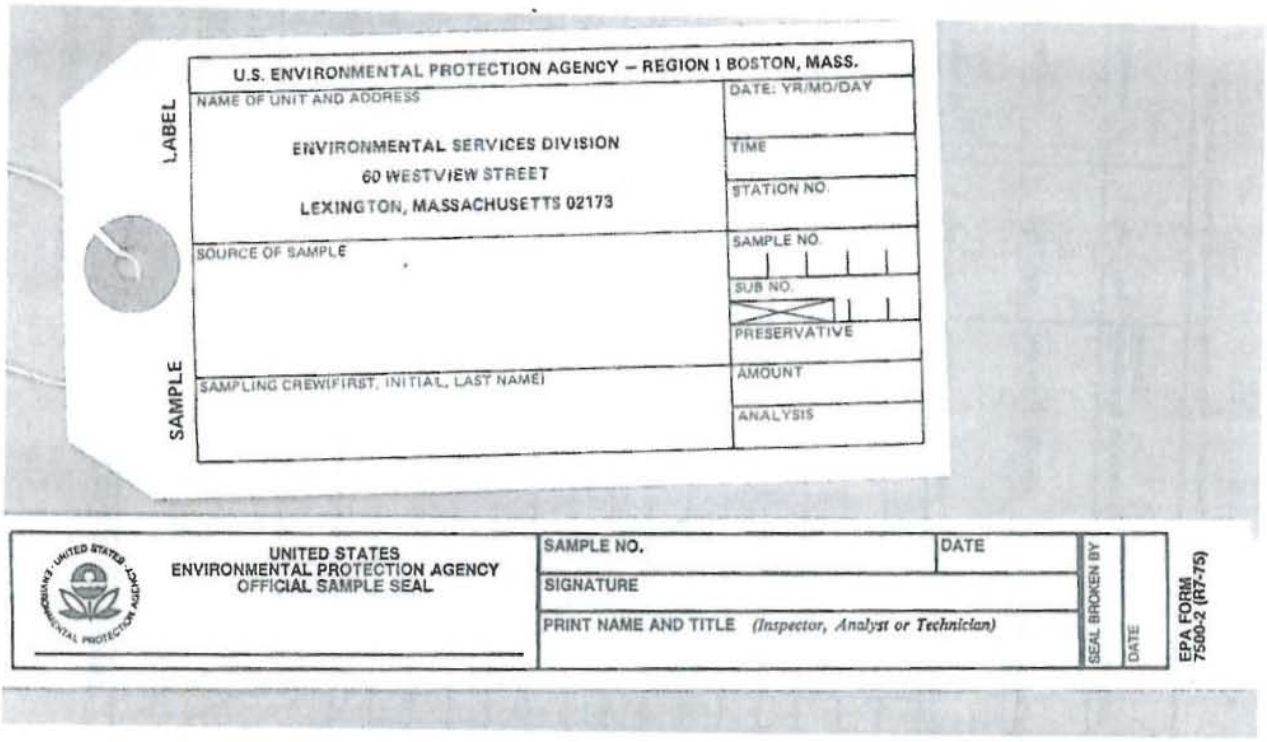
15.0 References

1. Guidance for the Preparation of Standard Operating Procedures for Quality-Related Operations, QA/G-6, EPA/600/R-96/027, November 1995.

2. 40 CFR Part 761 – Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution In Commerce, and Use Prohibitions

3. Sample Container and Holding Time: RCRA SW 846, Chapter 4, Table 4.1, Revision 4, February, 2007.

Example of Sample Label and Custody Seal



U.S. ENVIRONMENTAL PROTECTION AGENCY – REGION I BOSTON, MASS.

LABEL

NAME OF UNIT AND ADDRESS

ENVIRONMENTAL SERVICES DIVISION
60 WESTVIEW STREET
LEXINGTON, MASSACHUSETTS 02173

DATE: YR/MO/DAY

TIME

STATION NO.

SAMPLE

SOURCE OF SAMPLE

SAMPLE NO.

SUB NO.

PRESERVATIVE

SAMPLING CREW(FIRST, INITIAL, LAST NAME)

AMOUNT

ANALYSIS

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SAMPLE SEAL

SAMPLE NO.

DATE

SIGNATURE

PRINT NAME AND TITLE *(Inspector, Analyst or Technician)*

SEAL BROKEN BY

DATE

EPA FORM
7500-2 (R7-75)

Example of Chain of Custody Form

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME	NO. OF CON-TAINERS							REMARKS
SAMPLERS: *(Signature)*									
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION				

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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Equipment Decontamination

Standard Operating Procedure SOP.NAA_C.05.1

July 2011

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A. PURPOSE AND APPLICABILITY

The purpose of this Standard Operating Procedure (SOP) is to establish a uniform procedure for the decontamination of sampling equipment when the use of single use disposable equipment is not possible. The procedures outlined in this SOP are applicable to all Nover-Armstrong Associates, Inc. (Nover-Armstrong) field personnel who decontaminate reusable equipment prior to use in the field.

B. SUMMARY OF METHOD

Equipment is cleaned and decontaminated before its use in every different location. Appropriate methods, determined by the function of the equipment and what compounds the equipment is used to measure, are observed.

C. DEFINITIONS

VOC	Volatile Organic Compound
SVOC	Semi-Volatile Organic Compound
PCB	Polychlorinated Biphenyl
VOA	Volatile Organic Analysis
MCP	Massachusetts Contingency Plan (310 CMR 40.0000)
OSHA	Occupational Health and Safety Administration
HAZWOPER	Hazardous Waste Operations and Emergency Response
TPH	Total Petroleum Hydrocarbon
MeOH	Methanol

D. HEALTH AND SAFETY WARNINGS

Field sampling personnel should use caution when handling soil samples with potentially elevated concentrations of hazardous chemical compounds. The sampler should wear protective gloves and safety glasses to avoid direct contact with the soil. The sampler should also wear clothing and protective gear that is appropriate for the type of site, field conditions, and weather conditions in which they are collecting the soil samples. Gloves and other articles of clothing that come in contact with potentially contaminated soil should be cleaned or disposed of after each sampling event. Food and drink should not be brought onto sites at which elevated concentrations of hazardous materials are potentially present. Laboratory containers containing corrosive, caustic, and/or toxic chemical preservatives must be handled with care.

E. CAUTIONS

It is important to note the source of rinse water, for it is often from nearby public sources. The source should be noted and a sample collected.

F. INTERFERENCES

Avoid using distilled water stored in plastic bottles for the plastic contains too many contaminants. Bring deionized water in either nalgene bottles or teflon bottles if possible.

G. PERSONNEL QUALIFICATIONS

Field sampling personnel using this SOP should have completed OSHA's 40-hour HAZWOPER training and annual 8-hour refresher training.

H. EQUIPMENT AND SUPPLIES

The following equipment and supplies are required for this SOP:

- Plastic gloves
- Safety glasses
- Garbage bag for disposal of used field supplies
- Non-phosphate detergent-solution (e.g. Alconox)
- Brush
- Tap water
- Deionized water (either ASTM type I or II)
- Decontamination of metals analysis equipment additionally requires:
    - 1:1 nitric acid
- Decontamination of SVOC collection equipment additionally requires:
    - Technical grade acetone
    - Pesticide grade hexane
- Decontamination of VOC collection equipment OR of oil or grease analysis equipment additionally requires:
    - Reagent grade methanol (MeOH)

I. PROCEDURE[1]

1. Equipment to be utilized in the collection of samples for metals analysis should be cleaned by the following steps:
    a. Wash equipment with a non-phosphate detergent-solution and a brush.
    b. Rinse thoroughly with tap water.
    c. Rinse with 1:1 nitric acid.
    d. Rinse the equipment thoroughly with deionized water.
    e. For water samples, rinse the equipment two to three times with the media being sampled before collecting a sample.
    f. Repeat this procedure at each location.

2. Equipment to be used for collection of samples for oil identification, oil and grease analyses, and TPH should be cleaned by the following steps:
    a. Wash equipment with a non-phosphate detergent-solution and a brush.
    b. Rinse with tap water.
    c. Rinse with reagent grade MeOH
    d. Rinse thoroughly with deionized water.
    e. For water samples, rinse the equipment two to three times with the media being sampled prior to collecting a sample.

[1] Nover-Armstrong's Standard Operating Procedure (SOP) for decontamination of sampling equipment follows the procedures described in MassDEP Policy WSC-91-310 *Standard References for Monitoring Wells.*

f. Repeat at each location.

3. Equipment to be used for collection of SVOCs (including base-neutral extractables, PCBs, herbicides, and pesticides) should be cleaned by the following steps:
   a. Wash equipment with a non-phosphate detergent-solution and a brush
   b. Rinse with tap water.
   c. Rinse with technical grade acetone.
   d. Rinse with pesticide grade hexane.
   e. Rinse thoroughly with deionized water.
   f. For water samples, rinse the equipment two to three times with the media being sampled prior to collecting a sample.
   g. Repeat at each location.

4. Equipment used for collection of samples for VOA should be cleaned by the following steps:
   a. Wash equipment with a non-phosphate detergent solution and a brush.
   b. Rinse with tap water.
   c. Rinse with reagent grade MeOH.
   d. Rinse thoroughly with deionized water.
   e. For water samples, rinse the equipment two to three times with the media being sampled prior to collecting a sample.
   f. Repeat at each location.

5. Steam Cleaning is another acceptable technique for field decontamination.

J. DATA AND RECORDS MANAGEMENT

Hard copies of recorded field sampling notes will be kept in individual project folders at the Nover-Armstrong office location in Carver, MA. Additionally, the field sampling notes will be scanned and stored electronically on the company's computer system. Laboratory analytical results will be received as electronic .pdf files and stored electronically on Nover-Armstrong's computer system. Archived files of analytical results are also maintained by the analytical laboratories.

K. QUALITY CONTROL AND QUALITY ASSURANCE

Instrumentation shall be checked intermittently by the Project Manager to ensure that the proper procedures for equipment decontamination are being followed at all project sites.

L. REFERENCES

1. United States Environmental Protection Agency (USEPA). 2007. *Guidance for Preparing Standard Operating Procedures (SOPs)* (EPA QA/G-6).

2. United States Environmental Protection Agency (USEPA) Region 1. 2010. *Quality Assurance Project Plan Program Guidance*.

3. MassDEP Policy WSC-91-310 *Standard References for Monitoring Wells*

4. SOP.NAA_C.01.1 Field Documentation

Chain of Custody Sample Handling & Shipping

Standard Operating Procedure SOP.NAA_C.07.1

July 2011

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A. PURPOSE AND APPLICABILITY

The purpose of this Standard Operating Procedure (SOP) is to establish a uniform procedure for documenting the chain of custody associated with any field sample to ensure that the sample is accounted for at all times. The procedures outlined in this SOP are applicable to all Nover-Armstrong Associates, Inc. (Nover-Armstrong) field personnel who collect or handle field samples.

B. SUMMARY OF METHOD

Chain of custody records are created and maintained in order to document the identity of a sample and its handling from its creation as a sample until analysis and data reduction are completed.

C. DEFINITIONS

COC	Chain of Custody
MCP	Massachusetts Contingency Plan (310 CMR 40.0000)
OSHA	Occupational Health and Safety Administration
HAZWOPER	Hazardous Waste Operations and Emergency Response
VOC	Volatile Organic Compound

D. HEALTH AND SAFETY WARNINGS

Field sampling personnel should use caution when handling soil samples with potentially elevated concentrations of hazardous chemical compounds. The sampler should wear protective gloves and safety glasses to avoid direct contact with the soil. The sampler should also wear clothing and protective gear that is appropriate for the type of site, field conditions, and weather conditions in which they are collecting the soil samples. Gloves and other articles of clothing that come in contact with potentially contaminated soil should be cleaned or disposed of after each sampling event. Food and drink should not be brought onto sites at which elevated concentrations of hazardous materials are potentially present. Laboratory containers containing corrosive, caustic, and/or toxic chemical preservatives must be handled with care.

E. CAUTIONS

Care must be taken to uniquely identify all samples, samples are protected from loss or damage, any processing of samples is documented, and client confidentiality is maintained. A sample is considered to be under a chain of custody if it is in your custody, it is in your view after being in your possession, it is in your possession and locked up to prevent tampering, and it is in a designated, secured area.

F. INTERFERENCES

Avoid leaving samples unattended, unlocked, or in locations where they could be tampered with or vandalized.

G. PERSONNEL QUALIFICATIONS

Field sampling personnel using this SOP should have completed OSHA’s 40-hour HAZWOPER training and annual 8-hour refresher training.

H. EQUIPMENT AND SUPPLIES

The following equipment and supplies are required for this SOP:

- Plastic gloves
- Safety glasses
- Chain of Custody form
- Chain of Custody records
- Field data sheets
- Sample labels
- Pen or marker for labels
- Field book for notes

I. PROCEDURE[1]

1. Pre-prepare labels for each sample that includes identification, date and time of collection, sample parameters to be analyzed, any preservatives added, and the name of the sample collector.

2. Record the procedures and amounts of reagents or supplies necessary for each sample including sample preparation and preservation.

3. Record date and time of sampling, sampling locations, sample bottle identification, and specific sample acquisition measures on the chain of custody forms.

4. The COC description section requires:
    a. A unique identification of each sample
    b. The name(s), address(es), and telephone number(s) of the sampler(s) and the person shipping the samples and all subsequent transfers of custody
    c. The type and method of analysis requested (sometimes this can be put on the field data sheet that accompanies the COC form)
    d. The date and time that the samples were taken and delivered for shipping
    e. The names of those responsible for receiving the samples at the laboratory

5. Complete standard field data record forms to establish sample custody in the field before sample shipment.

6. At least four copies of the COC record are needed:
    a. The original COC record and one copy are sent to the laboratory with the samples
    b. One copy is retained by the sampling crew chief
    c. One copy is placed in the project file
7. The signed copy of the original COC record is retained by the laboratory, but copies of the original record, signed by the receiving laboratory are returned to the sampling crew chief and to the project file.

---

[1] Nover-Armstrong's Standard Operating Procedure (SOP) for chain of custody documentation follows the procedures described in MassDEP Policy WSC-91-310 *Standard References for Monitoring Wells.*

J. DATA AND RECORDS MANAGEMENT

Hard copies of COCs will be kept in individual project folders at the Nover-Armstrong office location in Carver, MA. Additionally, the COCs will be scanned and stored electronically on the company's computer system. Laboratory analytical results will be received as electronic .pdf files and stored electronically on Nover-Armstrong's computer system. Archived files of analytical results are also maintained by the analytical laboratories.

K. QUALITY CONTROL AND QUALITY ASSURANCE

Chains of Custody will be reviewed by the Project Manager to ensure proper documentation procedures. Nover-Armstrong field personnel will be trained to properly complete COCs prior to using them in the field. Special instructions on COCs will be verbally conveyed to laboratory personnel to ensure that the proper instructions are being followed.

L. REFERENCES

1. United States Environmental Protection Agency (USEPA). 2007. *Guidance for Preparing Standard Operating Procedures (SOPs)* (EPA QA/G-6).

2. United States Environmental Protection Agency (USEPA) Region 1. 2010. *Quality Assurance Project Plan Program Guidance*.

3. MassDEP Policy WSC-91-310 *Standard References for Monitoring Wells*

4. SOP.NAA_C.01.1 Field Documentation

Field Documentation

Standard Operating Procedure SOP.NAA_C.01.1

July 2011

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L. REFERENCES 6

A. PURPOSE AND APPLICABILITY

The purpose of this Standard Operating Procedure (SOP) is to establish a uniform procedure for documenting samples collected for analysis. The procedures outlined in this SOP are applicable to all Nover-Armstrong Associates, Inc. (Nover-Armstrong) field personnel who collect samples for laboratory analysis at MCP and non-MCP project sites.

B. SUMMARY OF METHOD

Collected samples are documented to uniquely identify each sample and ensure adequate chain-of-custody procedures.

C. DEFINITIONS

VOC	Volatile Organic Compound
MCP	Massachusetts Contingency Plan (310 CMR 40.0000)
OSHA	Occupational Health and Safety Administration
HAZWOPER	Hazardous Waste Operations and Emergency Response

D. HEALTH AND SAFETY WARNINGS

Field sampling personnel should use caution when handling soil samples with potentially elevated concentrations of hazardous chemical compounds. The sampler should wear protective gloves and safety glasses to avoid direct contact with the soil. The sampler should also wear clothing and protective gear that is appropriate for the type of site, field conditions, and weather conditions in which they are collecting the soil samples. Gloves and other articles of clothing that come in contact with potentially contaminated soil should be cleaned or disposed of after each sampling event. Food and drink should not be brought onto sites at which elevated concentrations of hazardous materials are potentially present. Laboratory containers containing corrosive, caustic, and/or toxic chemical preservatives must be handled with care.

E. CAUTIONS

Take care to note that any samples collected may be used in future litigations. Also take note that if taking samples from privately owned property, samplers should provide the property owner with a receipt for the samples collected.

F. INTERFERENCES

Avoid using multiple transportation carriers in sending samples to the laboratory to avoid confusion.

G. PERSONNEL QUALIFICATIONS

Field sampling personnel using this SOP should have completed OSHA's 40-hour HAZWOPER training and annual 8-hour refresher training.

H. EQUIPMENT AND SUPPLIES

The following equipment and supplies are required for this SOP:

- Plastic gloves
- Safety glasses
- Chain of Custody form
- Sample labels
- Pen or marker for labels
- Field book for notes
- Garbage bag for disposal of used field supplies

I. PROCEDURE

1. Review project plans to determine what types of documentation must be completed for a sampling project and to ensure that the appropriate documentation will be on-hand in the field.

2. Field personnel shall use field logbooks and/or pre-printed work sheets to accurately document all field activities: on-site conditions; field measurements; sample collection information; field instrument and calibration information; and other pertinent site-related information during monitoring activities.

3. The field notes shall include a description of field conditions that includes, as a minimum:

    - Site location
    - Date, start, and finish times of the work and weather conditions;
    - Name and initials of person making entry;
    - Names of other personnel present, if any;
    - Names of visitors, if any;
    - Purpose and summary of proposed work effort;
    - Details of any deviation from the field operations plan or standard operating procedures, including who authorized the deviation;
    - Field observations;
    - Sampling equipment used (including make model and serial number) and equipment calibration documentation;
    - Field screening methods, if used, and a description of screening locations;
    - Field screening results, and identify samples with both field and fixed lab analyses;
    - Fixed laboratory sample identification number, sample type (composite, grab), time of sampling, sample analysis, and sample locations shown on a near-scale map relative to a fixed landmark;
    - Sample handling, packaging, labeling, and shipping information (including destination);
    - Location, description and unique identifier for all photographs taken in association with the field activity; and
    - Any other pertinent information

4. Information recorded in other site documents, *e.g.*, sampling logs, will not be repeated in logbooks except in summary form.

5. Any corrections to the logbook or other written documentation shall be initialed and dated. All corrections shall be shown as a single line through the original. The unused bottom portion of each page shall be lined-out, initialed, and dated.

J. DATA AND RECORDS MANAGEMENT

Hard copies of recorded field sampling notes will be kept in individual project folders at the Nover-Armstrong office location in Carver, MA. Additionally, the field sampling notes will be scanned and stored electronically on the company's computer system. Laboratory analytical results will be received as electronic .pdf files and stored electronically on Nover-Armstrong's computer system. Archived files of analytical results are also maintained by the analytical laboratories.

K. QUALITY CONTROL AND QUALITY ASSURANCE

Copies of field documentation will be reviewed by Project Managers upon completion of field activities to ensure the quality and correctness of the documentation. Any inconsistencies or questionable field notes will be reviewed together with field personnel to achieve clarity and reduce confusion. Nover-Armstrong field sampling personnel will be trained in the field documentation SOP prior to conducting field activities.

L. REFERENCES

1. United States Environmental Protection Agency (USEPA). 2007. *Guidance for Preparing Standard Operating Procedures (SOPs)* (EPA QA/G-6).

2. United States Environmental Protection Agency (USEPA) Region 1. 2010. *Quality Assurance Project Plan Program Guidance*.

3. US EPA *Sampler's Guide: Contract Laboratory Guidance for Field* Sampler s (July 2007). EPA 540-R-07-06.

PCBs

By Capillary Column Gas Chromatography

Reference Methods No.: **Method 8082**

Reference: SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, 1997.

1. Scope and Application

Method 8082 is used to determine the concentrations of Polychlorinated Biphenyls (PCBs) as Aroclors in extracts from solid and liquid matrices. This SOP details the analysis for PCBs using fused-silica, open-tubular, capillary columns with electron capture detectors (ECD).

Matrices: Extracts from solid and liquid matrices.

Definitions: See Alpha Laboratories Quality Manual Appendix A

Regulatory Parameter List: The standard compounds listed below are determined by this method.

Parameter	CAS
Aroclor 1016	12674-11-2
Aroclor 1221	11104-28-2
Aroclor 1232	11141-16-5
Aroclor 1242	53469-21-9
Aroclor 1248	12672-29-6
Aroclor 1254	11097-69-1
Aroclor 1260	11096-82-5
Aroclor 1262	37324-23-5
Aroclor 1268	11100-14-4

The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one of the following laboratory personnel before performing the modification: Area Supervisor, Laboratory Director, or Quality Assurance Officer.

This method is restricted to use by or under the supervision of analysts experienced in the operation of the gas chromatograph (GC) and in the interpretation of gas chromatograms. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability (see section 13.2), analyzing a proficiency test sample and completing the record of training.

After initial demonstration, ongoing demonstration is based on acceptable laboratory performance of at least a quarterly laboratory control sample or acceptable performance from an annual proficiency test sample. A major modification to this procedure requires demonstration of performance. The identification of major method modification requiring performance demonstration is directed by the QA Officer and/or Laboratory Director on a case-by-case basis.

2. Summary of Method

A measured volume or weight of sample (approximately 1L for liquids, 15g to 30g for solids) is extracted using the appropriate matrix-specific sample extraction technique.

Liquid samples are extracted at neutral pH with methylene chloride using Method 3510C (separatory funnel), or other appropriate technique.

Solid samples are extracted with methylene chloride: acetone (1:1) using Method 3540C (Soxhlet), or other appropriate technique. Solid samples may also be extracted with hexane:acetone (1:1) using Method 3546 (microwave).

Wipe samples are extracted with methylene chloride: acetone (1:1) using Method 3540C (Soxhlet) or other appropriate technique.

Oil samples are diluted with hexane following the procedure outlined in the extraction SOP.

Sulfuric acid cleanup (Method 3665) and Copper cleanup (Method 3660B) are utilized for PCB extracts.

After cleanup, the extract is analyzed by injecting 1µL into a gas chromatograph equipped with narrow- or wide-bore fused silica capillary columns and electron capture (GC/ECD) detectors.

2.1 Method Modifications from Reference

Internal standard calibration is used for all analytes. The internal standard used is 1-bromo-2-nitrobenzene.

3. Reporting Limits

Reporting limits vary depending on project specific data quality objectives.

4. Interferences

4.1 Instrumental

4.1.1 Only high purity gases are used in the GC system to eliminate this source of possible contamination. Both the helium (carrier gas – 99.999%) and argon-methane (detector make-up gas) are certified by the gas supplier.

4.1.2 Preventive instrument maintenance is performed routinely, and whenever highly contaminated extracts are analyzed that could result in chromatographic interferences or result in degradation of system performance. Section 9.5 details the maintenance steps.

4.1.3 Glassware must be scrupulously cleaned. This procedure is detailed in the Organic Extraction Cleaning and Handling SOP/02-03. Store dry glassware in a clean environment.

4.2 Parameters

4.2.1 All solvents used are pesticide grade or equivalent, and reagents are purchased as certified contaminant free. All of these materials are routinely determined to be free of interferences by analysis of extraction blanks with every extraction batch performed.

4.2.2 Certain compounds (i.e. phthalates) can be extracted from the sample matrix and be detected by the ECD that could possibly result in false positive results or complicate the data interpretation. The use of the cleanup procedure mentioned in Section 2.1 and detailed in the extraction SOP minimizes these possible interferences. Analyst experience is also crucial in making compound determinations.

4.2.3 Interferences co-extracted from the samples will vary considerably from waste to waste. While a general cleanup technique is referenced or provided as part of the method, unique samples may require additional cleanup approaches to achieve desired degrees of discrimination and quantitation.

5. Health and Safety

The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound must be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material data handling sheets is available to all personnel involved in the chemical analysis. PCBs have been tentatively classified as known or suspected human or mammalian carcinogens. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.1 Lab coats, safety glasses, and gloves must be worn when handling samples, extracts, standards or solvents.

5.2 All solvent and extract transfers must be handled in the vented bench area in the GC laboratory.

5.3 All stock standards, working standards, and vialed sample extracts must be placed into the waste bucket in the lab, for future disposal by the Hazardous Waste Manager. The container must be labeled properly with hazard warning labels indicating the container contents.

5.4 Bottles containing flammable solvents must be stored in the flammables cabinet.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection

Aqueous samples are collected in two 1L amber glass jars with teflon-lined lids. Solid samples are collected in one 250 mL wide-mouth glass jar with a teflon-lined lid. All containers are purchased pre-cleaned and certified from commercial vendors.

6.2 Sample Preservation

Both aqueous and solid samples are then preserved by packing in coolers with ice or ice packs, to maintain a temperature of 4 ± 2° C. Upon receipt at the laboratory, the samples are transferred into sample storage refrigerators to maintain at a temperature of 4 ± 2° C.

6.3 Sample Handling

Aqueous samples must be extracted within 7 days of sample collection, solid samples within 14 days of collection. Once extracted, the samples must be analyzed within 40 days of the extraction date.

7. Equipment and Supplies

7.1 Gas Chromatograph, Hewlett Packard 6890: An analytical system complete with gas chromatograph configured for split-splitless injection and all required accessories including syringes, analytical columns, gases, electron capture detectors (ECD), and data system.

7.2 GC Columns: Alpha utilizes dual-column analyses. The dual-column approach involves either a single injection that is split between two columns that are mounted in a single gas chromatograph, or dual injections of the split extract on a single GC equipped with two columns. Typical column pairs used are listed below. Other columns may be used as long as method performance criteria can be met.

7.2.1 Column pair 1

30m x 0.32mm ID fused silica capillary column chemically bonded with SE-54 (RTX-CLP or equivalent), 0.32µm film thickness.

30m x 0.32mm ID fused silica capillary column chemically (CLP-pesticideII, or equivalent) 0.25µm film thickness.

7.3 Volumetric Flasks: 10mL and 25mL, for the preparation of standards.

7.4 Microsyringes/Wiretrol syringes: 10 µL – 1000 µL

7.5 Disposable Borosilicate Pipets

7.6 Vials: 2 mL clear glass, crimp-top and screw-cap.

8. Reagents and Standards

Reagent grade or pesticide grade chemicals are used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficient high purity to permit its use without lessening the accuracy of the determination.

NOTE: Store the standard solutions (stock, composite, calibration, internal, and surrogate) at 4 ± 2° C in Teflon(R)-sealed containers in the dark. When a Lot of standards is prepared, aliquots of that Lot are stored in individual small vials. All stock standard solutions must be replaced after one year or sooner if routine QC tests indicate a problem. All other standard solutions must be replaced after six months or sooner if routine QC indicates a problem.

8.1 n-Hexane: Pesticide quality or equivalent.

8.2 Acetone: Pesticide quality or equivalent.

8.3 Methylene chloride: Pesticide quality or equivalent.

8.4 Organic-free Reagent Water: All references to water in this method refer to organic-free reagent water from Alpha's RO water treatment system.

8.5 Stock Standard Solutions: All stock standard solutions are purchased from commercial vendors as ampulated certified solutions. When an ampulated stock solution is opened, it is transferred to a labeled amber screw-cap vial. The expiration date of the stock solution is either the vendor specified expiration date, or 1 year from the date the ampule was opened, whichever is sooner. Typical stock standard concentrations are listed in Table 1.

8.6 Calibration Standards: Calibration standards are prepared volumetrically by diluting the appropriate stock standard(s) with hexane. Calibration standards expire 6 months from the date of preparation, or on the earliest expiration date of any of the stock solutions used to prepare the calibration standard. Calibrations are performed at the 6 concentration levels listed in Table 1.

8.7 Internal Standard Solution: 1-Bromo-2-nitrobenzene is used as the internal standard, and is added to all single-component calibration standards and sample extracts to achieve a concentration of 0.25 µg/mL.

8.8 Surrogate Standards:

8.8.1 Tetrachloro-m-xylene and Decachlorobiphenyl are used as surrogates for Aroclor analysis. They are added to the calibration standards at the concentrations listed in Table 1, and are spiked into all samples and QC samples prior to extraction. The spiking solution is prepared in acetone at the concentrations listed in Table 1.

8.9 LCS/MS Spiking Solutions: The LCS/MS spiking solutions are prepared volumetrically by diluting the appropriate stock standards in acetone. The spiking solution concentrations are listed in Table 1.

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 Blank(s)

Extraction blanks are performed with each extraction batch of 20 or less samples, according to the extraction SOPs. The extraction blank must not contain any of the reportable analytes above the reporting limit. If any reportable analytes are detected in the blank, the entire extraction batch is suspect and re-extraction of all associated samples is required, unless the associated samples are non-detect.

9.2 Laboratory Control Sample (LCS)

A Laboratory Control Sample (LCS) is extracted with each analytical batch. The LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume. For Aroclor analysis, the LCS is spiked with a mixture of Aroclor 1016 and 1260. The concentrations of the spiking solutions are listed in Table 1. The recovery acceptance criteria are listed in Table 2. If any recovery criteria are not met, the extract may be re-analyzed. If the criteria are still not met, the entire batch is re-extracted, unless the recoveries are high and the associated samples are non-detect. If this is not possible, due to insufficient sample or holding time exceedence, the analyst must narrate the failure in the LIMSfor inclusion in the client report.

9.3 Initial Calibration Verification (ICV)

Refer to Section 10.2.

9.4 Continuing Calibration Verification (CCV)

Refer to Section 10.4.

9.5 Matrix Spike

Upon client request, a matrix spike and matrix spike duplicate pair is extracted and analyzed with each batch of 20 or less samples. The MS/MSD pair is extracted and analyzed for standard PCB analysis. The PCB spike compounds and concentrations are listed in Table 1. The recovery acceptance criteria are listed in Table 2. If the recovery criteria are not met, but are met in the LCS, the failure may be attributed to sample matrix effects and must be narratedfor inclusion in the client report.

9.6 Laboratory Duplicate

Upon client request, a Laboratory Duplicate is extracted and analyzed with each batch of 20 or less samples. The relative percent difference (RPD) acceptance criteria are listed in Table 2. If the RPD criteria are not met, the failure may be attributed to matrix effect and must be narrated for inclusion in the client report.

9.7 Method-specific Quality Control Samples

9.7.1 **Surrogates:** All extracted samples and associated QC are spiked with surrogates at the levels listed in Table 1. The laboratory must evaluate surrogate recovery data from individual samples and QC samples versus the surrogate control limits listed in Table 2. If the surrogate limits are not met, the extract may be reanalyzed to determine if the failure was due to an instrument problem. If the criteria are still not met, the affected samples must be re-extracted to confirm that the failure was due to sample matrix, unless the surrogate recovery is high and the associated sample is non-detect. If matrix effect is confirmed, this must be noted on a narrative sheet for inclusion in the client report.

9.8 Method Sequence

Typical Initial calibration (each level to identify the standard lot number)

2. Std Level 1
3. Std Level 2
4. Std Level 3
5. Std Level 4
6. Std Level 5
7. Std Level 6
8. Initial Calibration Verification Standard (ICV)

Repeat steps 2 – 7 as needed for each Aroclor necessary for calibration.

[**NOTE:** If multiple calibration mixtures are analyzed, it is acceptable to analyze appropriate ICVs after all calibration standards have been injected.]

Typical Daily sequence:

1. 1016/1260 Continuing Calibration Standard; identified with the standard lot number 2. Extraction Blank
3. Laboratory Control Sample
4. Matrix Spike / Matrix Spike Duplicate (if requested by Client)
5. Duplicate (if included with batch QC)
6. Samples (4 – 8)
7. Cal check (Typically alternating the Aroclors)

Repeat 2 – 7 (as needed)

10. Procedure

10.1 Equipment Set-up

10.1.1 Sample Extraction

Water samples are extracted at a neutral pH with methylene chloride using a separatory funnel (Method 3510). See extraction SOP for details.

Solid samples are extracted with methylene chloride: acetone (1:1) using Soxhlet extraction (Method 3540C) procedures. Solid samples may also be extracted with hexane: acetone (1:1) using Method 3546 (microwave). See extraction SOP for details.

10.1.2 Extract Cleanup

Cleanup procedures may not be necessary for a relatively clean sample matrix, but most extracts from environmental and waste samples will require additional preparation before analysis. The sulfuric acid cleanup method (Method 3665) is utilized. See extraction SOPs for details as well as the Copper cleanup method (method 3660B).

10.1.3 GC Conditions:

The dual-column / dual-detector approach involves the use of the columns listed in section 7.2. The columns are connected to an injection tee or dual injection GC, and separate electron capture detectors. Typical GC conditions for the HP 6890 instruments utilizing column pair 1, are listed below, but may be altered as long as method performance criteria are met.

Temperature 1:	120 °C
Time 1:	0 minute
Ramp 1:	35 °C/minute
Temperature 2:	200 °C
Time 2:	0 minutes
Ramp 2:	15° C/minute
Temperature 3:	260 °C
Time 3:	0 minute
Ramp 3:	°C/minute
Final temperatur	325 °C
Final time:	2.00 minutes
Injector temperature:	250 °C
Injector mode:	Pulsed Split
	2:1 split, 0.75 min pulse
Injector Flow:	6.0 mL/min split flow
Detector temperature:	375 °C
Carrier gas:	Helium
Carrier flow:	3 mL/min
Carrier mode:	Constant flow
Makeup gas:	Argon/methane (P5)
Total detector flow:	55 mL/min

Injection volume: 1 µL

10.2 Initial Calibration

10.2.1 Prepare calibration standards using the procedures in Section 8.6 and Table 1. The calibration standards are aliquoted into autosampler vials and capped prior to loading onto the autosampler tray.

10.2.2 Establish the GC operating conditions by loading the appropriate GC method. Typical instrument conditions are listed in section 10.1.3. The same operating conditions are used for calibrations and sample analyses. Create the analytical sequence using the Turbochrom or Agilent Chemstation data acquisition software.

Record the calibration standard, unique lab identifier code (lot), concentration, and analyst's initials in the analytical sequence list.

10.2.3 A 1µL injection volume of each calibration standard is typically used. Other injection volumes may be employed, provided that the analyst can demonstrate adequate sensitivity for the compounds of interest. The same injection volume must be used for all standards and samples.

10.2.4 Column adsorption may be a problem when the GC has not been used for a day or more or after system maintenance. The GC column may be primed (or deactivated) by injecting a PCB standard mixture approximately 20 times more concentrated than the mid-concentration standard. Inject this standard mixture prior to beginning the initial calibration or calibration verification.

Alternately, the system may be primed by baking at the final analytical temperature for approximately 30 minutes.

Several analytes may be observed in the injection just following system priming. Always run an instrument blank after system priming.

10.2.5 Calibration Factors

Internal standard calibration techniques are employed in this method.

10.2.5.1 Internal Standard Procedure. In each standard, calculate the response factor (RF) for each analyte, the average RF, and the relative standard deviation (RSD) of the RFs, using the Target or Enviroquant data processing software. The calculations are performed automatically, using the formulae listed in Alpha's Quality Manual.

10.2.6 Initial Calibration Criteria

If the RSD for an analyte is $\leq$ 20%, then the response of the instrument for this compound is considered linear over the range and the mean calibration factor can be used to quantitate sample results.

If the RSD for any analyte is > 20%, then linearity through the origin cannot be assumed. The mean response factor cannot be used for quantitation. An alternative calculation may be done by the use of linearity as long as the correlation coefficient is $\geq$0.995. If both of these quantitation methods fail criteria for any compound in the initial calibration, then the system must be reevaluated and a new calibration curve must be analyzed.

10.2.6.1 Initial Calibration Verification

An initial calibration verification standard must be run immediately after each initial calibration, near the midpoint of the curve. The standard must be prepared using a second source that is different than the source used for the initial calibration. The %D is the same as the CCV (see Section 10.4.1.1).

10.2.7 Retention Time Window

10.2.7.1 The retention time window used for the identification of target analytes is ± 0.07 minutes. These criteria have been adopted from the EPA CLP Statement of Work (OLM04.2). It has been found that these limits work well, being wide enough to eliminate false-negatives while being tight enough to eliminate false-positives. Windows that are calculated using the procedure recommended in Method 8000 tend to be very narrow, creating the risk of false negative results.

10.2.7.2 The windows listed above are used as guidance; however the experience of the analyst weighs heavily in the interpretation of the chromatograms. For example, it has been observed that certain oil matrices can cause the retention times to shift more dramatically.

10.3 Equipment Operation and Sample Processing

10.3.1 The same GC operating conditions used for the initial calibration must be employed for sample analyses, including sample injection volume (Section 10.1.3).

10.3.2 Tentative identification of an analyte occurs when a peak from a sample extract falls within the retention time window for the compound. Each tentative identification is confirmed using a second GC column of dissimilar stationary phase. Confirmation is positive when the %RPD is ≤ 40% from the results of the two columns.

10.3.2.1 In addition to utilizing retention time windows, the pattern of peaks in the sample extract is compared to the known Aroclor patterns.

10.3.3 The concentration reported for an identified target analyte in an extract is calculated using the Target or Enviroquant data processing software. Proper quantitation requires the appropriate selection of a baseline from which the peak area or height can be determined. See the Manual Integration SOP for integration guidelines.

10.3.3.1 If the responses exceed the calibration range of the system, dilute the extract with Hexane and reanalyze.

10.3.4 Each sample analysis must be bracketed with an acceptable calibration verification standard (each 12-hour analytical shift), or calibration verification standards interspersed within the samples, with the exception of those samples analyzed under WCS-CAM-VA. When a calibration verification standard fails to meet the QC criteria, all samples that were injected after the last standard that last met the QC criteria must be re-injected.

Calibration verification standards that are interspersed throughout the analytical sequence are varied to verify performance of all analytes.

10.3.5 Sample injections may continue for as long as the calibration verification standards and standards interspersed with the samples meet instrument QC requirements. Standards are typically analyzed after every 4 – 8 samples to minimize the number of samples that must be re-injected when the standards fail the QC limits. However, a calibration verification standard must be analyzed after every 20 samples. The sequence ends

when the set of samples has been injected or when qualitative and/or quantitative QC criteria are exceeded.

10.3.6 Use the calibration standards analyzed during the sequence to evaluate retention time stability. The retention time windows are established using the absolute retention time of each analyte in the mid-concentration standard during the initial calibration as the mid-point of the window. The widths of the windows are defined in Section 10.2.7.

10.3.7 Each subsequent injection of a standard during the 12-hour analytical shift (i.e., those standards injected every 20 samples, or more frequently) must be checked against the retention time windows. If any of these subsequent standards fall outside their absolute retention time windows, the GC system is out of control. Determine the cause of the problem and correct it. If the problem cannot be corrected, a new initial calibration must be performed.

10.3.8 Identification of mixtures (i.e. Aroclor 1248) is based on the characteristic 'fingerprint' retention time and shape of the indicator peak(s); and quantitation is based on the area under the characteristic peaks as compared to the area under the corresponding calibration peaks(s) of the same retention time and shape generated using internal calibration procedures.

10.3.9 If compound identification or quantitation is precluded due to interference (e.g., broad, rounded peaks or ill-defined baselines are present) cleanup of the extract may be needed. If instrument problems are suspected, rerun the extract on another instrument to determine if the problem results from analytical hardware or the sample matrix. Refer to the extraction SOPs for the procedures to be followed in sample cleanup.

10.4 Continuing Calibration

10.4.1 Verify calibration each 12-hour shift by injecting calibration verification standards prior to conducting any sample analyses. A calibration standard must also be injected at intervals of not less than once every twenty samples (after every 4 - 8 samples is routine practice to minimize the number of samples requiring re-injection when QC limits are exceeded) and at the end of the analysis sequence.

10.4.1.1 The response factor (for internal standard compounds) for each analyte to be quantitated must not exceed a ± 15% difference when compared to the initial calibration curve. The Target data processing software automatically calculates the %D for all analytes according to the formulae in Alpha's Quality Manual.

10.4.1.2 If this criterion is exceeded, inspect the gas chromatographic system to determine the cause and perform whatever maintenance is necessary before verifying calibration and proceeding with sample analysis.

10.4.1.3 If routine maintenance does not return the instrument performance to meet the QC requirements (Section 9) based on the last initial calibration, then a new initial calibration must be performed. Due to the large number of analytes present, allowances may be made for a RF that drifts out high, as long as there are no positive hits for that particular analyte in any of the associated samples. Any QC failures must be narrated in the LIMS for inclusion with the sample data.

10.4.2 Compare the retention time of each analyte in the calibration standard with the absolute retention time windows described in section 10.2.7. The center of the absolute retention time window for each analyte is its retention time in the mid-concentration standard analyzed during the initial calibration. Each analyte in each standard must fall within its respective retention time window. If not, the gas chromatographic system must either be adjusted so that a second analysis of the standard does result in all analytes falling within

their retention time windows, or a new initial calibration must be performed and new retention time windows established.

10.5 Preventive Maintenance

10.5.1 Preventive Maintenance

Routine preventive maintenance is performed to maintain GC system performance. This includes periodic replacement of injector septa, replacement of injector liner(s), and replacement of injector seals.

10.5.2 Other Maintenance

ECD detectors may become contaminated, requiring bake out at elevated temperatures, or repair by the manufacturer.

11. Data Evaluation, Calculations and Reporting

11.1 Quantitation of Aroclors

Per Method 8082, quantitation is based on the use of a minimum of 3 of the major peaks present in the analyte, although the use of 5 of the major peaks is recommended. Each of these peaks is individually calibrated with a minimum of five calibration points based on average response factors. The %RSD must meet the criteria of ≤20% for the ICAL. The five major peaks are calculated as described below. After individual calculation meets criteria, the average of the peaks selected for quantitation is used to determine the final concentration.

11.1.1 Aqueous samples

$$\text{Concentration } (\mu g/L) = \frac{C \times DF \times Vf \times 1000}{Vo}$$

where:

C = Extract concentration (µg/mL), **NOTE**: ng on column = ng/injection volume = ng/uL = ug/mL
DF = Dilution factor
Vf = Final extract volume (mL)
Vo = Sample volume (mL)

11.1.2 Soil/sediment samples

$$\text{Concentration } (\mu g/Kg, \text{ dry weight}) = \left[\frac{C \times DF \times Vf \times 1000}{W\ (gm)}\right] \div \%S$$

where:

C = Extract concentration (µg/mL), **NOTE**: ng on column = ng/injection volume = ng/uL = ug/mL
DF = Dilution factor
Vf = Final extract volume (mL)
W = Weight of the sample extracted (10g for high, 30g for low)
%S = Percent solids, as a decimal value

11.1.3 Reporting Results

11.1.3.1 After performing technical data review, validating that all QC criteria have been met and confirming all positive hits, the data report is sent electronically to the LIMS computer for generation of the client report. There are two levels of review of the data in the LIMS system prior to release of data. These reviews must be done by two separate individuals.

11.1.3.2 Reporting Results for PCBs in Caulk Samples

If the sample concentration as calculated above for any Aroclor is > 50ppm, the Client is contacted by a Customer Service Representative and these results are sent to the LIMS and reported to the Client.

If the sample concentration as calculated above for any Aroclor is < 50ppm, the sample is sent for re-extraction by Method 3540C (Alpha SOP/02-04).

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

Holding time exceedence and/or improper preservation are noted on the nonconformance report form.

Perform instrument maintenance as described throughout this SOP as needed when instrument calibration criteria are not met. Record all maintenance in the instrument logbook.

All batch and sample specific QC criteria outlined in Section 10 are evaluated by the analyst prior to approval of the data. When any QC criteria fail, the cause for the failure must be identified and corrected. This may include instrument recalibration followed by sample reanalysis, sample cleanup, or sample re-extraction. If it is determined that the failure is due to sample matrix effects, a project narrative report is written into the LIMS by the analyst for inclusion in the data report. If there is insufficient sample volume to perform the re-analysis for confirmation, this is also noted in the narrative and included in the client report.

13. Method Performance

13.1 Method Detection Limit Study (MDL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

The laboratory follows the procedure to determine the MDL, LOD, and/or LOQ as outlined in Alpha SOP/08-05. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

Refer to Alpha SOP/08-12 for further information regarding IDC/DOC Generation.

13.2.1 Initial (IDC)

The analyst must make an initial, one-time, demonstration of the ability to generate acceptable accuracy and precision with this method, prior to the processing of any samples.

13.2.2 Continuing (DOC)

The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

Refer to Alpha's Chemical Hygiene Plan and Waste Management and Disposal SOP for further pollution prevention and waste management information.

15. Referenced Documents

Chemical Hygiene Plan

SOP/08-05 MDL/LOD/LOQ Generation

SOP/08-12 IDC/DOC Generation

SOP/14-01 Waste Management and Disposal SOP

16. Attachments

Table 1: STANDARD SOLUTIONS

Table 2: QC ACCEPTANCE CRITERIA

TABLE 1

STANDARD SOLUTIONS

	Stock solution (ug/mL)	Level 6 (ug/mL)	Level 5 (ug/mL)	Level 4 (ug/mL)	Level 3 (ug/mL)	Level 2 (ug/mL)	Level 1 (ug/mL)	Spike Solution (ug/mL)	LCS Solution (ug/mL)
PCB 1016/1260 Mix									
Aroclor 1016	100	0.1	10	5	2.5	1.0	0.5	12.5	12.5
Aroclor 1260	100	0.1	10	5	2.5	1.0	0.5	12.5	12.5
Aroclors 1221, 1232, 1242, 1254, 1262, 1268	100	0.1	10	5	2.5	1.0	0.5		
Internal Standard									
1-Bromo-2-Nitrobenzene	5000	0.25	0.25	0.25	0.25	0.25	0.25		
Surrogates: Aroclor Analysis									
Tetrachloro-m-xylene	2.0	0.64	0.32	0.16	0.08	0.04	0.02		
Decachlorobiphenyl	2.0	1.28	0.64	0.32	0.16	0.08	0.04		

TABLE 2

QC ACCEPTANCE CRITERIA

	Aqueous		Soil	
Surrogate % Recovery: Aroclor Analysis	**Lower Control Limit**	**Upper Control Limit**	**Lower Control Limit**	**Upper Control Limit**
2,4,5,6-Tetrachloro-m-xylene	30%	150%	30%	150%
Decachlorobiphenyl	30%	150%	30%	150%

	Aqueous % Recovery		Soil % Recovery		Duplicate and/or MSD	
MS/MSD and LCS	**Lower Control Limit**	**Upper Control Limit**	**Lower Control Limit**	**Upper Control Limit**	**Aqueous RPD**	**Soil RPD**

Aroclor 1016	40%	140%	40%	140%	30%	50%
Aroclor 1260	40%	140%	40%	140%	30%	50%

Soxhlet Extraction

References: **EPA Method 3540C** SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, 1997.

Analysis of Extractable Petroleum Hydrocarbon Compounds (EPH) in Aqueous and Soil/Sediment/Sludge Matrices, New Jersey Dept. of Environmental Protection Site Remediation Program, (version 1.1), October 2009 Revision 2

Method 8081, Reference: SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, 1997.

Method 8082, Reference: SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, 1997.

Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), Massachusetts DEP, ORS, BWSC. MADEP-EPH-04-1, Revision 1.1 May 2004.

CT-ETPH, Environmental Research Institute – University of Connecticut, March 1999.

Maine 4.1.25, Maine Health and Environmental Testing Laboratory, 09/06/1995.

EPA 8015B (Modified), SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, EPA SW-846, Update III, December 1996

Extractable Petroleum Hydrocarbons Methodology, New Jersey Department of Environmental Protection, **NJDEP EPH** 10/08, Revision 2 October 2009.

1. Scope and Application

Matrices: This method is applicable to solids, soils, and sludges.

Definitions: Refer to Alpha Analytical Quality Manual.

This method is applicable to the extraction of semivolatile organic compounds from solids such as soils, sludges, and wastes. The Soxhlet extraction procedure ensures intimate contact of the sample matrix with the extraction solvent.

This method is applicable to the extraction of a variety of semivolatile organic compounds, which are then be analyzed by the appropriate chromatographic procedure(s).

The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one or more of the following laboratory personnel before performing the modification: Area Supervisor, Department Supervisor, Laboratory Director, or Quality Assurance Officer.

This method is restricted to use by or under the supervision of trained analysts. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability and completing the record of training.

After initial demonstration, ongoing demonstration is based on acceptable laboratory performance of at least a quarterly laboratory control sample or acceptable performance from an annual proficiency test sample. A major modification to this procedure requires demonstration of performance. The identification of major method modification requiring performance demonstration is directed by the Quality Assurance Officer and/or Laboratory Director on a case-by-case basis.

2. Summary of Method

Weighed samples, around 15 grams, are prepared for extraction by mixing the sample with anhydrous sodium sulfate until the sample is free flowing. The sample is then placed in a Soxhlet extractor using the appropriate solvent (Table 1). The extract is allowed to cool prior to proceeding with additional extract preparation steps.

Any water is removed from the sample extract by filtering through a powder funnel containing approximately 20g of anhydrous sodium sulfate. The extract is then concentrated and, as needed, exchanged into a solvent compatible with the cleanup or determinative step being employed.

2.1 Method Modifications from Reference

None.

3. Reporting Limits

Refer to analytical method SOPs for Reporting Limit information.

4. Interferences

4.1 The most common cause of contamination is from improperly cleaned glassware and lab supplies. All glassware and re-useable extraction equipment (i.e. spatulas) must be scrupulously cleaned, following the cleaning SOP.

4.2 Impurities in solvents and reagents may also yield artifacts and/or interferences that may compromise the results of sample analysis. All of these materials must be demonstrated to free from interferences under the conditions of extract preparation and analysis by preparing method blanks with each extraction batch. The same solvents and reagents are used for the method blank and the associated samples.

4.3 Phthalate esters contaminate many types of products used in the laboratory. Plastic materials must not contact the samples or extracts, as phthalates could be easily leached from the plastic. The exception is in the use of various pre-packed reagent cartridges (Florisil, Silica gel) used in the extract cleanup steps. Each new lot of cartridges is checked for contamination, and is monitored on an on-going basis through the analysis of method blanks.

4.4 Additional specific interference or contamination concerns are addressed in the various analytical SOPs

5. Health and Safety

The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material safety data sheets is available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.1 Lab coats, safety glasses, and gloves must be worn when handling samples, extracts, standards or solvents and when washing glassware.

5.2 All extract concentration steps must be performed in the extraction hoods. All solvent and extract transfers must also be handled in the hood.

5.3 All expired stock standards, working standards, and spent sample extracts must be placed into the waste bucket in the lab, for future disposal by the Hazardous Waste Manager. The container must be properly labeled with hazard warning labels indicating the container contents.

5.4 Bottles containing flammable solvents must be stored in the flammables cabinet or in the vented cabinets found under the hoods

5.5 All waste solvents must be transferred to the satellite waste storage containers located in the extraction lab. Separate containers are provided for chlorinated and non-chlorinated solvents and must be used accordingly. Under no circumstances are solvents to be poured down the sink drains.

5.6 Inspect all glassware prior to use. Do not use any glassware that is chipped, cracked or etched if it could present a safety hazard. Damaged glassware is put aside for repair, otherwise discard the piece.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection

Sample collection and preservation requirements are described in the various analytical method SOPs.

6.2 Sample Preservation

None.

6.3 Sample Shipping

No specific requirements.

6.4 Sample Handling

All soil samples are stored, refrigerated, in the Custody Sample Bank. Samples are taken by the analyst immediately prior to sample extraction. The analyst must take custody of the samples by signing them out utilizing the LIMS.

All samples must be fully homogenized prior to taking the sample aliquot, as described in Section 10.1.2. After the sample aliquot is removed, the samples are returned to the Sample Bank and placed in the sample return refrigerator. Custody of the samples is transferred back by signing them back in utilizing the LIMS.

After the extraction is performed, the sample extract is stored in a stoppered Concentrator tube before being transferred to a crimp-top or screw cap vial for analysis and long-term storage (See Work Form Cleanup and Vialing 02-50).

7. Equipment and Supplies

7.1 Small Soxhlet Extractor: 45/50, with 250mL or 300mL round bottom flask.

7.2 Refrigerated Water Recirculator: Allows solvents to cool in the condenser while extracting.

7.3 Analytical Balance: Capable of weighing to 0.1g.

7.4 Heating Mantle: Rheostat controlled.

7.5 Heating Plate: Rheostat controlled.

7.6 Spatulas: Stainless steel and Teflon.

7.7 Beakers: 250mL, 400mL.

7.8 Aluminum weighing dishes: VWR Cat #25433-089.

7.9 Mortar and Pestle: Capable of reducing particle size to <1mm.

7.10 Kuderna-Danish (KD) apparatus: Assemble by attaching the Concentrator Tube to the Evaporation Flask using the Plastic clip. Add the Macro column to the Evaporation Flask. The Micro Snyder Column is attached directly to the Concentrator Tube using the Plastic Clip.

7.10.1 Concentrator tube: 25mL, graduated and calibrated. A ground-glass stopper is used to prevent evaporation of extracts.

7.10.2 Evaporation flask: 500mL.

7.10.3 Snyder column: Three-ball macro.

7.10.4 Snyder column: Micro.

7.10.5 Plastic clamps

7.11 Water Bath: Heated, capable of temperature control (± 5°C). The bath must be used in a hood.

7.12 Boiling Chips: Solvent-extracted, approximately 10/40 mesh (silicon carbide).

7.13 Autopipettes: 250, 1000µL

7.14 Brady labeling system: Thermal label generator

7.15 Powder Funnel.

7.16 Glass wool: SUPELCO, silane treated.

7.17 N-EVAP: Organomation; utilized for micro blow down.

7.18 Turbo Vap II: Auto-concentrator; Caliper Life Sciences.

7.19 Zymark Tubes: 50mL or 200mL

7.20 Gauze Pad: 2"x2" 12 ply, Used as a blank matrix for wipe samples

7.21 Autovial-Syringless Filter Device- 0.45um PTFE Membrane

8. Reagents and Standards

Reagent grade inorganic chemicals are used in all tests. All reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades are used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

8.1 Reagent Water: All references to water in this method refer to reagent water from Alpha's DI water treatment system.

8.2 Sodium Sulfate (Na_2SO_4): Granular anhydrous; purified by baking at 400°C for 4 hours in a shallow tray. Store in closed glass containers. All references to sodium sulfate in this method refer to this prepared reagent.

8.3 Methylene Chloride: Pesticide quality or equivalent. No expiration date listed.

8.4 Hexane: Pesticide quality or equivalent. No expiration date listed.

8.5 Acetone: Pesticide quality or equivalent. No expiration date listed.

8.6 1:1 Acetone/Methylene Chloride: Using a 2000mL Graduated Cylinder add 2000mL of Acetone and 2000mL of Methylene Chloride to a 4 Liter amber bottle and record preparation.

8.7 Nitrogen Gas: Reagent grade, used to purge and pressurize the extraction cell and as the blow-down gas in the Turbovap II auto-concentrator units and the N-EVAP.

8.8 Spiking Solutions: The various surrogate and LCS/MS spiking solutions used in the extraction steps are listed in Table 2. The preparation and expiration dates of these solutions are described in the analytical SOPs.

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

Each extraction batch contains various QC samples used to ensure the validity of the sample results. The particular QC elements performed for a given extraction batch are determined by the requirements of the determinative method. The purpose and definition of the QC samples performed are listed below. The specific QC requirements of the analytical methods are listed in Table 2.

9.1 Blank

Blanks, or method blanks, are measured aliquots of clean matrix (typically sodium sulfate for soil extractions) that are treated identically to the associated samples. Surrogates are added, and the blanks are carried through all stages of the sample extraction, concentration, and cleanup procedures. Blanks serve to ensure that no systematic contamination exists. A blank is extracted with each batch or 20 or less samples.

9.2 Laboratory Control Sample / Laboratory Control Sample Duplicate (LCS/LCSD)

LCS samples are measured aliquots of clean matrix (typically sodium sulfate for soil extractions) that are spiked with a solution containing known amounts of target compounds, in addition to the surrogate solution. The LCS is carried through all stages of the sample extraction, concentration, and cleanup procedures. LCS samples serve as batch specific quantitative checks of the extraction. An LCS is extracted with each batch of 20 or less samples.

An LCSD is performed in addition to an LCS for most methods, as well as in lieu of the MS/MSD or Duplicate when there is insufficient sample volume available. The required solutions and volumes are listed in Table 2.

9.3 Initial Calibration Verification (ICV)

Not Applicable.

9.4 Continuing Calibration Verification (CCV)

Not Applicable.

9.5 Matrix Spike / Matrix Spike Duplicate (MS/MSD)

MS and MSDs are field samples spiked with a known quantity of the target analyte(s). They are prepared by taking additional sample aliquots, and adding the appropriate amounts of surrogate and spiking solutions. The MS/MSD are carried through all stages of the sample extraction, concentration, and cleanup procedures. MS samples serve as a measure of extraction accuracy, by allowing the comparison of the found amount(s) of target analyte(s) with the spiked amount(s). An MS/MSD set also allows for the calculation of the extraction precision, by comparing the results of the two samples.

9.6 Laboratory Duplicate

Duplicates are laboratory selected replicate samples, prepared by taking an additional sample aliquot of a sample. The duplicate is carried through all stages of the sample extraction, concentration, and cleanup procedures. Duplicates serve as a measure of the extraction precision, by comparing the results of the sample and duplicate.

9.7 Method-specific Quality Control Samples

9.7.1 Surrogate

Surrogates are compounds specified by the analytical method that are added to all samples and QC samples prior to beginning the extraction process. Surrogate recoveries are calculated and serve as a sample specific quantitative check of the extraction. The various spiking solutions are prepared according to the directions found in the analytical SOPs. The required solutions and volumes used are listed in Table 2.

9.8 Method Sequence

See Section 10.

10. Procedure

10.1 Sample Preparation and Extraction

10.1.1 Before starting the extraction process, each soil or sediment sample should be visually inspected. If a sample contains a significant amount of free water, notify your supervisor. Record this in the Electronic Laboratory Notebook (ELN). Throughout the extraction process samples are labeled following Work Instruction WI/02-03, Labeling and Generating Work Groups and Batches.

Any artifacts (rocks, leaves, sticks, or similar materials) are not typically considered part of the soil sample and should not be included. If necessary, transfer these artifacts to another container prior to homogenizing the sample. Note the presence of sample artifacts in the ELN. Gummy, fibrous, or oily materials not amenable to grinding should be cut, shredded, or otherwise reduced in size to allow mixing and maximum exposure of the sample surfaces for the extraction. The addition of anhydrous sodium sulfate to the sample (1:1) may make the mixture amenable to grinding. If this needs to be done, weigh the sample prior to addition of the sodium sulfate.

10.1.2 Homogenize the sample well by mixing the entire contents of the sample container. In instances where the sample container is filled to the top and packed in tightly, the entire sample contents are emptied into a larger glass container (400mL glass beaker) and homogenized. If this is difficult due to sample matrix, describe the non-homogeneity in the ELN. Place the 300mL beaker or aluminum weighing dish (if the sample is a PCB) onto the tared balance. Weigh 14-16 grams of sample and record in the ELN. Add approximately 15g anhydrous sodium sulfate to the beaker and mix with a spatula until a free flowing powder is obtained. For samples that contain higher amounts of water or organic matter, larger amounts of sodium sulfate may be required. Certain samples may require grinding with a mortar and pestle to achieve the free flowing consistency.

10.1.2.1 For wipe (matrix 7) samples: Use the entire sample, pour it directly into the soxhlet set-up (see 10.1.3 for details on soxhlet extractor set-up).

10.1.3 See Work Instruction **WI**/02-03 for proper glassware labeling procedures. For each QC sample and extraction sample pour approximately 200mL of the extraction solvent (Section Table 1) into a 250mL or 300mL round bottom flask containing one or two clean boiling chips. .Attach the flask to the extractor. Plug the extractor siphon tube with a wad of glass wool using a stainless steel spatula. Add approximately 10-15 grams of sodium sulfate to the extractor to hold the glass wool in place. Note, do not clog the siphon tube with sodium sulfate. Using a stainless steel spatula transfer the sample to the soxhlet extractor.

10.1.4 Using the auto pipette, add the appropriate volume(s) of surrogate and spike solution(s) listed in Table 2 to the samples and QC samples. The spiking procedure must be witnessed by another chemist and recorded into the ELN. Attach the soxhlet set-up to the condensers and turn on the hot plates to the calibrated mark. Turn on the chiller serving the soxhlets being extracted. Chiller temp should be pre-set at 13C.

10.1.5 Extract the sample for 16 – 24 hours making sure to achieve four to six cycles/hour.

10.1.6 Allow the extract to cool after the extraction is complete.

10.1.7 After the extract has cooled, drain the solvent from the extractor into the round bottom flask. Tip the Soxhlet to empty. Rinse the Soxhlet with solvent if any residual sample is present. Place the Soxhlet in the hood to allow solvent to evaporate. Once dry, the samples are disposed of in the waste barrels.

10.2 Sample Concentration: KD Technique

10.2.1 Assemble a KD apparatus for each sample and QC by attaching the 25 mL concentrator tube to the bottom of the 500 mL KD flask. Use a blue clip to help insure that they do not separate. Place a boiling stone in the bottom of the concentrator tube. Assemble a powder funnel and place on top of the flask. Drain the sample through this powder funnel and rinse the round bottom 3 times with DCM, pour this rinseate into the KD as well. After the powder funnel is done draining remove and discard it. Alternatively, the sample may be filtered directly into a Zymark Tube for Turbovap concentration(See Section 10.3).

10.2.2 Attach a three-ball Snyder column to the top of the flask. Place the KD apparatus on a hot water bath (heated to approximately 75°C for samples extracted in Methylene Chloride and 95°C for samples extracted in Hexane) so that the concentrator tube is partially immersed in the hot water, and so that the entire lower rounded surface of the flask is bathed in hot water vapor. Adjust the position of the apparatus as required to complete the concentration in 30 to 40 minutes. At the proper rate of distillation, the balls in the column will actively chatter, but the chambers will not flood with solvent. Periodically rinse the internal walls of the concentrator tubes with DCM.

10.2.3 If a Hexane exchange is required (see Table 1), add 30 to 35mL of hexane), when the sample volume reaches approximately 10mLs. Add the hexane to the top of the Snyder column while the concentrator is still on the water bath. Continue with the concentration until the extract volume is reduced to below 10mL. Periodically rinse the internal walls of the synder column with Hexane. Remember to switch the extract to the higher temperature bath after the addition of hexane.

10.2.4 Remove the KD apparatus from the water bath. Rinse the flask and its lower ground glass joint with 1 to 2 mL of acetone to remove any moisture from the outside of the glassware. Allow to cool for 15 minutes. Disassemble the KD apparatus. Move the label from the K-D Flask to the concentrator tube (See WI/02-03).

10.2.5 Place the Concentrator tube on the N-EVAP. The N-EVAP is set at 37°C for samples extracted in Methylene Chloride and 65 °C for samples extracted in Hexane with the nitrogen flow at 5 - 7. Samples remain on N-EVAP until they are reduced to 1mL. Exception: ABN(625,8270,PAH) extracts that have a visual brownish tint or darker, or have sediment in the extract will require filtration through a 0.45um PTFE Autovial. This will eliminate some of the interferences associated with the analysis. While concentrating the extract using the N-evap, once the extract volume reaches 3-5mL remove the sample and transfer to the 0.45um PTFE autovial. Using the supplied PTFE plunger, push the extract through the filter into another 25mL concentrator tube. Remove the plunger from the vial and rinse the membrane with 2-3mL of Methylene Chloride and collect in the

same vial. Place the extract back on the N-evap for final concentration to 1.0mL. Note the use of the autovial in the ELN. Repeat the procedure for all ABN samples that meet the visual filtering requirement. Note that all associated QC samples are required to be filtered as well.

10.2.6 **Pesticide Extracts:** In the concentrator tube, adjust final volume to 10 mL with hexane.

10.2.7 The extract is now ready for sample cleanup or vialing (See Table 1). Refer to the relevant Clean-up SOP or proceed with vialing the extract. See vialing Form(02-50).

10.3 Alternate Concentration Technique

The equipment used for alternate sample concentration is the Zymark TurboVap II, which is a self-contained water bath and nitrogen blow-down. It is equipped with sensors to allow for automatic shutdown when the extract volume goes below 1mL. This technique is generally used for concentration of TPH samples.

10.3.1 The TurboVap is set at 37°C for samples extracted in Methylene Chloride. The nitrogen pressure is set to 10-15 psi and the endpoint concentration is set to 'Sensor'. The Zymark tube is labeled with the sample I.D.

10.3.2 Assemble a powder funnel and place on top of the Zymark tube. Drain the sample through this powder funnel and rinse the round bottom 3 times with DCM, pour this rinseate into the Zymark tube as well. After the powder funnel is done draining remove and discard it.

10.3.3 Place the labeled Zymark tube containing sample into the TurboVap II concentration unit. Start the nitrogen blow-down by pressing the button on the front panel of the unit.

10.3.4 When the concentration is complete, the nitrogen stream will be automatically shut off. The light on the front panel will flash, and the instrument will beep. Remove the tube from the Zymark concentrator; the final extract volume is 1mL. Refer to Form 02-50 for vialing instructions or the appropriate SOP for cleaning procedures.

10.4 Instrument Maintenance

10.4.1 Refrigeration Re-circulator

The Refrigeration Re-circulator should be checked periodically to insure that it is running correctly and that the level of reagent water is constant with manufactures recommendation.

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10.4.2 Zymark Turbovap II Concentrators

10.4.2.1 Maintain the level of the water bath by adding water daily to fill. Routinely discard visually dirty water and refill with clean water. This will extend the life of the extract level sensors in the bath.

10.4.2.2 Keep unit clean. Avoid solvent spills on or around unit. Clean periodically with a damp cloth.

10.4.3 Analytical Balance

10.4.3.1 All balances are calibrated and serviced every six months by an instrument service company. All service records are kept on file.

10.4.3.2 Keep balances clean. Brush off any sample spills immediately. Keep the balance doors closed and the balance turned off when not in use.

10.4.4 Water Bath

10.4.4.1 The water bath should be kept full at all times. Add reagent water as necessary.

10.4.4.2 Keep unit clean. Avoid solvent spills on or around unit. Clean periodically with a damp cloth.

11. Data Evaluation, Calculations and Reporting

Not Applicable.

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

Holding time exceedence and improper preservation are noted on the nonconformance report form.

When analysis of samples indicates possible extraction problems, such as poor surrogate recoveries, poor LCS/MS/MSD recoveries, or suspected contamination in blanks or samples, re-extractions are required. Depending on the particular failure, the re-extraction may be of a specific sample or the entire extraction batch.

The analyst that determines the need for re-extraction must fill out a sample re-extract request form. This form notes the reason for the re-extraction request along with any special requirements, and the date and time that the re-extract is needed. Re-extraction request forms are maintained on file to help track the cause for re-extractions, and to be used as a tool in improving systems to minimize the need for re-extractions.

Depending on the results of the re-extraction, the first, second, or both sets of results may be reported to the client, along with a narrative report detailing the problems encountered and the resolution.

13. Method Performance

13.1 Method Detection Limit Study (MDL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

The laboratory follows the procedure to determine the MDL, LOD, and/or LOQ as outlined in Alpha SOP/08-05. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

Refer to Alpha SOP/08-12 for further information regarding IDC/DOC Generation.

13.2.1 Initial (IDC)

The analyst must make an initial, one-time, demonstration of the ability to generate acceptable accuracy and precision with this method, prior to the processing of any samples.

13.2.2 Continuing (DOC)

The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

Refer to Alpha's Chemical Hygiene Plan and Waste Management and Disposal SOP for further pollution prevention and waste management information.

15. Referenced Documents

Chemical Hygiene Plan

SOP/08-05 MDL/LOD/LOQ Generation

SOP/08-12 IDC/DOC Generation

SOP/14-01 Waste Management and Disposal SOP

WI/02-03 Labeling and Generating Work Groups and Batches

WI/11-02 LIMS Electronic Laboratory Notebook Procedure

16. Attachments

Table 1 – Specific Extraction Conditions for Various Determinative Methods

Table 2 – Soil Extraction Guide

Table 1

Specific Extraction Conditions for Various Determinative Methods

LIMS Product Code	Extraction Solvent	Exchange Solvent Required	Typical Final Volume	Appropriate Cleanup Technique
8082	1:1 DCM/Acetone	hexane	1 mL	Sulfuric acid
8081	1:1 DCM/Acetone	hexane	10 mL	Florisil
8270	1:1 DCM/Acetone	---	1 mL	---
TPH *	DCM	---	1 mL	---
MA EPH	DCM	hexane	1 mL	Silica gel Fractionation
NJ EPH	DCM	hexane	1 mL	Silica gel Fractionation
ETPH	DCM	---	1 mL	Silica gel

***TPH includes the following LIMS Products: TPH-DRO and TPH-DRO-D**

Table 2

Soil Extraction Guide

LIMS Product Code	QC	Solvent	Surrogate Solution	LCS/LCSD MS/MSD Solution
8270	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP ABN
MCP 8270	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP ABN
PAH	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP ABN
MCP PAH	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP ABN
PAH-Low	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP PAH-Low
MCP PAH-Low	SB, LCS, LCSD	DCM/ACE	1mL ABN	1mL MCP PAH-Low
8081/ MCP-8081	SB, LCS, LCSD	DCM/ACE	1mL PEST	1mL Pest
NJ/NYTCL-8081	SB, LCS, LCSD	DCM/ACE	250µL PEST	250µL Pest
PCB	SB, LCS, LCSD	DCM/ACE	250µL PEST	250µL PCB
MCP PCB	SB, LCS, LCSD	DCM/ACE	250µL PEST	250µL PCB
EPH	SB, LCS, LCSD	DCM	1mL EPH	1mL EPH
NJ EPH	SB,LCS,LCSD	DCM	1mL NJEPH	1mL NJEPH
EPH / PAH-L	SB, LCS, LCSD	DCM	1mL EPH	1mL EPH
EPH/TPH	SB, LCS, LCSD	DCM	1mL EPH	1mL EPH
ETPH/ ME4125	SB, LCS, MS, Dup	DCM	1mL DRO	1mL ETPH
TPH *	SB, LCS, Dup	DCM	1mL DRO	1mL ETPH

*** TPH includes the following LIMS Products: TPH-DRO and TPH-DRO-D**

APPENDIX B

ANALYTICAL METHOD SENSITIVITY
AND PROJECT CRITERIA TABLE

Analytical Method Sensitivity and Project Criteria Table

Quality Control Information (incl. MDL's & RL's) provided by Alpha Analytical, Inc. of Westborough, MA

EPH - Soil							
Analytes	**MDL mg/Kg**	**RL mg/Kg**	**LCS/MS % Rec**	**MS/MSD % RPD**	**MCP METHOD 1 S-1/GW-1**	**MCP METHOD 1 S-1/GW-2**	**MCP METHOD 1 S-1/GW-3**
Naphthalene	0.0850	0.34	40-140%	< 25%	4	40	500
2-Methyl-Naphthalene	0.0800	0.34	40-140%	< 25%	0.7	80	300
Acenphthalene	0.104	0.34	40-140%	< 25%	1	600	10
Acenaphthene	0.0940	0.34	40-140%	< 25%	4	1000	1000
Fluorene	0.0860	0.34	40-140%	< 25%	1000	1000	1000
Phenanthrene	0.0750	0.34	40-140%	< 25%	10	500	500
Anthracene	0.106	0.34	40-140%	< 25%	1000	1000	1000
Fluoranthene	0.0790	0.34	40-140%	< 25%	1000	1000	1000
Pyrene	0.0900	0.34	40-140%	< 25%	1000	1000	1000
Benzo(a)Anthracene	0.0850	0.34	40-140%	< 25%	7	7	7
Chrysene	0.0840	0.34	40-140%	< 25%	70	70	70
Benzo(b)Fluoranthene	0.0750	0.34	40-140%	< 25%	7	7	7
Benzo(k)Fluoranthene	0.0970	0.34	40-140%	< 25%	70	70	70
Benzo(a)Pyrene	0.108	0.34	40-140%	< 25%	2	2	2
Indeno(1,2,3-cd)Pyrene	0.0610	0.34	40-140%	< 25%	7	7	7
Dibenzo(a,h)Anthracene	0.0690	0.34	40-140%	< 25%	0.7	0.7	0.7
Benzo(g,h,i)perylene	0.0700	0.34	40-140%	< 25%	1000	1000	1000
c9-c18	N/A	6.67	40-140%	< 25%	1000	1000	1000
c19-c369	N/A	6.67	40-140%	< 25%	3000	3000	3000
c11-c22	N/A	6.67	40-140%	< 25%	1000	1000	1000

Surrogates	**% Recovery**
1-Chloro-Octadecane	40-140%
2-Fluorobiphenyl	40-140%
2-Bromonaphthalene	40-140%
o-Terphenyl	40-140%

EPH - Liquid							
Analytes	**MDL ug/L**	**RL ug/L**	**LCS/MS % Rec**	**MS/MSD % RPD**	**MCP METHOD 1 GW-1**	**MCP METHOD 1 GW-2**	**MCP METHOD 1 GW-3**
Naphthalene	1.37	10	40-140%	< 25%	140	1000	20000
2-Methyl-Naphthalene	1.37	10	40-140%	< 25%	10	2000	20000
Acenphthalene	1.24	10	40-140%	< 25%	30	10000	40
Acenaphthene	1.46	10	40-140%	< 25%	20	-	6000
Fluorene	1.38	10	40-140%	< 25%	30	-	40
Phenanthrene	1.15	10	40-140%	< 25%	40	-	10000
Anthracene	1.22	10	40-140%	< 25%	60	-	30
Fluoranthene	1.13	10	40-140%	< 25%	90	-	200
Pyrene	1.07	10	40-140%	< 25%	80	-	20
Benzo(a)Anthracene	1.16	10	40-140%	< 25%	1	-	1000
Chrysene	1.15	10	40-140%	< 25%	2	-	70
Benzo(b)Fluoranthene	2.40	10	40-140%	< 25%	1	-	400
Benzo(k)Fluoranthene	1.66	10	40-140%	< 25%	1	-	100
Benzo(a)Pyrene	1.54	10	40-140%	< 25%	0.2	-	500
Indeno(1,2,3-cd)Pyrene	1.96	10	40-140%	< 25%	0.5	-	100
Dibenzo(a,h)Anthracene	1.74	10	40-140%	< 25%	0.5	-	40
Benzo(g,h,i)perylene	2.04	10	40-140%	< 25%	50	-	20
c9-c18	N/A	100	40-140%	< 25%	700	5000	50000
c19-c369	N/A	100	40-140%	< 25%	14000	-	50000
c11-c22	N/A	100	40-140%	< 25%	200	50000	5000

Surrogates	**% Recovery**
1-Chloro-Octadecane	40-140%
2-Fluorobiphenyl	40-140%
2-Bromonaphthalene	40-140%
o-Terphenyl	40-140%

EPH/PAH-SIM - Soil							
Analytes	MDL mg/Kg	RL mg/Kg	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
2-Methyl-Naphthalene	0.00827	0.027	40-140%	< 25%	0.7	80	300
Acenaphthene	0.00791	0.027	40-140%	< 25%	4	1000	1000
Acenphthalene	0.00815	0.027	40-140%	< 25%	1	600	10
Anthracene	0.00753	0.027	40-140%	< 25%	1000	1000	1000
Benzo(a)Anthracene	0.00627	0.027	40-140%	< 25%	7	7	7
Benzo(a)Pyrene	0.00669	0.027	40-140%	< 25%	2	2	2
Benzo(b)Fluoranthene	0.00767	0.027	40-140%	< 25%	7	7	7
Benzo(g,h,i)perylene	0.00864	0.027	40-140%	< 25%	1000	1000	1000
Benzo(k)Fluoranthene	0.00724	0.027	40-140%	< 25%	70	70	70
Chrysene	0.00853	0.027	40-140%	< 25%	70	70	70
Dibenzo(a,h)Anthracene	0.00838	0.027	40-140%	< 25%	0.7	0.7	0.7
Fluoranthene	0.00791	0.027	40-140%	< 25%	1000	1000	1000
Fluorene	0.00859	0.027	40-140%	< 25%	1000	1000	1000
Indeno(1,2,3-cd)Pyrene	0.00808	0.027	40-140%	< 25%	7	7	7
Naphthalene	0.00747	0.027	40-140%	< 25%	4	40	500
Phenanthrene	0.00767	0.027	40-140%	< 25%	10	500	500
Pyrene	0.00832	0.027	40-140%	< 25%	1000	1000	1000

Surrogates	% Recovery
o-Terphenyl	40-140%

EPH/PAH SIM - Liquid							
Analytes	MDL ug/L	RL ug/L	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 GW-1	MCP METHOD 1 GW-2	MCP METHOD 1 GW-3
2-Methyl-Naphthalene	0.108	0.4	40-140%	< 25%	10	2000	20000
Acenaphthene	0.125	0.4	40-140%	< 25%	20	-	6000
Acenphthalene	0.124	0.4	40-140%	< 25%	30	10000	40
Anthracene	0.116	0.4	40-140%	< 25%	60	-	30
Benzo(a)Anthracene	0.113	0.4	40-140%	< 25%	1	-	1000
Benzo(a)Pyrene	0.129	0.4	40-140%	< 25%	0.2	-	500
Benzo(b)Fluoranthene	0.115	0.4	40-140%	< 25%	1	-	400
Benzo(g,h,i)perylene	0.138	0.4	40-140%	< 25%	50	-	20
Benzo(k)Fluoranthene	0.120	0.4	40-140%	< 25%	1	-	100
Chrysene	0.131	0.4	40-140%	< 25%	2	-	70
Dibenzo(a,h)Anthracene	0.118	0.4	40-140%	< 25%	0.5	-	40
Fluoranthene	0.120	0.4	40-140%	< 25%	90	-	200
Fluorene	0.122	0.4	40-140%	< 25%	30	-	40
Indeno(1,2,3-cd)Pyrene	0.121	0.4	40-140%	< 25%	0.5	-	100
Naphthalene	0.134	0.4	40-140%	< 25%	140	1000	20000
Phenanthrene	0.125	0.4	40-140%	< 25%	40	-	10000
Pyrene	0.121	0.4	40-140%	< 25%	80	-	20

Surrogates	% Recovery
o-Terphenyl	40-140%

VPH - Soil							
Analytes	**MDL mg/Kg**	**RL mg/Kg**	**LCS/MS % Rec / RPD**	**MS/MSD %Rec/RPD**	**MCP METHOD 1 S-1/GW-1**	**MCP METHOD 1 S-1/GW-2**	**MCP METHOD 1 S-1/GW-3**
Methyl tert butyl ether	0.0173	0.05	70-130 % /< 25%	70-130 % /< 50%	0.1	100	100
Benzene	0.0109	0.1	70-130 % /< 25%	70-130 % /< 50%	2	30	30
Toluene	0.00747	0.1	70-130 % /< 25%	70-130 % /< 50%	30	500	500
Ethylbenzene	0.0116	0.1	70-130 % /< 25%	70-130 % /< 50%	40	500	500
p/m-Xylene	0.0223	0.1	70-130 % /< 25%	70-130 % /< 50%	400	300	500
o-Xylene	0.00920	0.1	70-130 % /< 25%	70-130 % /< 50%	400	300	500
1,2,4-Trimethylbenzene	0.0210	0.1	70-130 % /< 25%	70-130 % /< 50%	-	-	-
Naphthalene	0.0189	0.5	70-130 % /< 25%	70-130 % /< 50%	4	40	500
C9-C10 Aromatics	N/A	2.5	70-130 % /< 25%	70-130 % /< 50%	100	100	100
C5-C8 Aliphatics	N/A	2.5	70-130 % /< 25%	70-130 % /< 50%	100	100	100
C9-C12 Aliphatics	N/A	2.5	70-130 % /< 25%	70-130 % /< 50%	1000	1000	1000

Surrogates	**% Recovery**
2,5-Dibromotoluene	70-130%

VPH - Liquid							
Analytes	**MDL ug/L**	**RL ug/L**	**LCS/MS % Rec / RPD**	**MS/MSD %Rec/RPD**	**MCP METHOD 1 GW-1**	**MCP METHOD 1 GW-2**	**MCP METHOD 1 GW-3**
Methyl tert butyl ether	0.280	3	70-130 % /< 25%	70-130 % /< 50%	70	50000	50000
Benzene	0.214	2	70-130 % /< 25%	70-130 % /< 50%	5	2000	10000
Toluene	0.15	2	70-130 % /< 25%	70-130 % /< 50%	1000	50000	40000
Ethylbenzene	0.232	2	70-130 % /< 25%	70-130 % /< 50%	700	20000	5000
p/m-Xylene	0.445	2	70-130 % /< 25%	70-130 % /< 50%	10000	9000	5000
o-Xylene	0.279	2	70-130 % /< 25%	70-130 % /< 50%	10000	9000	5000
1,2,4-Trimethylbenzene	0.226	2	70-130 % /< 25%	70-130 % /< 50%	-	-	-
Naphthalene	0.377	10	70-130 % /< 25%	70-130 % /< 50%	140	1000	20000
C9-C10 Aromatics	N/A	50	70-130 % /< 25%	70-130 % /< 50%	200	7000	50000
C5-C8 Aliphatics	N/A	50	70-130 % /< 25%	70-130 % /< 50%	300	3000	50000
C9-C12 Aliphatics	N/A	50	70-130 % /< 25%	70-130 % /< 50%	700	5000	50000

Surrogates	**% Recovery**
2,5-Dibromotoluene	70-130%

VOCs in Soil - Low EPA 8260B							
Analytes	MDL mg/Kg	RL mg/Kg	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
Acetone	3.23E-03	0.01		< 30%	6	50	400
Acrylonitrile	3.76E-04	0.01		< 30%	-	-	-
Benzene	1.29E-04	0.001	66-142%	< 30%	2	30	30
Bromobenzene	2.01E-04	0.005		< 30%	-	-	-
Bromochloromethane	3.02E-04	0.005		< 30%	-	-	-
Bromodichloromethane	2.29E-04	0.001		< 30%	0.1	0.1	20
Bromoform	4.15E-04	0.004		< 30%	0.1	1	200
Bromomethane	6.48E-04	0.002		< 30%	0.5	0.5	30
Carbon disulfide	1.49E-04	0.01		< 30%	-	-	-
Carbon tetrachloride	1.90E-04	0.001		< 30%	10	5	10
Chlorobenzene	3.48E-04	0.001	60-133%	< 30%	1	3	100
Chlorodibromomethane	3.08E-04	0.001		< 30%	-	-	-
Chloroethane	4.38E-04	0.002		< 30%	-	-	-
Chloroform	3.70E-04	0.0015		< 30%	0.4	0.3	400
Chloromethane	7.83E-04	0.005		< 30%	-	-	-
cis-1,2-Dichloroethene	2.56E-04	0.001		< 30%	0.3	0.4	100
cis-1,3-Dichloropropene	2.67E-04	0.001		< 30%	0.01	0.4	9
Dibromomethane	4.35E-04	0.01		< 30%	-	-	-
Dichlorodifluoromethane	3.17E-04	0.01		< 30%	-	-	-
Ethyl benzene	1.50E-04	0.001		< 30%	40	500	500
ethyl ether	3.80E-04	0.005		< 30%	-	-	-
Ethyl-methacrylate	6.39E-04	0.001		< 30%	-	-	-
Hexachlorobutadiene	4.22E-04	0.005		< 30%	6	6	6
Isopropylbenzene	1.68E-04	0.001		< 30%	-	-	-
Methylene chloride	8.16E-04	0.002		< 30%	0.1	20	200
Methyl-tert-butyl ether	4.87E-04	0.01		< 30%	0.1	100	100
Naphthalene	7.70E-04	0.005		< 30%	4	40	500
n-Butylbenzene	1.98E-04	0.001		< 30%	-	-	-
n-Propylbenzene	1.88E-04	0.001		< 30%	-	-	-
o-Xylene	2.71E-04	0.002		< 30%	400	300	500
p/m-Xylene	3.23E-04	0.002		< 30%	400	300	500
p-Isopropyltoluene	1.91E-04	0.001		< 30%	-	-	-
sec-Butylbenzene	2.06E-04	0.001		< 30%	-	-	-
Styrene	5.52E-04	0.002		< 30%	3	4	30
tert-Butylbenzene	5.61E-04	0.005		< 30%	-	-	-
Tetrachloroethene	1.60E-04	0.001		< 30%	1	10	30
Tetrahydrofuran	3.40E-04	0.02		< 30%	-	-	-
Toluene	1.75E-04	0.0015	59-139%	< 30%	30	500	500
trans-1,2-Dichloroethene	1.78E-04	0.0015		< 30%	1	1	500
trans-1,3-Dichloropropene	1.43E-04	0.001		< 30%	0.01	0.4	9
trans-1,4-Dichloro-2-butene	1.48E-03	0.005		< 30%	-	-	-
Trichloroethene	1.87E-04	0.001	62-137%	< 30%	0.3	2	90
Trichlorofluoromethane	2.31E-04	0.005		< 30%	-	-	-
Vinyl Acetate	8.85E-04	0.01		< 30%	-	-	-
Vinyl chloride	3.61E-04	0.002		< 30%	0.6	0.6	0.6
1,1-Dichloroethane	2.06E-04	0.01		< 30%	0.4	5	500
1,1-Dichloroethene	1.78E-04	0.001	59-172%	< 30%	3	40	500
1,1-Dichloropropene	4.56E-04	0.005		< 30%	-	-	-
1,1,1-Trichloroethane	1.93E-04	0.001		< 30%	30	500	500
1,1,2-Trichloroethane	2.48E-04	0.0015		< 30%	0.1	2	4
1,1,1,2-Tetrachloroethane	3.18E-04	0.001		< 30%	0.1	0.1	7
1,1,2,2-Tetrachloroethane	2.40E-04	0.001		< 30%	0.005	0.02	0.8
1,2-Dibromo-3-chloropropane	8.37E-04	0.005		< 30%	-	-	-
1,2-Dibromoethane	2.11E-04	0.004		< 30%	0.1	0.1	0.7
1,2-Dichlorobenzene	3.64E-04	0.005		< 30%	9	30	300
1,2-Dichloroethane	2.07E-04	0.001		< 30%	0.1	0.1	10
1,2-Dichloropropane	2.33E-04	0.0035		< 30%	0.1	0.1	10
1,2,3-Trichlorobenzene	4.03E-04	0.005		< 30%	-	-	-
1,2,3-Trichloropropane	3.87E-04	0.01		< 30%	-	-	-
1,2,4-Trichlorobenzene	7.90E-04	0.005		< 30%	2	70	500
1,2,4-Trimethylbenzene	5.73E-04	0.005		< 30%	-	-	-
1,3-Dichlorobenzene	2.25E-04	0.005		< 30%	1	40	100
1,3-Dichloropropane	1.73E-04	0.005		< 30%	-	-	-
1,3,5-Trimethylbenzene	1.64E-04	0.005		< 30%	-	-	-
1,4-Dichlorobenzene	3.01E-04	0.005		< 30%	0.7	4	50
1,4-Dichloro-2-butane	1.20E-04	0.01		< 30%	-	-	-
2-Butanone	5.00E-04	0.01		< 30%	4	50	400
2-Chlorotoluene	3.13E-04	0.005		< 30%	-	-	-
2,2-Dichloropropene	7.67E-04	0.005		< 30%	-	-	-
4-Chlorotoluene	2.08E-04	0.005		< 30%	-	-	-
4-methyl-2-pentanone	4.54E-04	0.01		< 30%	0.4	50	400

Non-Standard Compounds							
1,2,4,5-tetramethylbenzene	9.05E-04	0.001		< 30%	-	-	-
1,4-Dioxane	1.74E-02	0.1		< 30%	0.2	6	70
2-Chloroethylvinyl ether	6.16E-04	0.005		< 30%	-	-	-
2-Hexanone	3.96E-04	0.01		< 30%	-	-	-
4-ethyltoluene	4.85E-04	0.001		< 30%	-	-	-
Acrolein	3.01E-03	0.025		< 30%	-	-	-
cyclohexane	6.25E-04	0.005		< 30%	-	-	-
Diisopropyl ether	1.49E-04	0.004		< 30%	-	-	-
Ethyl Acetate	1.28E-04	0.001		< 30%	-	-	-
Ethyl-tert-butyl ether	4.23E-04	0.004		< 30%	-	-	-
Freon-113	2.15E-04	0.02		< 30%	-	-	-
Halothane	1.50E-04	0.005		< 30%	-	-	-
Iodomethane	1.27E-03	0.01		< 30%	-	-	-
Methyl acetate	4.66E-04	0.01		< 30%	-	-	-
methyl cyclohexane	6.99E-04	0.0035		< 30%	-	-	-
p-diethylbenzene	1.00E-03	0.001		< 30%	-	-	-
Tert-Butyl Alcohol	6.42E-04	0.06		< 30%	-	-	-
Tertiary-amyl methyl ether	5.76E-04	0.004		< 30%	-	-	-

Surrogates	% Recovery
dibromofluoromethane	70-130%
1,2-dichloroethane-d4	70-130%
toluene-d8	70-130%
4-bromofluorobenzene	70-130%

VOCs in Soil - High EPA 8260B							
Analytes	MDL* ug/Kg	RL* ug/Kg	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
Acetone	1.62E-01	0.5		< 30%	6	50	400
Acrylonitrile	6.01E-02	0.2		< 30%	-	-	-
Benzene	9.62E-03	0.05	66-142%	< 30%	2	30	30
Bromobenzene	1.66E-02	0.25		< 30%	-	-	-
Bromochloromethane	1.79E-02	0.25		< 30%	-	-	-
Bromodichloromethane	1.92E-02	0.05		< 30%	0.1	0.1	20
Bromoform	5.58E-02	0.2		< 30%	0.1	1	200
Bromomethane	2.91E-02	0.1		< 30%	0.5	0.5	30
Carbon disulfide	1.28E-02	0.5		< 30%	-	-	-
Carbon tetrachloride	1.39E-02	0.05		< 30%	10	5	10
Chlorobenzene	1.23E-02	0.05	60-133%	< 30%	1	3	100
Chlorodibromomethane	1.60E-02	0.05		< 30%	-	-	-
Chloroethane	2.20E-02	0.1		< 30%	-	-	-
Chloroform	1.62E-02	0.075		< 30%	0.4	0.3	400
Chloromethane	3.92E-02	0.25		< 30%	-	-	-
cis-1,2-Dichloroethene	1.28E-02	0.05		< 30%	0.3	0.4	100
cis-1,3-Dichloropropene	1.34E-02	0.05		< 30%	0.01	0.4	9
Dibromomethane	2.17E-02	0.5		< 30%	-	-	-
Dichlorodifluoromethane	8.66E-02	0.5		< 30%	-	-	-
Ethyl benzene	1.90E-02	0.05		< 30%	40	500	500
Ethyl ether	1.80E-02	0.25		< 30%	-	-	-
Ethyl methacrylate	7.36E-02	0.5		< 30%	-	-	-
Hexachlorobutadiene	2.11E-02	0.25		< 30%	6	6	6
Isopropylbenzene	9.66E-03	0.05		< 30%	-	-	-
Methylene chloride	2.28E-02	0.5		< 30%	0.1	20	200
Methyl-tert-butyl ether	5.71E-02	0.1		< 30%	0.1	100	100
Naphthalene	3.30E-02	0.25		< 30%	4	40	500
n-Butylbenzene	4.11E-02	0.05		< 30%	-	-	-
n-Propylbenzene	9.99E-03	0.05		< 30%	-	-	-
o-Xylene	1.17E-02	0.1		< 30%	400	300	500
p/m-Xylene	2.85E-02	0.1		< 30%	400	300	500
p-Isopropyltoluene	9.75E-03	0.05		< 30%	-	-	-
sec-Butylbenzene	1.06E-02	0.05		< 30%	-	-	-
Styrene	3.07E-02	0.1		< 30%	3	4	30
tert-Butylbenzene	2.80E-02	0.25		< 30%	-	-	-
Tetrachloroethene	1.45E-02	0.05		< 30%	1	10	30
Tetrahydrofuran	5.64E-02	1		< 30%	-	-	-
Toluene	9.49E-03	0.075	59-139%	< 30%	30	500	500

trans-1,2-Dichloroethene	1.50E-02	0.075		< 30%	1	1	500
trans-1,3-Dichloropropene	1.68E-02	0.05		< 30%	0.01	0.4	9
trans-1,4-Dichloro-2-butene	7.39E-02	0.25		< 30%	-	-	-
Trichloroethene	1.41E-02	0.05	62-137%	< 30%	0.3	2	90
Trichlorofluoromethane	2.18E-02	0.25		< 30%	-	-	-
Vinyl acetate	6.83E-02	0.5		< 30%	-	-	-
Vinyl chloride	2.77E-02	0.1		< 30%	0.6	0.6	0.6
1,1-Dichloroethane	1.18E-02	0.075		< 30%	0.4	5	500
1,1-Dichloroethene	1.66E-02	0.05	59-172%	< 30%	3	40	500
1,1-Dichloropropene	2.28E-02	0.25		< 30%	-	-	-
1,1,1-Trichloroethane	1.02E-02	0.05		< 30%	30	500	500
1,1,2-Trichloroethane	2.05E-02	0.075		< 30%	0.1	2	4
1,1,1,2-Tetrachloroethane	1.64E-02	0.05		< 30%	0.1	0.1	7
1,1,2,2-Tetrachloroethane	1.45E-02	0.05		< 30%	0.005	0.02	0.8
1,2-Dibromo-3-chloropropane	7.41E-02	0.25		< 30%	-	-	-
1,2-Dibromoethane	1.07E-02	0.2		< 30%	0.1	0.1	0.7
1,2-Dichlorobenzene	1.82E-02	0.25		< 30%	9	30	300
1,2-Dichloroethane	1.47E-02	0.05		< 30%	0.1	0.1	10
1,2-Dichloropropane	1.26E-02	0.18		< 30%	0.1	0.1	10
1,2,3-Trichlorobenzene	4.62E-02	0.25		< 30%	-	-	-
1,2,3-Trichloropropane	2.09E-02	0.5		< 30%	-	-	-
1,2,4-Trichlorobenzene	4.35E-02	0.25		< 30%	2	70	500
1,2,4-Trimethylbenzene	7.63E-02	0.25		< 30%	-	-	-
1,3-Dichlorobenzene	1.88E-02	0.25		< 30%	1	40	100
1,3-Dichloropropane	1.17E-02	0.25		< 30%	-	-	-
1,3,5-Trimethylbenzene	6.86E-02	0.25		< 30%	-	-	-
1,4-Dichlorobenzene	1.53E-02	0.25		< 30%	0.7	4	50
1,4-Dichlorobutane	3.92E-02	0.5		< 30%	-	-	-
2-Butanone	1.94E-01	0.5		< 30%	4	50	400
2-Chlorotoluene	1.56E-02	0.25		< 30%	-	-	-
2,2-Dichloropropane	6.06E-02	0.25		< 30%	-	-	-
4-Chlorotoluene	1.42E-02	0.25		< 30%	-	-	-
4-Methyl-2-pentanone	8.84E-02	0.5		< 30%	0.4	50	400
2-Hexanone	6.30E-02	0.5		< 30%	-	-	-
Non-Standard Compounds							
1,4-Dioxane	8.70E-01	5		< 30%	0.2	6	70
2-Chloroethylvinyl ether	1.56E-02	1		< 30%	-	-	-
4-ethyltoluene	2.43E-02	0.05		< 30%	-	-	-
Acrolein	1.50E-01	1.2		< 30%	-	-	-
Diisopropyl ether	4.77E-02	0.2		< 30%	-	-	-
Ethyl-Tert-Butyl-Ether	4.38E-02	0.2		< 30%	-	-	-
Freon-113	4.66E-02	0.2		< 30%	-	-	-
Iodomethane	6.33E-02	0.5		< 30%	-	-	-
Tert-Butyl Alcohol	6.25E-02	0.5		< 30%	-	-	-
Tertiary-Amyl Methyl Ether	5.05E-02	0.2		< 30%	-	-	-

Surrogates	**% Recovery**
dibromofluoromethane	70-130%
1,2-dichloroethane-d4	70-130%
toluene-d8	70-130%
4-bromofluorobenzene	70-130%
Surrogates	**% Recovery**
dibromofluoromethane	70-130%
1,2-dichloroethane-d4	70-130%
toluene-d8	70-130%
4-bromofluorobenzene	70-130%

* Multiplier for Medium/High-Level VOC MDLs and RLs is 50x Low-Level MDLs and RLs

SVOCs in soil EPA 8270C							
Analytes	MDL mg/Kg	RL mg/Kg	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
1,2,4,5-Tetrachlorobenzene	0.110	0.333	40-140%	< 50%	-	-	-
1,2,4-Trichlorobenzene	0.099	0.333	38-107%	< 50%	2	70	500
1,2-Dichlorobenzene	0.077	0.333	40-140%	< 50%	9	30	300
1,3-Dichlorobenzene	0.104	0.333	40-140%	< 50%	1	40	100
1,4-Dichlorobenzene	0.068	0.333	28-104%	< 50%	0.7	4	50
1-Methylnaphthalene	0.124	0.333	40-140%	< 50%	-	-	-
2,4,5-Trichlorophenol	0.092	0.333	30-130%	< 50%	-	-	-
2,4,6-Trichlorophenol	0.104	0.333	30-130%	< 50%	-	-	-
2,4-Dichlorophenol	0.237	0.67	30-130%	< 50%	-	-	-
2,4-Dimethylphenol	0.190	0.333	30-130%	< 50%	-	-	-
2,4-Dinitrophenol	1.240	3	4-130%	< 50%	-	-	-
2,4-Dinitrotoluene	0.105	0.333	28-89%	< 50%	-	-	-
2,6-Dinitrotoluene	0.117	0.333	40-140%	< 50%	-	-	-
2-Chloronaphthalene	0.105	0.4	40-140%	< 50%	-	-	-
2-Chlorophenol	0.118	0.4	25-102%	< 50%	-	-	-
2-Methylnaphthalene	0.113	0.333	40-140%	< 50%	0.7	80	300
2-Methylphenol	0.287	0.4	30-130%	< 50%	-	-	-
2-Nitroaniline	0.075	0.333	40-140%	< 50%	-	-	-
2-Nitrophenol	0.129	1.3	30-130%	< 50%	-	-	-
3,3'-Dichlorobenzidine	0.126	0.67	30-140%	< 50%	-	-	-
3-Methylphenol/4-Methyphen	0.185	0.4	30-130%	< 50%	-	-	-
3-Nitroaniline	0.161	0.333	40-140%	< 50%	-	-	-
4,6-Dinitro-o-cresol	0.149	1.3	30-130%	< 50%	-	-	-
4-Bromophenyl phenyl ether	0.102	0.333	40-140%	< 50%	-	-	-
4-Chloroaniline	0.170	0.333	30-140%	< 50%	-	-	-
4-Chlorophenyl phenyl	0.092	0.333	40-140%	< 50%	-	-	-
4-Nitroaniline	0.116	0.47	40-140%	< 50%	-	-	-
4-Nitrophenol	0.441	0.67	11-114%	< 50%	-	-	-
Acenaphthene	0.103	0.333	31-137%	< 50%	4	1000	1000
Acenaphthylene	0.211	0.333	40-140%	< 50%	1	600	10
Acetophenone	0.105	1.3	40-140%	< 50%	-	-	-
Aniline	0.173	0.67	30-140%	< 50%	-	-	-
Anthracene	0.115	0.333	40-140%	< 50%	1000	1000	1000
Azobenzene	0.114	0.333	40-140%	< 50%	-	-	-
Benzidine	0.543	3.3	30-140%	< 50%	-	-	-
Benzo(a)anthracene	0.070	0.333	40-140%	< 50%	7	7	7
Benzo(a)pyrene	0.087	0.333	40-140%	< 50%	2	2	2
Benzo(b)fluoranthene	0.082	0.333	40-140%	< 50%	7	7	7
Benzo(ghi)perylene	0.144	0.333	40-140%	< 50%	1000	1000	1000
Benzo(k)fluoranthene	0.078	0.333	40-140%	< 50%	70	70	70
Benzoic acid	1.349	3.3	40-140%	< 50%	-	-	-
Benzyl alcohol	0.091	0.67	40-140%	< 50%	-	-	-
Biphenyl	0.095	0.333	40-140%	< 50%	-	-	-
Bis(2-chloroethoxy)methane	0.098	0.333	40-140%	< 50%	-	-	-
Bis(2-chloroethyl)ether	0.103	0.333	40-140%	< 50%	-	-	-
Bis(2-chloroisopropyl)ether	0.107	0.333	40-140%	< 50%	-	-	-
Bis(2-ethylhexyl)phthalate	0.179	0.67	40-140%	< 50%	-	-	-
Butyl benzyl phthalate	0.114	0.333	40-140%	< 50%	-	-	-
Carbazole	0.089	0.333	40-140%	< 50%	-	-	-
Chrysene	0.100	0.333	40-140%	< 50%	70	70	70
Dibenzo(a,h)anthracene	0.116	0.2	40-140%	< 50%	0.7	0.7	0.7
Dibenzofuran	0.100	0.333	40-140%	< 50%	-	-	-
Diethyl phthalate	0.092	0.333	40-140%	< 50%	-	-	-
Dimethyl phthalate	0.099	0.333	40-140%	< 50%	-	-	-
Di-n-butylphthalate	0.117	0.333	40-140%	< 50%	-	-	-
Di-n-octylphthalate	0.072	0.333	40-140%	< 50%	-	-	-
Fluoranthene	0.096	0.333	40-140%	< 50%	1000	1000	1000
Fluorene	0.093	0.333	40-140%	< 50%	1000	1000	1000
Hexachlorobenzene	0.092	0.333	40-140%	< 50%	-	-	-
Hexachlorobutadiene	0.144	0.67	40-140%	< 50%	6	6	6
Hexachlorocyclopentadiene	0.358	0.67	40-140%	< 50%	-	-	-
Hexachloroethane	0.119	0.333	40-140%	< 50%	-	-	-
Indeno(1,2,3-cd)pyrene	0.129	0.333	40-140%	< 50%	7	7	7
Isophorone	0.085	0.333	40-140%	< 50%	-	-	-
Naphthalene	0.102	0.333	40-140%	< 50%	4	40	500
NDPA/DPA	0.233	1	40-140%	< 50%	-	-	-
Nitrobenzene	0.113	0.333	40-140%	< 50%	-	-	-
n-Nitrosodimethylamine	0.104	3.3	30-140%	< 50%	-	-	-
n-Nitrosodi-n-propylamine	0.131	0.333	41-126%	< 50%	-	-	-
p-Chloro-m-cresol	0.059	0.333	26-103%	< 50%	-	-	-
Pentachlorophenol	0.252	1.3	17-109%	< 50%	-	-	-
Phenanthrene	0.097	0.333	40-140%	< 50%	10	500	500

Phenol	0.119	0.47	28-90%	< 50%	-	-	-
Pyrene	0.085	0.333	35-142%	< 50%	1000	1000	1000
Pyridine	0.405	3.3	30-140%	< 50%	-	-	-

Surrogates	% Recovery
2-Fluorophenol	25-120%
Phenol-d6	10-120%
Nitrobenzene-d5	23-120%
2-Fluorobiphenyl	30-120%
2,4,6-Tribromophenol	0-136%
4-Terphenyl-d14	18-120%

SVOCs in liquid EPA 8270C / EPA 625							
Analytes	MDL ug/L	RL ug/L	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 GW-1	MCP METHOD 1 GW-2	MCP METHOD 1 GW-3
1,2,4,5-Tetrachlorobenzene	1.85	20	40-140%	< 30%	-	-	-
1,2,4-Trichlorobenzene	1.92	5	39-98%	< 30%	70	2000	50000
1,2-Dichlorobenzene	1.78	5	40-140%	< 30%	600	2000	2000
1,3-Dichlorobenzene	1.41	5	40-140%	< 30%	40	2000	50000
1,4-Dichlorobenzene	1.55	5	36-97%	< 30%	5	200	8000
2,4,5-Trichlorophenol	1.48	5	30-130%	< 30%	-	-	-
2,4,6-Trichlorophenol	1.63	5	30-130%	< 30%	-	-	-
2,4-Dichlorophenol	1.60	10	30-130%	< 30%	-	-	-
2,4-Dimethylphenol	1.15	10	30-130%	< 30%	-	-	-
2,4-Dinitrophenol	7.77	30	30-130%	< 30%	-	-	-
2,4-Dinitrotoluene	1.64	6	24-96%	< 30%	-	-	-
2,6-Dinitrotoluene	1.54	5	40-140%	< 30%	-	-	-
2-Chloronaphthalene	1.53	6	40-140%	< 30%	-	-	-
2-Chlorophenol	1.59	6	27-123%	< 30%	-	-	-
2-Methylnaphthalene	1.57	5	40-140%	< 30%	10	2000	20000
2-Methylphenol	2.35	6	30-130%	< 30%	-	-	-
2-Nitroaniline	1.61	5		< 30%	-	-	-
2-Nitrophenol	1.74	20	30-130%	< 30%	-	-	-
3,3'-Dichlorobenzidine	4.78	50	40-140%	< 30%	-	-	-
3-Methylphenol/4-Methylpher	2.03	6	30-130%	< 30%	-	-	-
3-Nitroaniline	1.91	5		< 30%	-	-	-
4,6-Dinitro-o-cresol	7.82	20		< 30%	-	-	-
4-Bromophenyl phenyl ether	1.03	5	40-140%	< 30%	-	-	-
4-Chloroaniline	1.64	5	40-140%	< 30%	-	-	-
4-Chlorophenyl phenyl ether	1.21	5	40-140%	< 30%	-	-	-
4-Nitroaniline	2.05	7		< 30%	-	-	-
4-Nitrophenol	1.78	10	10-80%	< 30%	-	-	-
Acenaphthene	1.31	5	46-118%	< 30%	20	-	6000
Acenaphthylene	1.40	5	40-140%	< 30%	30	10000	40
Acetophenone	3.35	20	40-140%	< 30%	-	-	-
Aniline	0.992	20	40-140%	< 30%	-	-	-
Anthracene	1.25	5	40-140%	< 30%	60	-	30
Azobenzene	1.11	5	40-140%	< 30%	-	-	-
Benzidine	11.9	50		< 30%	-	-	-
Benzo(a)anthracene	0.661	5	40-140%	< 30%	1	-	1000
Benzo(a)pyrene	0.869	5	40-140%	< 30%	0.2	-	500
Benzo(b)fluoranthene	0.891	5	40-140%	< 30%	1	-	400
Benzo(ghi)perylene	1.45	5	40-140%	< 30%	50	-	20
Benzo(k)fluoranthene	0.805	5	40-140%	< 30%	1	-	100
Benzoic acid	4.52	50		< 30%	-	-	-
Benzyl Alcohol	2.85	10		< 30%	-	-	-
Biphenyl	1.60	5		< 30%	-	-	-
Bis(2-chloroethoxy)methane	1.67	5	40-140%	< 30%	-	-	-
Bis(2-chloroethyl)ether	1.35	5	40-140%	< 30%	-	-	-
Bis(2-chloroisopropyl)ether	1.64	5	40-140%	< 30%	-	-	-
Bis(2-ethylhexyl)phthalate	0.834	5	40-140%	< 30%	-	-	-
Butyl benzyl phthlate	1.73	5	40-140%	< 30%	-	-	-
Carbazole	1.41	5		< 30%	-	-	-
Chrysene	0.817	5	40-140%	< 30%	2	-	70
Dibenzo(a,h)anthracene	0.886	5	40-140%	< 30%	0.5	-	40
Dibenzofuran	1.39	5	40-140%	< 30%	-	-	-
Diethyl phthalate	0.95	5	40-140%	< 30%	-	-	-
Dimethyl phthalate	1.05	5	40-140%	< 30%	-	-	-
Di-n-butylphthalate	1.05	5	40-140%	< 30%	-	-	-
Di-n-octylphthalate	0.852	5	40-140%	< 30%	-	-	-
Fluoranthene	1.16	5	40-140%	< 30%	90	-	200
Fluorene	1.11	5	40-140%	< 30%	30	-	40
Hexachlorobenzene	1.31	5	40-140%	< 30%	-	-	-
Hexachlorobutadiene	2.09	10	40-140%	< 30%	0.6	1	3000

Hexachlorocyclopentadiene	6.51	30	40-140%	< 30%	-	-	-
Hexachloroethane	1.91	5	40-140%	< 30%	-	-	-
Indeno(1,2,3-cd)pyrene	1.27	7	40-140%	< 30%	0.5	-	100
Isophorone	1.90	5	40-140%	< 30%	-	-	-
Naphthalene	1.49	5	40-140%	< 30%	140	1000	20000
NDPA/DPA	4.54	15		< 30%	-	-	-
Nitrobenzene	1.61	5	40-140%	< 30%	-	-	-
n-Nitrosodimethylamine	1.02	50	40-140%	< 30%	-	-	-
n-Nitrosodi-n-propylamine	1.95	5	40-140%	< 30%	-	-	-
p-Chloro-m-cresol	1.34	5	23-97%	< 30%	-	-	-
Pentachlorophenol	4.91	15	9-103%	< 30%	-	-	-
Phenanthrene	0.868	5	40-140%	< 30%	40	-	10000
Phenol	0.786	7	12-110%	< 30%	-	-	-
Pyrene	1.26	5	26-127%	< 30%	80	-	20
Pyridine	10.0	50		< 30%	-	-	-

Surrogates	**% Recovery**
2-Fluorophenol	21-120%
Phenol-d6	10-120%
Nitrobenzene-d5	23-120%
2-Fluorobiphenyl	15-120%
2,4,6-Tribromophenol	10-120%
4-Terphenyl-d14	33-120%

SVOCs in Soil EPA 8270CSIM							
PAHs - Analytes	MDL mg/Kg	RL mg/Kg	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
Acenaphthene	2.81E-03	0.013	31-137%	< 50%	4	1000	1000
Acenaphthylene	2.94E-03	0.013		< 50%	1	600	10
Anthracene	2.63E-03	0.013	40-140%	< 50%	1000	1000	1000
Benzo (a) anthracene	2.16E-03	0.013		< 50%	7	7	7
Benzo (a) pyrene	3.68E-03	0.013		< 50%	2	2	2
Benzo (b) fluoranthene	2.91E-03	0.013		< 50%	7	7	7
Benzo (ghi) perylene	2.91E-03	0.013		< 50%	1000	1000	1000
Benzo (k) fluoranthene	1.33E-02	0.013		< 50%	70	70	70
Chrysene	3.22E-03	0.013		< 50%	70	70	70
Dibenzo (a,h) anthracene	2.31E-03	0.013		< 50%	0.7	0.7	0.7
Fluoranthene	1.98E-03	0.013	40-140%	< 50%	1000	1000	1000
Fluorene	3.45E-03	0.013		< 50%	1000	1000	1000
Indeno (1,2,3-cd) pyrene	2.87E-03	0.013		< 50%	7	7	7
Naphthalene	3.77E-03	0.013		< 50%	4	40	500
Phenanthrene	2.95E-03	0.013		< 50%	10	500	500
Pyrene	2.81E-03	0.013	35-142%	< 50%	1000	1000	1000
1-Methylnaphthalene	1.99E-03	0.013		< 50%	-	-	-
2-Chloronaphthalene	3.10E-03	0.013	40-140%	< 50%	-	-	-
2-Methylnaphthalene	4.09E-03	0.013		< 50%	0.7	80	300
Additional - Analytes							
Hexachlorobutadiene	2.81E-03	0.033		< 50%	6	6	6
Pentachlorophenol	5.33E-02	0.053	17-109%	< 50%	-	-	-
Hexachlorobenzene	2.78E-03	0.053		< 50%	-	-	-
Hexachloroethane	3.00E-03	0.053		< 50%	-	-	-

Surrogates	% Recovery
2-Fluorophenol	25-120%
Phenol-d6	10-120%
Nitrobenzene-d5	23-120%
2-Fluorobiphenyl	30-120%
2,4,6-Tribromophenol	19-120%
4-Terphenyl-d14	18-120%

SVOCs in Liquid EPA 8270CSIM							
PAHs - Analytes	MDL ug/L	RL ug/L	LCS/MS % Rec	MS/MSD % RPD	MCP METHOD 1 GW-1	MCP METHOD 1 GW-2	MCP METHOD 1 GW-3
Acenaphthene	0.064	0.2	37-111%	< 40%	20	-	6000
Acenaphthylene	0.05	0.2		< 40%	30	10000	40
Anthracene	0.063	0.2	40-140%	< 40%	60	-	30
Benzo (a) anthracene	0.057	0.2		< 40%	1	-	1000
Benzo (a) pyrene	0.069	0.2		< 40%	0.2	-	500
Benzo (b) fluoranthene	0.071	0.2		< 40%	1	-	400
Benzo (ghi) perylene	0.07	0.2		< 40%	50	-	20
Benzo (k) fluoranthene	0.068	0.2		< 40%	1	-	100
Chrysene	0.049	0.2		< 40%	2	-	70
Dibenzo (a,h) anthracene	0.073	0.2		< 40%	0.5	-	40
Fluoranthene	0.043	0.2	40-140%	< 40%	90	-	200
Fluorene	0.057	0.2		< 40%	30	-	40
Indeno (1,2,3-cd) pyrene	0.079	0.2		< 40%	0.5	-	100
Naphthalene	0.064	0.2		< 40%	140	1000	20000
Phenanthrene	0.064	0.2		< 40%	40	-	10000
Pyrene	0.057	0.2	26-127%	< 40%	80	-	20
1-Methylnaphthalene	0.056	0.2		< 40%	-	-	-
2-Chloronaphthalene	0.066	0.2	40-140%	< 40%	-	-	-
2-Methylnaphthalene	0.06	0.2		< 40%	10	2000	20000
Additional - Analytes							
Hexachlorobutadiene	0.071	0.5		< 40%	0.6	1	3000
Pentachlorophenol	0.187	0.8	9-103%	< 40%	-	-	-
Hexachlorobenzene	0.0139	0.8		< 40%	-	-	-
Hexachloroethane	0.065	0.8		< 40%	-	-	-

Surrogates	% Recovery
2-Fluorophenol	21-120%
Phenol-d6	10-120%
Nitrobenzene-d5	23-120%
2-Fluorobiphenyl	15-120%
2,4,6-Tribromophenol	10-120%
4-Terphenyl-d14	33-120%

PCBs in soil EPA 8082							
Analytes	**MDL mg/Kg**	**RL mg/Kg**	**LCS/MS % Rec**	**MS/MSD % RPD**	**MCP METHOD 1 S-1/GW-1**	**MCP METHOD 1 S-1/GW-2**	**MCP METHOD 1 S-1/GW-3**
Aroclor 1016	6.58E-03	0.0333	40-140%	< 50%	2	2	2
Aroclor 1221	1.00E-02	0.0333		< 50%	2	2	2
Aroclor 1232	7.07E-03	0.0333		< 50%	2	2	2
Aroclor 1242	6.32E-03	0.0333		< 50%	2	2	2
Aroclor 1248	4.03E-03	0.0333		< 50%	2	2	2
Aroclor 1254	5.25E-03	0.0333		< 50%	2	2	2
Aroclor 1260	5.78E-03	0.0333	40-140%	< 50%	2	2	2
Aroclor 1262	2.46E-03	0.0333		< 50%	2	2	2
Aroclor 1268	4.83E-03	0.0333		< 50%	2	2	2

Surrogate(s)	% Recovery
2,4,5,6-Tetrachloro-m-xylene	30-150%
Decachlorobiphenyl	30-150%

PCB's in Liquid EPA 8082							
Analytes	**MDL ug/L**	**RL ug/L**	**LCS/MS % Rec**	**MS/MSD % RPD**	**MCP METHOD 1 GW-1**	**MCP METHOD 1 GW-2**	**MCP METHOD 1 GW-3**
Aroclor 1016	0.0660	0.25	40-140%	< 30%	0.5	5	10
Aroclor 1221	0.0580	0.25		< 30%	0.5	5	10
Aroclor 1232	0.0370	0.25		< 30%	0.5	5	10
Aroclor 1242	0.0720	0.25		< 30%	0.5	5	10
Aroclor 1248	0.0670	0.25		< 30%	0.5	5	10
Aroclor 1254	0.0410	0.25		< 30%	0.5	5	10
Aroclor 1260	0.0380	0.25	40-140%	< 30%	0.5	5	10
Aroclor 1262	0.0350	0.25		< 30%	0.5	5	10
Aroclor 1268	0.0290	0.25		< 30%	0.5	5	10

Surrogate(s)	% Recovery
2,4,5,6-Tetrachloro-m-xylene	30-150%
Decachlorobiphenyl	30-150%

Trace Metals Soil - EPA 6010B, 7471A							
Element	MDL mg/Kg	RL mg/Kg	LCS/MS % Rec	MSD RPD	MCP METHOD 1 S-1/GW-1	MCP METHOD 1 S-1/GW-2	MCP METHOD 1 S-1/GW-3
Aluminum	0.891	4.0	75-125%	< 35%	-	-	-
Antimony	0.383	2.0	75-125%	< 35%	20	20	20
Arsenic	0.0768	0.4	75-125%	< 35%	20	20	20
Barium	0.0338	0.4	75-125%	< 35%	1000	1000	1000
Beryllium	0.0140	0.2	75-125%	< 35%	100	100	100
Boron	0.326	0.8	75-125%	< 35%	-	-	-
Cadmium	0.0254	0.2	75-125%	< 35%	2	2	2
Calcium	0.916	4.0	75-125%	< 35%	-	-	-
Chromium	0.0812	0.4	75-125%	< 35%	30	30	30
Cobalt	0.0859	0.8	75-125%	< 35%	-	-	-
Copper	0.186	0.4	75-125%	< 35%	-	-	-
Iron	0.692	2.0	75-125%	< 35%	-	-	-
Lead	0.112	2	75-125%	< 35%	300	300	300
Magnesium	1.798	4.0	75-125%	< 35%	-	-	-
Manganese	0.0405	0.4	75-125%	< 35%	-	-	-
Mercury	0.0176	0.08	80-120%	< 20%	20	20	20
Molybdenum	0.174	2.0	75-125%	< 35%	-	-	-
Nickel	0.111	1.0	75-125%	< 35%	20	20	20
Potassium	31.9	100	75-125%	< 35%	-	-	-
Selenium	0.131	0.8	75-125%	< 35%	400	400	400
Silicon	5.57	20	75-125%	< 35%	-	-	-
Silver	0.0656	0.28	75-125%	< 35%	100	100	100
Sodium	31.8	80	75-125%	< 35%	-	-	-
Strontium	0.0614	0.4	75-125%	< 35%	-	-	-
Thallium	0.249	0.8	75-125%	< 35%	8	8	8
Tin	0.177	2.0	75-125%	< 35%	-	-	-
Titanium	0.0757	0.4	75-125%	< 35%	-	-	-
Vanadium	0.0892	0.4	75-125%	< 35%	600	600	600
Zinc	0.216	2.0	75-125%	< 35%	2500	2500	2500

Trace Metals Liquid - EPA 6010B, 7470A							
Element	MDL ug/L	RL ug/L	LCS % Rec	MS/MSD %Rec/RPD	MCP METHOD 1 GW-1	MCP METHOD 1 GW-2	MCP METHOD 1 GW-3
Aluminum	22.277	100	80-120%	75-125%/ <20%	-	-	-
Antimony	9.563	50	80-120%	75-125%/ <20%	6	-	8000
Arsenic	1.920	5	80-120%	75-125%/ <20%	10	-	900
Barium	0.845	10	80-120%	75-125%/ <20%	2000	-	50000
Beryllium	0.350	5	80-120%	75-125%/ <20%	4	-	200
Boron	8.154	20	80-120%	75-125%/ <20%	-	-	-
Cadmium	0.635	5	80-120%	75-125%/ <20%	5	-	4
Calcium	22.890	100	80-120%	75-125%/ <20%	-	-	-
Chromium	2.030	10	80-120%	75-125%/ <20%	100	-	300
Cobalt	2.147	20	80-120%	75-125%/ <20%	-	-	-
Copper	4.642	10	80-120%	75-125%/ <20%	-	-	-
Iron	17.300	50	80-120%	75-125%/ <20%	-	-	-
Lead	2.802	10	80-120%	75-125%/ <20%	15	-	10
Magnesium	44.941	100	80-120%	75-125%/ <20%	-	-	-
Manganese	1.013	10	80-120%	75-125%/ <20%	-	-	-
Mercury	0.069	0.2	80-120%	70-130% / < 20%	2	-	20
Molybdenum	4.343	50	80-120%	75-125%/ <20%	-	-	-
Nickel	2.787	25	80-120%	75-125%/ <20%	100	-	200
Potassium	798.578	2500	80-120%	75-125%/ <20%	-	-	-
Selenium	3.277	10	80-120%	75-125%/ <20%	50	-	100
Silicon	139.321	500	80-120%	75-125%/ <20%	-	-	-
Silver	1.640	7	80-120%	75-125%/ <20%	100	-	7
Sodium	795.200	2000	80-120%	75-125%/ <20%	-	-	-
Strontium	1.536	10	80-120%	75-125%/ <20%	-	-	-
Thallium	6.234	20	80-120%	75-125%/ <20%	2	-	3000
Tin	4.431	50	80-120%	75-125%/ <20%	-	-	-
Titanium	1.891	10	80-120%	75-125%/ <20%	-	-	-
Vanadium	2.229	10	80-120%	75-125%/ <20%	30	-	4000
Zinc	5.409	50	80-120%	75-125%/ <20%			

APPENDIX C

QAPP PROJECT PERSONNEL LOG SHEET

QAPP PROJECT PERSONNEL LOG SHEET

By signing this QAPP Project Personnel Log Sheet, you are verifying that you have read the attached QAPP and agree to follow the procedures described therein.

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

Name:_____

Company:_____

Signature:_____Date:_____

APPENDIX D

MBTA CERTIFICATION

This Section of the Notification provides the certification required by 40 CFR 761.61(a)(3)(i)(E).

I certify that the Self-Implementing Clean-Up Plan proposed in this document will meet the following requirements:

> All sampling plans, sample collection procedures, sample preparation procedures, extraction procedures, and instrumental/chemical analysis procedures used to assess or characterize the PCB contamination at the cleanup site are or will be on file at the following location and are available for U.S. EPA inspection:
>
> Massachusetts Bay Transportation Authority
> Department of Environmental Affairs
> 10 Park Plaza, Room 6720
> Boston, Massachusetts 02166
> Attn: Janis Kearney
> (617) 222-1592

Name (Printed) Janis O. Kearney

Signature Janis O. Kearney

Title Director of Environmental Compliance

Date 10·11·12