FEASIBILITY STUDY
VOLUME 3: APPENDICES

KING OPEN AND CAMBRIDGE STREET UPPER SCHOOLS & COMMUNITY COMPLEX

FEBRUARY 15, 2016

CITY OF CAMBRIDGE, MA

WILLIAM RAWN ASSOCIATES | Architects, Inc. + ARROWSTREET

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APPENDICES

FUSS & O'NEILL
EnviroScience, LLC

September 2, 2015

Mr. Kevin Bergeron, AIA, LEED AP
Senior Associate
William Rawn Associates Architects, Inc.
10 Post Office Square, Suite 1010N
Boston, MA 02109

RE: Limited Preliminary Hazardous Building Materials Inspection Summary
King Open Elementary & Cambridge Street Upper School
850 Cambridge Street, Cambridge, Massachusetts
Fuss & O'Neill EnviroScience, LLC No. 20140692.A2E

Dear Mr. Bergeron:

On July 17, 2015, Fuss & O'Neill EnviroScience, LLC (EnviroScience) representative, Mr. Jonathan Hand performed a limited preliminary hazardous building materials inspection for the King Open Elementary & Cambridge Street Upper School located at 850 Cambridge Street in Cambridge, Massachusetts (the "Site").

This visual inspection was limited to an inventory of accessible, suspect asbestos-containing material(s) (ACM), polychlorinated biphenyl (PCB)-containing source building materials, lead-based paint (LBP) coated surfaces, and an inventory of fluorescent light ballasts and mercury-containing equipment prior to proposed building renovations.

The information summarized in this document is for the abovementioned materials only. The work was performed for William Rawn Associates Architects, Inc. (the "Client") in accordance with our written scope of services dated November 21, 2014.

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1 Building Description

The Site buildings include a four (4) wing school with a crawlspace system, a library, and a pool building. The buildings were reportedly constructed in 1960 and reportedly underwent major renovations in 1984 to replace all of the window and door systems. The approximately area of the building is 112,200 square feet (SF). The four wings of the school include the following:

- Wings A and B - 2-Story Classroom Buildings;
- Wing C - Gymnasium, Boiler Room, and Cafeteria; and
- Wing D - One-Story Classroom Building.

The building is heated by forced hot water and steam heat from the boiler room; piping travels through a crawlspace system under the building. No central air conditioning is present in the school.

2 Asbestos-Containing Materials (ACM)

Mr. Hand is a Commonwealth of Massachusetts Department of Labor Standards (MADLS)-certified Asbestos Inspector. Refer to *Appendix A* for a copy of the Asbestos Inspector Commonwealth of Massachusetts certification and EPA accreditation. No samples were collected at the time of this inspection as it was a visual inspection of accessible, suspect ACM only.

The United States Environmental Protection Agency (EPA) Asbestos Hazard Emergency Response Act (AHERA) 3-Year Inspection report dated 1996 prepared by Briggs Associates, Inc. for this school (formerly the Harrington School) was provided and pertinent results were used in forming conclusions presented below.

2.1 Results

Utilizing the EPA, OSHA, MADLS, and the Commonwealth of Massachusetts Department of Environmental Protection (MassDEP) protocol and criteria, the following materials were determined to be either an **ACM**, or **Presumed ACM (PACM)**:

- 12” x 12” Floor Tile (Multiple Colors) and Associated Mastics/Adhesives;
- 9” x 9” Floor Tile (Multiple Colors) and Associated Mastics/Adhesives;
- Vinyl Baseboard and Associated Adhesive;
- Ceramic Floor & Wall Tile Adhesive, Thin-Set Mortar, & Grout;
- Quarry Tile Adhesive, Thin-Set Mortar, & Grout;
- Terrazzo Dampproofing;
- Flooring Felt Associated with Wood Flooring;
- Rubber Floor Adhesive;
- Vinyl Counter Top Sheeting and Associated Mastics/Adhesives;

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- Glue Daubs Associated with 1'x1' Ceiling Tiles;
- Spray-Applied Fire-Proofing;
- Stage Curtain;
- Stage Lighting Wiring;
- Joint Compound Associated with Partition Walls;
- Plaster Walls and Ceilings;
- Sink Undercoating (Multiple Colors);
- Interior Door and Sidelight Glazing Compound;
- Transom Window Glazing Compound;
- Fire Door Core Insulation;
- Blackboard Adhesive;
- Fiber-Reinforced Cement Board;
- Vibration Isolators;
- Pipe Insulations and Associated Fitting Insulations;
- Boiler Insulation;
- Interior Boiler Components;
- Boiler Breeching Insulation;
- Boiler Breeching Gasketing;
- Hot Water Tank Insulation;
- Incinerator Insulation;
- Generator Exhaust Insulation;
- Kiln Insulation;
- Kitchen Exhaust Hood Insulation;
- Interior/Exterior Door/Window Caulking;
- Exterior Expansion-Joint Caulking;
- Louver Caulking;
- Dampproofing behind Brick Veneer;
- Sub-Slab Dampproofing;
- Built-Up Roofing; and
- Roofing Sealants.

Refer to **Table 1** (*Attachment B*) for the complete list of suspect ACM and non-ACM identified as part of this visual inspection.

2.2 Conclusion and Recommendations

Based on visual observations and previous reports, ACM are present at the Site.

Prior to renovation or demolition, a thorough asbestos inspection is required of all suspect asbestos-containing materials.

Prior to disturbance, ACM/ACWM that would likely be impacted by the proposed demolition activities must first be abated by a MADLS-licensed Asbestos Abatement Contractor. This is a requirement of MADLS, MassDEP, and EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) regulations governing asbestos abatement.

3 Lead-Based Paint Screening

On July 15, 2015, Mr. Hand of EnviroScience performed a visual inspection of suspect LBP coated building components at the Site that may be disturbed during demolition activities.

3.1 Methodology

Worker protection is regulated by OSHA regulations, as well as MADLS regulations. These regulations include air monitoring of workers to determine exposure levels when disturbing lead-containing paint. An LBP screening cannot determine a safe level of lead, but is intended to provide guidance for implementing industry standards for lead in paint at identified locations. Contractors may better determine worker exposure to airborne lead by understanding the different concentrations of LBP on representative components and surfaces. Air monitoring can then be performed during activities that disturb paint on representative surfaces.

The EPA Resource Conservation and Recovery Act (RCRA) and MassDEP regulate lead-containing waste disposal. If lead is determined to be present, representative composite samples of the anticipated waste stream must be collected and analyzed using the Toxicity Characteristic Leaching Procedure (TCLP). The results are compared to a threshold value of 5.0 milligrams per liter (mg/L). If TCLP sample analytical results exceed this value, the waste is characterized as hazardous lead waste. If the result is below the threshold value, the waste material is <u>not</u> considered hazardous and may be disposed as construction and demolition debris.

A level of paint exceeding 1.0 milligram of lead per square centimeter (mg/cm^2) of surface area is considered toxic or dangerous by EPA and the Massachusetts Department of Public Health (MADPH) child-occupied residential standards.

3.2 Results

Due to the age of construction, LBP-coated building materials may be present at the Site.

3.3 Conclusions and Recommendations

Based on our visual assessment, LBP is likely present on coated building components located on and in the building.

Contractors must be made aware that OSHA has not established a level of lead in a material below which Title 29 CFR, Part 1926.62 does not apply. Contractors shall comply with exposure assessment criteria, interim worker protection, and other requirements of the regulation as necessary to protect workers during any renovation and/or demolition work that will impact LBP.

If disturbed by demolition activities, LBP-coated building components should be segregated from the general demolition waste stream for sample collection and analysis by TCLP to determine proper off-site waste disposal. If disturbed and managed off-site, non-porous LBP-coated building materials (i.e., metals) may be segregated and recycled as scrap metal. Metal LBP-coated building components cannot be subject to grinding, sawing, drilling, sanding, or torch cutting.

The Site is presently characterized as a commercial property, which is not subject to the MADPH Childhood Lead Poisoning Prevention Program (CLPPP) Regulation 105 CMR, Part 460.000. The Site may be renovated using procedures required in accordance with OSHA Title 29 CFR, Part 1926.62 and MADLS Regulation 454 CMR, Part 22.11. In addition, the building is not considered a "child-occupied facility" and therefore, is not subject to MADPH CLPPP regulations.

4 Polychlorinated Biphenyls (PCBs) Source Building Materials

4.1 Background

On July 17, 2015, Mr. Hand of EnviroScience completed an inventory of visible, accessible presumed PCB-containing source building materials.

Sampling of building materials for PCBs is presently not mandated by the EPA. However, they recommend testing materials installed from 1950 through 1979. Significant liability risk exists for improperly disposing of PCB-containing waste materials. Recent knowledge and awareness of PCBs within matrices such as caulking, glazing compounds, paints, adhesives and ceiling tiles has become more prevalent, especially among remediation contractors, waste haulers, and disposal facilities.

The EPA requirements apply and require removal of PCBs once identified, regardless of project intent, as an unauthorized use of PCBs. Therefore, if a building is to remain for re-use and PCBs are identified, the EPA still requires PCB material removal once it is determined that PCBs are present. In addition to PCB-containing source material identification, if PCBs are present at certain concentrations, additional sampling and analysis of adjacent surfaces in contact with PCB sources, or which may have been contaminated from a source of PCBs (e.g. soil), must also be performed or remediated.

EPA requirements apply only if PCBs are present in concentrations above a specified level. Presently, PCB-containing materials at concentrations equal to or greater than (≥) 50 parts per million (ppm), or equivalent units of milligrams per kilogram (mg/kg) are regulated.

4.2 Results

Utilizing the EPA protocol and criteria, the following materials were presumed to contain regulated concentrations of PCBs:

- Interior Fire Door Sidelight Window Glazing Compound;
- Fire Door Window Glazing Compound; and
- Roof Sealants.

4.3 Conclusions and Recommendations

The newer aluminum window frames were reportedly installed in 1984. This is after the EPA recommended testing date for suspect PCB-containing source building materials of December 31, 1979. Therefore, the associated window caulking is presumed to be a non-PCB-containing (source) building material.

Identified materials should be presumed to contain regulated concentrations (≥ 50 ppm) of PCBs until sample collection and analysis indicate otherwise. These materials should be removed and disposed at an EPA-approved facility as a regulated PCB-containing material.

5 Fluorescent Light Ballasts and Mercury-Containing Equipment

5.1 Fluorescent Light Ballasts

Fluorescent light ballasts manufactured prior to 1979 may contain capacitors that contain PCBs. Light ballasts installed as late as 1985 may contain PCB capacitors. Fluorescent light ballasts that are not labeled as "No PCBs" must be assumed to contain PCBs unless proven otherwise by quantitative analysis. Capacitors in fluorescent light ballasts labeled as non-PCB-containing may contain diethylhexl phthalate (DEHP). DEHP was the primary substitute to replace PCBs for small capacitors in fluorescent lighting ballasts in use until 1991. DEHP is a toxic substance, a suspected carcinogen, and is listed under RCRA and the Superfund Law as a hazardous waste. Therefore, Superfund liability exists for landfilling both PCB- and DEHP-containing light ballasts. These listed materials are considered hazardous waste under RCRA and require special handling and disposal considerations.

5.2 Mercury-Containing Equipment

Fluorescent lamps/tubes are presumed to contain mercury vapor, which is a hazardous substance to both human health and the environment. Thermostatic controls and electrical switch gear may contain a vial or bulb of liquid mercury associated with the control. Mercury-containing equipment is regulated for proper disposal by the EPA RCRA regulations.

5.3 Results

On July 17, 2015, Mr. Hand of EnviroScience performed a visual inspection of representative fluorescent light fixtures in-place to identify possible PCB-containing ballasts in the building. The inspection involved visually inspecting labels on representative light ballasts to identify dates of manufacture and labels indicating "No PCBs". Ballasts manufactured after 1991 were not listed as PCB- or DEHP-containing ballasts, and were not quantified for disposal. An in-place inventory of the fluorescent lamps/tubes and other mercury-containing equipment was completed concurrently.

5.4 Conclusions and Recommendations

PCB/DEHP-containing light ballasts were presumed to be present in the building and mercury-containing equipment was identified in the building during this inspection.

Light ballasts marked as "No PCBs" with date labels indicating manufacture prior to 1991 are presumed to contain DEHP. DEHP-containing light ballasts must be segregated for proper packaging, transporting, and disposal as non-PCB hazardous waste. Note that disposal requirements for DEHP-containing ballasts are slightly varied, and disposal costs are slightly less than PCB-containing light ballasts.

According to the EPA, mercury-containing equipment is characterized as a hazardous waste and mercury lamps/tubes are characterized as a Universal Waste. The mercury-containing equipment and fluorescent lamps/tubes identified in the proposed renovation areas must be recycled, reclaimed, or disposed as hazardous waste prior to disturbance.

Refer to *Attachment C* for the Hazardous Building Materials Opinion of Abatement Cost.

If you should have any questions regarding the contents of this letter, please do not hesitate to contact Dustin Diedricksen at (617) 282-4675, extension 4703. Thank you for this opportunity to have served your environmental needs.

This report was prepared by Environmental Analyst, Jonathan Hand.

Reviewed by:

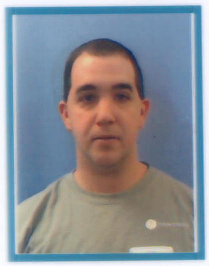
Dustin A. Diedricksen
Project Manager

Attachments: A - EnviroScience Asbestos Inspector State Certification and Accreditation
B - Table 1 - Summary of Asbestos-Containing Materials Data
C - Hazardous Building Materials Opinion of Abatement Cost

Attachment A

EnviroScience Asbestos Inspector State Certification and EPA Accreditation

Commonwealth of Massachusetts
Department of Labor Standards
Heather E. Rowe, Director
Asbestos Inspector



JONATHAN L. HAND
Eff. Date 03/13/15
Exp. Date 03/13/16
AI041945
Member of C.O.N.E.S.
WBR WB-RENEW

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Fuss & O'Neill EnviroScience, LLC

146 Hartford Road, Manchester, CT 06040 – (860) 646-2469

This is to certify that

Jonathan Hand

xxx-xx-8836

has successfully completed the

4 Hr. Asbestos Inspector Refresher

Asbestos Accreditation under TSCA Title II

40 CFR Part 763

John Rowinski, Principal Instructor	*Robert L. May, Jr., Training Manager*
January 6, 2015	AI-R-01/15-1
Date of Course	*Certificate Number*
January 6, 2015	January 6, 2016
Examination Date	*Expiration Date*

Attachment B

Table 1 - Summary of Asbestos-Containing Materials Data

FUSS & O'NEILL EnviroScience, LLC

Table 1

Summary of Suspect Asbestos-Containing Materials Data

King Open Elementary & Cambridge Street Upper School

September 2, 2015

Material Type	Location(s)/Sample Location(s)	Asbestos Content	Estimated Quantity	Comments
9" x 9" Floor Tile (Multiple Colors) and Associated Mastics/Adhesives	Classrooms and Offices	PACM	57,500 SF**	
9" x 9" Gray Floor Tile	1st Floor - Room 10 Bathroom	8% Chrysotile		
9" x 9" Beige Floor Tile	1st Floor - Room 113 Bathroom	35% Chrysotile		
9" x 9" Brown Spec Floor Tile	C-Wing - Home Economics	8% Chrysotile		
9" x 9" Mocha Floor Tile	C-Wing - Home Economics	15% Chrysotile		
9" x 9" Green Floor Tile	Music Room	15% Chrysotile		
9" x 9" Beige Speckled Floor Tile	Resource Room	35% Chrysotile		
9" x 9" Light Brown Floor Tile	Not Stated	8% Chrysotile		
9" x 9" Maroon Floor Tile	Literary Center Supply Room	8% Chrysotile		
9" x 9" Orange Floor Tile	KIA Bathroom	8% Chrysotile		
12" x 12" Floor Tile (Multiple Colors) and Associated Mastics/Adhesives	Classrooms and Offices	PACM	2,400 SF**	
12" x 12" Blue Floor Tile	1st Floor - Room 111 Bathroom	Non-ACM		Supplemental sampling required to confirm material type as non-ACM
12" x 12" Tan Floor Tile	Literary Center	3% Chrysotile		
12" x 12" White Floor Tile	Auditorium Back Storage Room	Non-ACM		Supplemental sampling required to confirm material type as non-ACM
12" x 12" Flesh Colored Floor Tile	D-Wing - KIA	Non-ACM		Supplemental sampling required to confirm material type as non-ACM
Vinyl Baseboard and Associated Adhesive	Spiratic in Classrooms, Offices, & Hallways	PACM	1,000 SF	
Ceramic Floor & Wall Tile Adhesive, Thin-Set Mortar, & Grout	D-Wing	PACM	1,000 SF	
Quarry Tile Adhesive, Thin-Set Mortar, & Grout	Kitchen	PACM	1,700 SF	
Terrazzo Dampproofing Mastics/Materials	Hallways, Offices, Cafeteria, Locker Rooms, & Stairwells	PACM	18,500 SF	
Flooring Felt Associated with Wood Flooring	Gymnasium, Shop, and Stage	PACM	10,000 SF	
Rubber Floor Adhesive	Auditorium	PACM	600 SF	
Vinyl Counter Top Sheeting and Associated Mastics/Adhesives	Classrooms	Non-ACM*	N/A	Supplemental sampling required to confirm material type as non-ACM
Rust Colored Vinyl Counter Top Sheeting	Room 117			
Black Vinyl Counter Top Sheeting	Room 111			
Brown Vinyl Counter Top Sheeting	B-Wing - 1st Floor Teacher's Room			
Glue Daubs Associated with 1'x1' Ceiling Tiles	Throughout Classrooms, Offices, & Hallways	17% Anthophyllite	50,600 SF	Remove and Dispose Gypsum Backer Board and Ceiling Tiles as ACWM
1' Ceiling Tiles	Auditorium	Non-ACM*	N/A	Supplemental sampling required to confirm material type as non-ACM

FUSS & O'NEILL
EnviroScience, LLC

Table 1
Summary of Suspect Asbestos-Containing Materials Data

Material Type	Location(s)/Sample Location(s)	Asbestos Content	Estimated Quantity	Comments
2' x 2' Ceiling Tiles	B-Wing - 1st Floor Hall by Room 118	Non-ACM*	N/A	Supplemental sampling required to confirm material type as non-ACM
2' x 4' Ceiling Tile	Boiler Room Storage	Non-ACM*	N/A	Supplemental sampling required to confirm material type as non-ACM
2' x 4' Fissure & Dot Ceiling Tile	Back Auditorium Exit	Non-ACM*	N/A	Supplemental sampling required to confirm material type as non-ACM
Spray-Applied Fire-Proofing	1st Floor A & B Wings, Generator Room, & Gymnasium	50% Blend	63,500 SF***	Porous Ceiling Materials and Open-Cell Block Walls Need to be Disposed as ACWM.
Stage Curtain	Auditorium	PACM	1 EA	
Stage Lighting Wiring	Auditorium	PACM	100 LF	
Joint Compound Associated with Partition Walls	Throughout School	PACM	10,000 SF	
Drywall Associated with Partition Walls	Home Economics and Gymnasium Fan Room	Non-ACM*	N/A	Supplemental sampling required to confirm material type as non-ACM
Plaster Walls and Ceilings	Kitchen Freezer Ceiling	Non-ACM*	N/A	Supplemental sampling required to confirm material type as non-ACM
Plaster Ceiling Rough Coat	Custodial Storage at Girl's Locker Room			
Plaster Ceiling Rough Coat	B-Wing - 1st Floor Girl's Bathroom			
Plaster Ceiling Skim Coat	Custodial Storage at Girl's Locker Room			
Plaster Wall Skim Coat	B-Wing - 1st Floor Closet between Bathrooms			
Plaster Wall Skim Coat	A-Wing - Boy's Bathroom			
Plaster Skim Coat	Gym Storage at Boy's Locker Room			
Plaster Skim Coat	Visiting Team Locker Room			
Plaster Skim Coat	Hallway From Girl's Locker room to Gymnasium			
Plaster Ceiling Skim Coat	B-Wing - 1st Floor Closet Between Bathrooms			
Sink Undercoating (Multiple Colors)	Classrooms	PACM	75 EA	
Interior Door Sidelight Glazing Compound	Hallways	PACM	35 EA	
Transom Window Glazing Compound	Hallways	PACM	50 EA	
Interior Door Window Glazing Compound	Hallways, Classrooms, & Offices	PACM	50 EA	
Fire-Door Core Insulation	Hallways, Classrooms, & Offices	PACM		
Interior Expansion-Joint Caulking	Gymnasium	Non-ACM*	N/A	Supplemental sampling required to confirm material type as non-ACM
Blackboard Adhesive	Classrooms	PACM	100 @ 4' x 12' EA	
Fiber-Reinforced Cement Board	Boiler Room	PACM	50 SF	
Vibration Isolators	Throughout Interoir	PACM	25 EA	
Pipe Insulations and Associated Fitting Insulations	Oil Tank Pipe Chase & Concealed in Chases & Above Ceilings	60% Amosite	3,500 LF**	
Boiler Insulation	Boiler Room	5% Chrysotile	600 SF**	

FUSS & O'NEILL
EnviroScience, LLC

Table 1
Summary of Suspect Asbestos-Containing Materials Data

Material Type	Location(s)/Sample Location(s)	Asbestos Content	Estimated Quantity	Comments
Interior Boiler Components	Boiler Room	PACM	2 EA	
Boiler Breeching Insulation	Boiler Room	3% Chrysotile	1,100 SF**	
Boiler Breeching Gasketing	Boiler Room	PACM	10 EA	
Hot Water Tank Insulation	Boiler Room	PACM	75 SF**	
Incinerator Insulation	Boiler Room	PACM	250 SF	
Generator Exhaust Insulation	Generator Room	PACM	20 LF**	
Kiln Insulation	Generator Room	PACM	1 EA	
Exhaust Hood Insulation	Kitchen	PACM	300 SF	
Interior/Exterior Window Caulking	Exterior	PACM	11,000 LF	Windows Replaced in 1984
Interior/Exterior Door Caulking	Exterior	PACM	800 LF	Doors Replaced in 1984
Exterior Expansion-Joint Caulking	Exterior	PACM	5,000 LF	At Newer Window Inserts
Louver Caulking	Exterior	PACM	100 LF	Louver Caulking Replaced in 1984
Through-Wall Flashing & Dampproofing behind Brick Veneer	Exterior	PACM	36,000 SF	Assume 2/3 of Total Façade SF
Sub-Slab Dampproofing Materials	Below-Grade	PACM	97,750 SF	
Built-Up Roofing	School & Pool Building Roofs	PACM	97,750 SF	
Roofing Sealants	School & Pool Building Roofs	PACM	2,000 LF	

EA = Each; LF = Linear Feet; SF = Square Feet

ACM = Asbestos-Containing Material

ACWM = Asbestos-Containing Waste Material

PACM = Presumed Asbestos-Containing Material

* Denotes that an insufficient number of samples were collected and analyzed. Therefore, supplemental sample collection and analysis of these suspect ACM must be conducted to fulfill EPA NESHAP requirements prior to renovation/demolition actitivities.

** Denotes quantity based on 1996 AHERA report prepared by Briggs Associates, Inc. No attempt has been made at this point to verify quantities provided in this report.

*** Denotes Quantity based on square footage of floor and not the 1996 AHERA report.

Attachment C

Hazardous Building Materials Opinion of Abatement Cost

FUSS & O'NEILL
EnviroScience, LLC

Hazardous Building Materials Opinion of Abatement Cost
King Open Elementary & Cambridge Street Upper School

Fuss & O'Neill EnviroScience, LLC has prepared the hazardous building materials opinion of abatement costs provided below (for the abovementioned Site). These estimates are for visible and accessible areas only, and are based on our Limited Preliminary Hazardous Building Materials Inspection report prepared for the Site. Unit costs are based on current industry rates and are inclusive of typical contractor costs for a normal work schedule (1 shift/day), Monday to Friday. They do not include costs for an expedited work schedule (double shifts/ weekends/ holidays), project design, construction monitoring, air sampling, and other consultant-based fees. Estimated unit costs are based on assumption that listed materials will be removed, disposed, and transported by the abatement contractor during one phase.

Material Type	Estimated Quantity	Estimated Unit Cost	Total Estimated Cost
9" x 9" Floor Tile (Multiple Colors) and Associated Mastics/Adhesives (ACM/Presumed ACM)	57,500 SF	$4/SF	$230,000.00
12" x 12" Floor Tile (Multiple Colors) and Associated Mastics/Adhesives (ACM/Presumed ACM)	2,400 SF	$4/SF	$9,600.00
Vinyl Baseboard and Associated Adhesive (Presumed ACM)	1,000 SF	$4/SF	$4,000.00
Ceramic Floor & Wall Tile Adhesive, Thin-Set Mortar, & Grout (Presumed ACM)	1,000 SF	$8/SF	$8,000.00
Quarry Tile Adhesive, Thin-Set Mortar, & Grout (Presumed ACM)	1,700 SF	$10/SF	$17,000.00
Terrazzo Dampproofing Mastics/Materials (Presumed ACM)	18,500 SF	$10/SF	$185,000.00
Flooring Felt Associated with Wood Flooring (Presumed ACM)	10,000 SF	$7/SF	$70,000.00
Rubber Floor Adhesive (Presumed ACM)	600 SF	$5/SF	$3,000.00
Glue Daubs Associated with 1'x1' Ceiling Tiles (ACM)	50,600 SF	$6/SF	$303,600.00
Spray-Applied Fire-Proofing (Includes Removal of Contaminated Porous Ceiling and Wall Materials) (ACM)	63,500 SF	$15/SF	$952,500.00
Stage Curtain (Presumed ACM)	1 EA	$2,000/EA	$2,000.00
Stage Lighting Wiring (Presumed ACM)	100 LF	$10/LF	$1,000.00
Joint Compound Associated with Partition Walls (Presumed ACM)	10,000 SF	$7/SF	$70,000.00
Sink Undercoating (Multiple Colors) (Presumed ACM)	75 EA	$125/EA	$9,375.00

Material Type	Estimated Quantity	Estimated Unit Cost	Total Estimated Cost
Interior Door Sidelight Glazing Compound (Presumed ACM & Presumed PCB)	35 EA	$400/EA	$14,000.00
Transom Window Glazing Compound (Presumed ACM & Presumed PCB)	50 EA	$225/EA	$11,250.00
Interior Door Window Glazing Compound (Presumed ACM)	50 EA	$150/EA	$7,500.00
Fire-Door Core Insulation (Presumed ACM)			
Blackboard Adhesive ~ 4' x 12' (Presumed ACM)	100 EA	$200/EA	$20,000.00
Fiber-Reinforced Cement Board (Presumed ACM)	50 SF	$8/SF	$400.00
Vibration Isolators (Presumed ACM)	25 EA	$100/EA	$2,500.00
Pipe Insulations and Associated Fitting Insulations (ACM)	3,500 LF	$25/LF	$87,500.00
Boiler Insulation (ACM)	600 SF	$25/SF	$15,000.00
Interior Boiler Components (Presumed ACM)	2 EA	$5,000/EA	$10,000.00
Boiler Breeching Insulation (ACM)	1,100 SF	$25/SF	$27,500.00
Boiler Breeching Gasketing (Presumed ACM)	10 EA	$100/EA	$1,000.00
Hot Water Tank Insulation (Presumed ACM)	75 SF	$25/SF	$1,875.00
Incinerator Insulation (Presumed ACM)	250 SF	$25/SF	$6,250.00
Generator Exhaust Insulation (ACM)	20 LF	$25/LF	$500.00
Kiln Insulation (Presumed ACM)	1 EA	$1,000/EA	$1,000.00
Exhaust Hood Insulation (Presumed ACM)	300 SF	$25/SF	$7,500.00
Interior/Exterior Window Caulking (Presumed ACM)	11,000 LF	$7/LF	$77,000.00
Interior/Exterior Door Caulking (Presumed ACM)	800 LF	$7/LF	$5,600.00
Exterior Expansion-Joint Caulking (Presumed ACM)	5,000 LF	$7/LF	$35,000.00
Louver Caulking (Presumed ACM)	100 LF	$7/LF	$700.00

Material Type	Estimated Quantity	Estimated Unit Cost	Total Estimated Cost
Through-Wall Flashing & Dampproofing behind Brick Veneer (Includes Removal of the Masonry Unit Back-up Wall as ACWM) (Presumed ACM)	36,000 SF	$20/SF	$720,000.00
Sub-Slab Dampproofing Materials (Includes Removal of the Slab as ACWM) (Presumed ACM)	97,750 SF	$15/SF	$1,466,250.00
Built-Up Roofing (Presumed ACM)	97,750 SF	$5/SF	$488,750.00
Roofing Sealants (Presumed ACM & Presumed PCB)	2,000 LF	$12/LF	$24,000.00
Disposal of Lighting Ballasts, Fluorescent Lamps, and Mercury-Containing Equipment		Lump Sum	$10,000.00
Lead-Based Paint Work Practices & Limited Disposal		Lump Sum	$25,000.00
		Subtotal	**$4,931,150.00**
		(~10%) Contingency	**$493,115.00**
		Total*	**$5,424,265.00**

EA=Each; LF=Linear Feet; SF=Square Feet

ACM = Asbestos-Containing Material

ACWM = Asbestos-Containing Waste Material

PCB = Polychlorinated Biphenyl

* Does not include consultant fees

PRELIMINARY GEOTECHNICAL REPORT AND ENVIRONMENTAL EVALUATION

King Open and Cambridge Street Upper Schools and Community Complex

Prepared for

City of Cambridge

April 24, 2015

CDM Smith

CITY OF CAMBRIDGE

King Open and Cambridge Upper Schools and Community Complex Cambridge, Massachusetts

April 24, 2015
Preliminary Geotechnical Report and Environmental Evaluation

Prepared By:
CDM Smith

Vivian Chan
Geotechnical Engineer

Prepared By:
CDM Smith

Elizabeth Wroe
Geotechnical Engineer

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Section 1
Introduction

1.1 General

This report summarizes the results of CDM Smith's subsurface exploration and laboratory testing programs, and presents preliminary geotechnical design recommendations and construction considerations and environmental evaluations for the King Open and Cambridge Street Upper Schools and Community Complex located in Cambridge, Massachusetts.

1.2 Elevation Datum

Elevations noted herein are referenced to the Cambridge City Base (CCB) and are in feet.

1.3 Project Description

The King Open and Cambridge Street Upper Schools and Community Complex site consists of an existing school, library, and swimming pool complex. The proposed construction for the site includes a complete demolition of the existing structures and construction of a new school for pre-K through 8th grades, a branch library, a community public pool, and administrative offices for the City of Cambridge School Department. It is assumed that the new school buildings will have a similar overall size as the existing structures and will include a one-level underground garage or basement below all structures.

1.4 Purpose and Scope

The purpose of this preliminary report is to investigate the subsurface conditions at the existing King Open and Cambridge Street Upper Schools and Community Complex Site and to provide preliminary geotechnical engineering recommendations for the design and construction of building foundations as well as to assess environmental conditions in the subsurface with respect to chemical concentrations in soil. Specifically, the scope of work included the following:

- Collect and review available geotechnical data, and geologic information in the site vicinity;
- Conduct field investigations consisting of six (6) test borings, (CDM-1 through CDM-6), to investigate subsurface conditions and obtain soil samples for laboratory testing;
- Install two (2) monitoring wells for groundwater elevation monitoring and groundwater sampling;
- Conduct laboratory tests on soil samples collected as part of this study to assist with classification of soils encountered and to estimate the engineering properties of the soils;
- Develop preliminary geotechnical engineering recommendations for design and construction;
- Conduct a file review and site visit to identify any recognized environmental concerns at the property;

- Conduct laboratory tests on soil samples for chemical constituents for evaluation under the Massachusetts Contingency Plan (MCP) and to assist in the evaluation of on-site reuse and/or off-site disposal options;
- Develop evaluation for on-site soil reuse and/or off-site disposal options based on the results of laboratory analysis; and
- Prepare this preliminary geotechnical report presenting CDM Smith's recommendations, including data collected as part of the investigations and recommendations for additional explorations required prior to final design.

1.5 Report Limitations

These recommendations have been prepared for the King Open and Cambridge Street Upper Schools and Community Complex located in Cambridge, Massachusetts as understood at this time and described in this preliminary report. This preliminary report has been prepared in accordance with generally accepted engineering practices. No other warranty, express or implied, is made.

The recommendations contained herein are considered preliminary and will need to be confirmed and/or reviewed prior to the completion of the final design of the facility. The recommendation and considerations presented assume that the project consists of the demolition of existing facilitates and the design and construction of replacement structure(s) and may not be suitable for upgrades to the existing structures. Additional field investigations, laboratory testing and analysis are required to provide recommendations suitable for final design and cost estimating.

Section 2

Site and Subsurface Conditions

2.1 Existing Site Conditions

2.1.1 Site Topography, Features and Boundaries

The King Open and Cambridge Upper Schools and Community Complex is located at 850 Cambridge Street in Cambridge, Massachusetts. The site is bounded to the north by Cambridge Street, to the east by Berkshire Street, to the west by Willow Street and to the south by the Frisoli Youth Center and Donnelly Field. Both Willow Street and Berkshire Street are residential areas, whereas Cambridge Street has combined commercial and residential buildings. Donnelly Field consists of three baseball fields, a playground, and two basketball courts. The topography of the site is relatively flat with site grades ranging from approximately El. 20 to El. 23. **Figure 2-1** shows the layout of the existing site.

2.1.2 Existing Structures

The King Open and Cambridge Upper Schools and Community Complex consists of the King Open School, the Cambridge Upper School, a public library, and a community center with an outdoor pool.

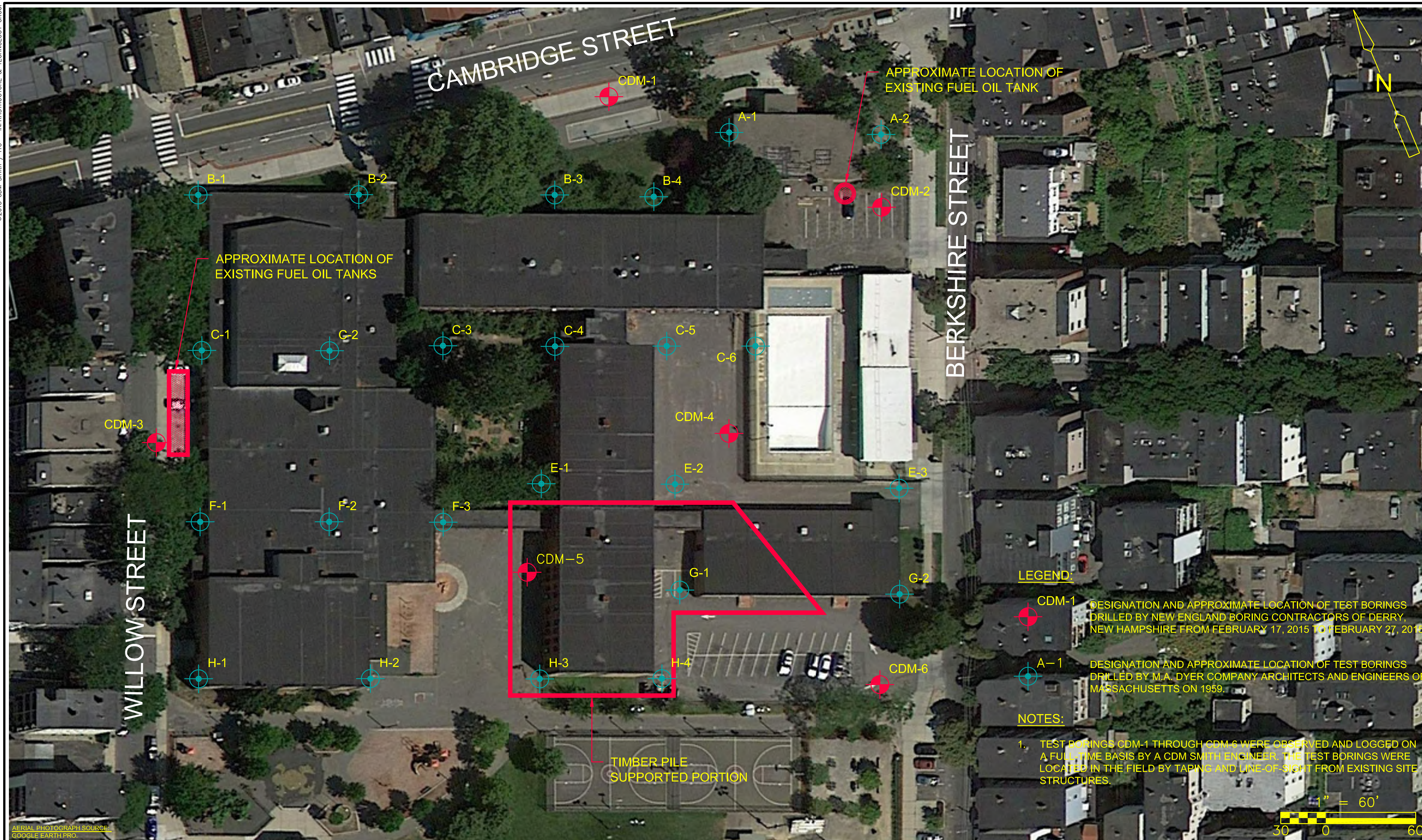
The existing King Open and Cambridge Upper Schools are both housed in an one to two story steel frame building with sidewalls consisting of masonry, insulated panels and window wall panel systems. The school building complex was constructed in the early 1960's and has a footprint of approximately 108,500 square feet. The building complex consists of four main buildings connected to each other via corridors and walkways. The existing Cambridge Public Library Salvatore F. Valente Branch is located on the northeast side of the site and is part of this school complex. The library is a one story structure with a footprint of approximately 5,500 square feet.

The school and library are primarily supported on shallow foundations with bottom elevations ranging from approximately 12 to 14 feet below ground surface (bgs), except for the southern part of the building that is supported by timber piles. The finished floor elevation of the school and library ranges from approximately El. 23.0 to El. 23.5. Crawl spaces are located below the school and library buildings ranging in height from approximately 4 to 6 feet.

Two 20,000 gallon fuel oil (F.O.) tanks are located below ground at the school loading dock off of Willow Street and connect to the boiler room on the west side of the school. An additional F.O. tank supplying fuel to the library is located below the library parking lot off of Berkshire Street.

The school and library complex are directly adjacent to the Gold Star Pool complex, which includes an approximately 18 feet by 40 feet pool and a 700 square foot one story locker room and service building.

Outside of the existing structures, the site is mostly paved and includes three paved parking lots with access to Berkshire Street and a playground on the southern end of the site. There is a landscaped courtyard at the center of the site and a lawn fronting on Cambridge Street.



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CITY OF CAMBRIDGE
CAMBRIDGE, MASSACHUSETTS

KING OPEN AND CAMBRIDGE STREET UPPER SCHOOLS
AND COMMUNITY COMPLEX

SUBSURFACE EXPLORATION LOCATION PLAN
FIGURE 2-1

2.2 Subsurface Investigations

2.2.1 Previous Test Boring Program

Twenty-nine (29) test borings (A-1 through H-4) were previously performed for the initial construction of the King Open and Cambridge Upper Schools and Community Complex in the 1950s by M.A. Dyer Company Architects and Engineers. Boring depths ranged from approximately 20 to 68 feet below ground surface. There is no record of any monitoring wells being installed nor of any environmental testing conducted as part of the previous investigation program.

Boring logs prepared by M.A. Dyer Company Architects and Engineers are shown on the drawing from the original school construction in 1959 and included in **Appendix A**.

2.2.2 Recent Test Boring Program

To assess the subsurface conditions at the location of the proposed facility, a subsurface exploration program was conducted, which included six (6) test borings. The test boring locations were located in the field by taping and line of sight from existing site features and are shown in **Figure 2-1**.

Test borings were drilled by New England Boring Contractors of Derry, New Hampshire between February 17 and February 27, 2015. All test borings, CDM-1 through CDM-6, were drilled using a truck-mounted drill rig. The six (6) borings were drilled using drive and wash methods with 4–inch outside diameter (O.D.) casing. The test borings were drilled to depths ranging from approximately 53 to 71 feet below ground surface (bgs).

Split spoon sampling was typically conducted in soils continuously for approximately the upper 25 feet, and then at 5 foot intervals below, in accordance with ASTM D1586 (using a 2-inch O.D. sampler, driven 24 inches by blows from a 140-pound hammer falling freely for a 30-inches). The number of blows required to drive the sampler each 6-inch increment was recorded and the Standard Penetration Resistance (N-value) was determined as the sum of the blows over the middle 12-inches of penetration. Upon split spoon sampler retrieval, soils were examined for visual evidence (i.e., staining, discoloration) and olfactory indications (i.e., odors) of contamination. All soil samples collected from recent test borings were screened using a photoionization detector (PID) for volatile organic compound (VOC) to assess the possible presence of organic vapors. A CDM Smith representative visually classified the soil samples recovered in the field in general accordance with the Burmister classification system. Representative soil samples from each split spoon were collected and stored in jars for subsequent review and laboratory testing.

Analytical samples were collected by compositing split-spoon samples within the upper 8 feet of the test borings. The analytical samples from each test boring were stored in corresponding jars and vials for subsequent laboratory testing by Alpha Analytical in Westborough, Massachusetts.

Undisturbed tube sampling was conducted at selected locations in fine-grained (cohesive) soils using standard Shelby tube sampler and in general accordance with ASTM D-1587. Shelby tube samples were tested with a pocket penetrometer and torvane to estimate basic strength properties of the material. Shelby tube samples were then trimmed and both ends of the tube and were sealed with plastic caps, tape and wax for subsequent review and laboratory testing.

When possible, groundwater levels at the test boring locations were estimated from the condition of the samples obtained and by the observed water levels within the borehole at the time of drilling.

However, with the drive and wash drilling method, groundwater level readings taken during drilling are not generally considered reliable due to the presence of the drilling fluids in the borehole.

Two (2) groundwater observation wells were installed at test boring locations CDM-2 (MW) and CDM-3 (MW). All other test borings were backfilled with soil cuttings to the ground surface upon completion and were sealed with asphalt patch where necessary.

Recent test boring logs, prepared by CDM Smith, are included in **Appendix B**.

2.2.3 Monitoring Wells

Two (2) monitoring wells, CDM-2 (MW) and CDM-3 (MW), were installed at the site, near existing fuel oil tanks. The monitoring wells installed for this project were open-stand pipe wells. The standpipe monitoring wells were constructed using 2-inch-diameter, Schedule 40 PVC pipe with machine-slotted screens. The screen interval was 15 feet in length at both wells. Screen slot size was 20 slot (0.020 inch). Prior to placement of the well screens, the boreholes were flushed with clean water. Native material was used to fill the boreholes to a depth of 25 feet below ground surface. A threaded end cap was attached to the bottom of the screens, which was then lowered down the borehole attached to lengths of solid 2-inch PVC riser pipe. Clean quartz sand was then poured slowly around the PVC to extend the filter pack approximately 1 to 3 feet above the top of the screen. A 1-foot layer of bentonite chips was used to seal off the filter pack. After the PVC pipe was cut off to be flush with the ground surface, the boreholes were grouted to the surface and covered with a protective road box. The bottom of the screen is approximately 25 feet bgs at both monitoring wells.

A summary of the groundwater levels at each monitoring well are presented in **Table 2-1.** The monitoring well logs, prepared by CDM Smith, is included in **Appendix C.**

2.3 Geotechnical Laboratory Testing

Laboratory tests were performed on select soil samples obtained from the recent test borings to characterize the physical, and engineering properties. Laboratory testing listed below was conducted at the CDM Smith Geotechnical Testing Laboratory in Cambridge, Massachusetts:

- Moisture Content (ASTM D-2216);
- Grain Size (ASTM D-422);
- Atterberg Limits (ASTM D-4318);
- Organic Content (ASTM D-2974);
- Laboratory Mini Vane Shear (ASTM D-4648); and
- Consolidation (ASTM D-4186).

The tests were performed in general accordance with the indicated ASTM standards. Moisture content tests were performed on twenty-nine (29) soil samples, grain size tests were performed on seventeen (17) soil samples, Atterberg Limits tests were performed on fourteen (14) soil samples, organic content tests were performed on six (6) soil samples, and consolidation tests were performed on two (2) soil samples from various locations and depths. The purpose of conducting these tests was to assist with soil classification, assess soil parameters to be used in engineering analyses, and assess the reuse potential of the soils to be excavated.

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Table 2-1
Summary of Monitoring Well Readings

Exploration No.	Approximate Ground Surface El. (ft)(2)	Approximate Riser El. (ft)(2)	Screen Depth (ft bgs)	Date of Reading	Time of Reading	Groundwater Depth Below Riser (ft)	Groundwater El.
CDM-2 (MW)	21	20.7	5 - 15	2/23/2015	2:30 PM	12.1	8.6
				2/24/2015	2:30 PM	6.2	14.5
				3/11/2015	6:00 AM	3.6	17.1
				3/13/2015	6:45 AM	5.1	15.6
CDM-3 (MW)	21	20.8	5 - 15	2/27/2015	3:00 PM	0.0	20.8
				3/1/2015	3:30 PM	4.7	16.1
				3/11/2015	6:30 AM	5.1	15.7
				3/13/2015	8:18 AM	6.0	14.8

Notes:
1. See Figure 2-1 for Monitoring Well locations.
2. Elevations are estimated based on existing drawings for the New Donnelly Field School, 1959.

A summary of the laboratory index test results are presented in **Table 2-2** and a summary of consolidation test is presented in **Table 2-3.** Laboratory test results are included are included in **Appendix C**.

Analytical testing on composite samples was conducted and results are presented in Section 5 of this report.

2.4 Subsurface Conditions

Subsurface soil conditions were interpreted from the test borings conducted as part of this study along with our understanding of the local geology. Test borings drilled across the site typically encountered a layer of asphalt or concrete over miscellaneous fill, locally present organic soils, sand and clay, and silty clay overlying glacial soils. A summary of subsurface explorations conducted for this study is presented in **Table 2-4**.

2.4.1 Asphalt and Concrete

Asphalt was encountered at 4 of the 6 test boring locations, excluding test boring location CDM-1 and CDM-3 (MW). Where encountered, the asphalt layer ranged in thickness from approximately 4 to 6 inches. At test boring locations CDM-1 and CDM-3 (MW), concrete was encountered and ranged in thickness from approximately 8 to 9 inches thick.

2.4.2 Fill

Fill was encountered at all of the recent test boring locations (CDM-1 through CDM-6) and at all of the previous test boring location (A-1 through H-4).

At the previous test boring locations, the stratum ranged from approximately 5.5 to 10 feet thick and consisted of loose to firm, loamy sand with various amount of gravel, clay, and sand. Cinders were encountered at 14 of the previous test boring locations (B-1, C-1, C-3, C-4, C-6, D-1, E-1, E-2, E-3, F-1, F-2, F-3, G-2, and H-1). Red brick was encountered at 5 of the previous test boring locations (B-1, F-3, F-4, G-3, and G-4). Trace amounts of peat were encountered within the Fill strata at two of the previous test boring locations (E-1 and G-1).

At the recent test boring locations, the fill stratum consisted of dry to wet, loose to very dense, fine to coarse SAND, trace to and fine to coarse gravel, trace to some silt to silty clay. Trace amounts of roots as well as a trace amounts of burnt ash and cinders were encountered in the fill strata at boring location CDM-1. Additionally, brick fragments were encountered at test boring locations CDM-5 and CDM-6.

The fill stratum ranged from approximately 7.5 to 9 feet thick at the recent test boring locations. SPT N-Values ranged from 9 to 96 blows per foot (bl/ft) with an average value of approximately 29 bl/ft at the recent test boring locations.

2.4.3 Organic Soil

An organic soil stratum was encountered at 6 of the previous test boring locations (B-3, E-1, F-2, F-3, H-3, and H-4). The stratum generally consisted of PEAT with various amounts of sand to Peaty Sand and ranged from approximately 1 to 3.5 feet thick.

No organic soil stratum was encountered at any of the recent test boring locations.

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Table 2-2
Summary of Geotechnical Index Test Results

Exploration Number	Sample Number	Sample Depth (ft)	Strata	USCS Classification (1)	Grain Size Analysis (2) Gravel (%) Coarse	Gravel (%) Fine	Sand (%) Coarse	Sand (%) Medium	Sand (%) Fine	Fines (%) Silt	Fines (%) Clay	Atterberg Limits (3) LL (%)	PL (%)	PI (%)	Moisture Content (%) (4)	Organic Content (%) 5
CDM-1	S-4	7-9	Fill	SW-SM	0.0	2.9	4.0	28.3	53.1	10.3	1.4	-	-	-	17.5	-
CDM-1	S-5B	9-11	Sand and Clay	CL	-	-	-	-	-	-		40.0	21.0	19.0	25.4	1.9
CDM-1	S-7	13-15	Silty Clay	CL	-	-	-	-	-	-		41.0	22.0	19.0	32.6	-
CDM-1	S-13	30-32	Silty Clay	CL	-	-	-	-	-	-		41.0	21.0	20.0	44.8	-
CDM-2 (MW)	S-1	1-3	Fill	SM	0.0	10.8	7.9	21.5	32.3	27.5		-	-	-	25.5	-
CDM-2 (MW)	S-5	9-11	Sand and Clay	CL	0.0	0.0	0.0	1.2	1.1	31.2	66.5	-	-	-	24.5	-
CDM-2 (MW)	S-7	13-15	Sand and Clay	CL	-	-	-	-	-	-		48.0	22.0	26.0	31.9	1.8
CDM-2 (MW)	S-15	39-41	Silty Clay	CL	-	-	-	-	-	-		39.0	21.0	18.0	30.5	-
CDM-2 (MW)	S-16	44-46	Glacial Soils	SM	0.0	22.9	19.2	29.2	10.1	18.6		-	-	-	13.5	-
CDM-3	S-3A	5-7	Fill	SM	0.0	23.0	6.5	18.1	24.0	15.8	12.6	-	-	-	13.8	-
CDM-3	S-6	11-13	Silty Clay	CL	0.0	8.1	2.1	1.4	3.4	32.2	52.8	-	-	-	27.1	-
CDM-3	S-12	23-25	Silty Clay	CL	-	-	-	-	-	-		47.0	22.0	25.0	40.9	-
CDM-3	S-19	60-62	Glacial Soils	SM	0.0	27.8	15.6	13.7	10.2	32.7		-	-	-	12.7	-
CDM-4	S-3	5-7	Fill	SM	12.8	13.6	11.0	25.5	21.2	15.9		-	-	-	23.7	-
CDM-4	S-4B	7-9	Sand and Clay	ML	0.0	0.1	0.1	7.4	28.2	50.5	13.7	-	-	-	14.9	-
CDM-4	S-5	9-11	Sand and Clay	ML	0.0	2.6	0.3	12.1	31.5	41.0	12.5	-	-	-	24.7	1.9
CDM-4	S-6	11-13	Sand and Clay	SM	0.0	1.0	1.3	17.9	45.6	22.2	12.0	-	-	-	17.4	-
CDM-4	S-9	17-19	Silty Clay	CL	-	-	-	-	-	-		43.0	21.0	22.0	38.3	-
CDM-4	U-2	46-48	Silty Clay	CL	0.0	0.0	0.0	0.0	0.1	27.2	72.7	37.0	22.0	15.0	37.4	-
CDM-4	S-20	59-61	Silty Clay	CL	-	-	-	-	-	-		32.0	17.0	15.0	18.3	-
CDM-5	S-5	9-11	Sand and Clay	ML	0.0	0.0	0.1	1.4	3.1	54.1	41.3	-	-	-	24.5	1.4
CDM-5	S-7B	13-15	Sand and Clay	CL	-	-	-	-	-	-		30.0	19.0	11.0	24.2	1.9
CDM-5	U-1	19-21	Silty Clay	CH	0.0	0.0	0.0	0.1	0.2	18.5	81.2	59.0	22.0	37.0	37.0	-
CDM-5	S-17	49-51	Silty Clay	CL	0.0	0.0	0.1	0.1	0.2	21.2	78.4	-	-	-	37.1	-
CDM-5	S-18	54-56	Silty Clay	CL	-	-	-	-	-	-		36.0	19.0	17.0	33.2	-
CDM-5	S-19	64-66	Glacial Soils	SC	6.7	22.6	14.3	11.8	3.5	13.6	27.5	-	-	-	20.8	-
CDM-6	S-5	8-10	Sand and Clay	ML	0.0	0.4	0.6	5.8	34.4	41.2	17.6	-	-	-	18.8	1.0
CDM-6	S-8	14-16	Silty Clay	CL	-	-	-	-	-	-		43.0	22.0	21.0	32.7	-
CDM-6	S-15	35-37	Silty Clay	CL	-	-	-	-	-	-		40.0	22.0	18.0	33.9	-

Notes:
1. USCS classifications were performed in accordance with ASTM D-2488.
2. Grain size analysis tests performed in accordance with ASTM D-422.
3. Atterberg limit tests performed in accordance with ASTM D-4318.
4. Moisture content analysis performed in accordance with ASTM D-2216.
5. Organic content tests performed in accordance with ASTM D-2974.

Abbreviations:

--	Test Not Performed
ML	Silt
SM	Silty Sand
SW-SM	Well-graded sand with silt
CH	Fat Clay
CL	Lean Clay
SC	Clayey Sand

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Table 2-3
Summary of Consolidation Test Results

Exploration No.	Sample No.	Sample Depth (ft)	Strata	Initial Dry Density, γ_d (pcf)	Water Content (%)		Void Ratio		Interpreted Pre-consolidation Pressure, σ'_p (psf)	Estimated Effective Vertical Stress, σ'_{vo} (psf)	OCR [1]	Compression Ratio	Recompression Ratio	Coefficient of Consolidation, Cv (ft^2/yr)	
					Initial, w_o	Final, w_f	Initial, e_o	Final, e_f				$C_{c\varepsilon}$ [2]	$C_{r\varepsilon}$ [3]	Min (Typical)	Max (Typical)
CDM-4	U-2	47	Silty Clay	80	42.6	31.1	1.12	0.73	5,400	3,692	1.5	0.212	0.030	20	80
CDM-5	U-1	20	Silty Clay	82	40.1	35.4	1.10	0.79	4,800	1,621	3.0	0.129	0.034	54	118

Notes:
1. OCR = Overconsolidation Ratio, σ'_p / σ'_{vo}
2. $C_{c\varepsilon}$ = Virgin compression ratio
3. $C_{r\varepsilon}$ = Recompression ratio
4. Constant Rate of Strain (CRS) tests were performed in accordance with ASTM D4186.

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Table 2-4
Summary of Subsurface Exploration Program

Exploration Number	Approximate Ground Surface Elevation (ft) (2)	Exploration Depth (ft)	Strata Thickness (ft)					Depth to Groundwater (ft)(1)	Approx. Groundwater Elevation (ft) (2)
			Fill	Organic Soils	Sand and Clay	Silty Clay	Glacial Soils		
Previous Test Boring Locations (MA Dyer Company, 1959)									
A-1	20.86	51	8.5	NE	4.5	33	>5	7	13.86
A-2	20.77	46	7.5	NE	2	31.5	>5	7	13.77
B-1	21.05	60	6.5	NE	4	44	>5.5	7	14.05
B-2	21.08	59	7	NE	1	46	>5	8	13.08
B-3	20.96	54	7	1	NE	44	>2	8	12.96
B-4	20.7	54.5	7	NE	3	39.5	>5	8	12.7
C-1	21.51	60	7.5	NE	2	45.5	>5	6	15.51
C-2	20.78	62	8	NE	2.5	46.5	>5	6	14.78
C-3	20.84	63.5	7.5	NE	3	48	>5	5.5	15.34
C-4	21.07	62.5	7.5	NE	3	47	>5	5.5	15.57
C-5	21	62	8.5	NE	2	46.5	>5	5.25	15.75
C-6	21.05	57.5	8.5	NE	3.5	40.5	>5	6	15.05
D-1	21.97	64	7	NE	5	46.5	>5.5	6	15.97
E-1	21.33	64	5.5	1.5	7	45	>5	6.2	15.13
E-2	20.78	65	6	NE	7	47	>5	6	14.78
E-3	20.73	57	7	NE	1.5	43.5	>5	4	16.73
F-1	21.38	66	9	NE	NE	52	>5	4.5	16.88
F-2	22.44	68	7	2.5	NE	54	>4.5	4.5	17.94
F-3	21.79	64.5	7	1.5	2	49	>5	6.5	15.29
F-4	70.95	21	9.5	NE	4	>7.5	NE	8.5	62.45
F-5	70.95	25	10	NE	5	>10	NE	3.5	67.45
G-1	21.24	57	7.5	NE	5	39.5	>5	3.5	17.74
G-2	20.73	53.5	8	NE	NE	40.5	>5	7	13.73
G-3	20.95	20	10	NE	NE	>10	NE	5.5	15.45
G-4	20.95	22	10	NE	8	>4	NE	1.5	19.45
H-1	21.24	61.5	8	NE	2	46.5	>5	4.5	16.74
H-2	21.01	68	7	NE	2	54	>5	3.5	17.51
H-3	21.09	63	10	2	1.5	44.5	>5	5	16.09
H-4	21.03	62	5.5	3.5	7	41	>5	3.5	17.53

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Table 2-4
Summary of Subsurface Exploration Program

Exploration Number	Approximate Ground Surface Elevation (ft) (2)	Exploration Depth (ft)	Strata Thickness (ft)					Depth to Groundwater (ft)(1)	Approx. Groundwater Elevation (ft) (2)
			Fill	Organic Soils	Sand and Clay	Silty Clay	Glacial Soils		
Recent Test Boring Locations (CDM Smith, 2015)									
CDM-1	21	56	9.0	NE	3.0	34.0	>10	NR	NR
CDM-2	21	53	8.5	NE	6.5	27.5	>10.5	12.1	8.9
CDM-3	21	69	8.0	NE	NE	50.5	>10.5	4.7	16.3
CDM-4	21	68	7.5	NE	7.5	47.5	>5.5	17.5	3.5
CDM-5	21	71	9.0	NE	6.0	45.5	>10.5	7.0	14.0
CDM-6	21	58.5	7.5	NE	3.0	32.0	>16	NR	NR

Notes:
1. Groundwater levels were measured at the time of drilling.
2. Elevations are estimated based on existing drawings for the New Donnelly Field School, 1959.

Abbreviations:
NE - Not Encountered
NR - Not Recorded

2.4.4 Sand and Clay

A Sand and Clay stratum was encountered at all of the recent test boring locations, excluding CDM-3 (MW), and at most of the previous test boring locations, excluding boring locations F-1, F-2, G-2, and G-3.

At the previous test boring locations, the Sand and Clay stratum ranged from approximately 1 to 8 feet thick and consisted of loose to firm to hard, medium sand with very little to little gravel and various amounts of stones, clay, and inorganic silt.

At the recent test boring locations, the Sand and Clay stratum consisted of medium dense to very dense, fine to coarse SAND, little to and fine to coarse gravel, little to some clayey silt to very stiff to hard, Slightly Organic CLAY and SILT to Silty CLAY, trace to and fine to coarse sand, none to little fine gravel. The Sand and Clay stratum, at the recent test boring locations, ranged from approximately 3 to 7.5 feet thick. SPT N-Values ranged from 14 to 71 blows per foot (bl/ft) with an average value of approximately 30 bl/ft at the recent test boring locations.

2.4.5 Silty Clay

Silty clay was encountered at all of the recent test boring locations (CDM-1 through CDM-6), and at all of the previous test boring locations.

At the previous test boring locations, the silty clay generally consisted of soft to medium, blue, CLAY, with none to little fine sand. At 9 of the previous test boring locations (B-1, B-2, E-3, F-1, F-2, F-3, G-2, H-1, and H-2), a medium, yellow to yellow & blue, clay with various amounts of sand was encountered directly below the sand and clay layer and above the blue clay. The yellow clay ranged in thickness from approximately 2 to 6 feet thick.

The silty clay stratum was not fully penetrated at all of the previous test boring locations. At the test boring locations where the silty clay stratum was fully penetrated the stratum thickness ranged from approximately 31.5 to 54 feet thick. Where the stratum was not fully penetrated, the thickness ranged from approximately greater than 7.5 feet to greater than 10 feet.

The silty clay was encountered at all of the recent test boring locations. The upper portion of the silty clay generally consisted of wet, stiff to very stiff, Silty CLAY, trace to little fine sand with SPT N-values typically ranging from about 4 bl/ft to 22 bl/ft with an average N-value of 10 bl/ft. The thickness of the upper layer ranged from approximately 23 to 39 feet.

The lower portion of the silty clay generally consisted of wet, very soft to medium stiff, Silty Clay with trace the strata generally consisted of wet, very stiff to very soft, gray, Silty CLAY, trace to little fine to coarse sand. The SPT N-values typically ranged from weight of rod (WOR) to 7 bl/ft with an average N-value of 2 bl/ft. The thickness of the lower silty clay layer ranged from approximately 30 to 38.5 feet.

2.4.6 Glacial Soils

Glacial soils were encountered at most of the previous test boring locations, (excluding test boring locations F-4, F-5, G-3, and G-4) and at all of the recent test boring locations (CDM-1 through CDM-6).

At the previous testing boring locations, glacial soils were encountered approximately 41 to 63.5 feet bgs and consisted of hard to firm, fine to coarse sand and gravel with various amounts of clay. The glacial soil stratum was not fully penetrated at any of the previous test boring locations and ranged from approximately greater than 2 feet to greater than 5.5 feet thick.

The glacial soil strata at the recent test boring locations generally consisted of wet, medium dense to very dense, fine to coarse SAND, some to and fine to coarse GRAVEL, little to and CLAY and SILT. The glacial soil layer was not fully penetrated at any of the recent test boring locations. The stratum ranged from greater than 5.5 feet to greater than 16 feet. SPT N-values ranged from 16 bl/ft to greater than 100 bl/ft with an average of 76 bl/ft.

2.4.7 Groundwater Conditions

Groundwater levels measured in the borehole were recorded at the completion of drilling in four (4) of the six (6) test boring locations (CDM-2 (MW) through CDM-5). Where encountered at the time of drilling, groundwater depths ranged from approximately 4.7 to 17.5 feet below ground surface, (approximately El. 3.5 to El. 16.3). At location CDM- 2 (MW), the groundwater was measured on February 23, February 24, March 11 and March 13, 2015 and was observed to range from approximately 3.5 to 12.1 feet below ground surface (approximately El. 17.5 to El. 8.9). At location CDM- 3 (MW), the groundwater was measured on February 27, March 1, March 11 and March 13, 2015 and was observed to range from ground surface to approximately 6 feet below ground surface (approximately El. 21 to El. 15).

2.5 Expected Variations in Subsurface Conditions

Interpretation of general subsurface conditions presented herein is based on soil and groundwater conditions observed at the test boring locations conducted for this study. However, subsurface conditions may vary between exploration locations. If conditions are found to be different from what is indicated herein, recommendations contained in this report should be reevaluated by CDM Smith and confirmed in writing.

Groundwater levels can be expected to change with time, season, temperature, and construction activities in the area, as well as with other factors. Therefore, groundwater conditions at the time of construction may be different from those found during the exploration program.

Section 3

Preliminary Geotechnical Evaluation and Design Recommendations

3.1 Geotechnical Engineering Evaluations

In general, preliminary geotechnical engineering evaluations and recommendations have been based on the result of field and laboratory testing programs conducted for this study, published correlations with soil properties and the minimum requirements of the 2009 International Building Code and the 8th edition of the Massachusetts Building Code (the Code). In addition, recommended design criteria are based on performance tolerances, such as allowable settlement, as understood to relate to similar structures.

The following preliminary geotechnical considerations and recommendations assume that the project will include the demolition of the existing school and community center complex and construction of new school buildings. It is assumed that the new school buildings would have a similar overall size to the existing structures and have one level of underground garage or basement throughout all structures with up to three stories above grade. For the purposes of preliminary design, it is assumed that the new building would be supported by spread footings with typical column loads of approximately 250 kips and 30-foot by 30-foot typical column spacing. These considerations and recommendations may not be applicable if the new structures do not have a below-ground level or are taller than 3 stories.

3.1.1 Geotechnical Considerations

The following discussion highlights some of the primary geotechnical considerations for the major project components, but is not intended to be a comprehensive listing of all geotechnical issues:

- Miscellaneous fill may be encountered from ground surface to depths between approximately 5 and 10 feet below ground surface. These materials are unsuitable for support of the foundations and where present below new foundations will require over-excavation and replacement with compacted fill.

- Limited thickness of organic soils was encountered in localized areas during previous subsurface exploration at about 5 to 10 feet below ground surface. These materials are unsuitable for support of the foundations and if present below new foundations will require removal and replacement with compacted fill. It is assumed that the new structures with one level below-grade will extend below this organic soils layer.

- The existing school structures typically have a crawl space that extends to El. 17 to 19. Backfilling of the crawl space is not currently anticipated and would result in additional soil loads on the area.

- The southern part of the existing school structure is supported on timber piles, which suggests the potential for different subsurface conditions or structural loading conditions in that area.

- The depth of excavation is anticipated to be in the range of approximately 10 to 17 feet below ground surface for the construction of one below-grade level. Excavation support systems may be required due to space constraint and other limitation.
- Groundwater was typically encountered between 3.5 and 8 feet below ground surface, which is anticipated to be above the bottom of the new school structures.
- Marine clay was encountered in the all previous and recent subsurface exploration locations between 8 and 15 feet below ground surface. This layer is susceptible to settlements due to additional structure (foundation) and fill loads.

3.2 Preliminary Foundation Design Recommendations

3.2.1 General

The proposed new school structure(s) may be supported on spread footings bearing on suitable foundation bearing soils. Suitable foundation bearing soils consist of the naturally deposited, undisturbed Silty Clay or inorganic Sand and Clay strata or compacted structural fill placed after the removal of unsuitable soils. Unsuitable soils include existing fill, organic soils, or any loose or disturbed soils present at foundation subgrade level.

Foundations for the proposed structures may be designed for a maximum bearing pressure of 3.0 kips per sq. ft. (ksf), provided they bear on the suitable bearing soils, or on structural fill placed directly over suitable materials. Where the structure is founded on structural fill, the fill should extend at least 2.0 ft. beyond the edge of the foundation, then outward and downward at a slope of one horizontal to one vertical (1H:1V) to suitable bearing soils.

3.2.2 Foundation Depth

In accordance the Code, foundations below unheated areas or adjacent to exterior ground surfaces should bear no less than 48 inches below any adjacent ground surface exposed to freezing. Interior footings within heated areas should bear at least 18 inches below the top of slab.

3.2.3 Lowest Level Floor Slab

Lowest level slabs should be designed as slabs on grade or mat foundations bearing on a minimum of 12-inches of compacted structural fill over suitable bearing soil unless otherwise specified.

3.2.4 Earthquake Considerations

For the purpose of determining design earthquake forces for the proposed structures in accordance with Section 1613.5.3 of the Code, the site should be considered as Site Class D. Therefore, the spectral accelerations shall be modified for Site Class D when determining the design earthquake response accelerations and seismic design category for the seismic analysis at the site.

Based on the subsurface investigation, the soils encountered beneath the structure foundations at the site are not considered susceptible to liquefaction.

3.2.5 Estimated Foundation Settlement

Settlement of the proposed structures, with maximum bearing pressures of 3.0 ksf loads and designed as recommended herein, are expected to be around 2 to 3 inches with up to 1.5 inches of differential settlement. The estimated foundation settlement presented herein is based on assumed loading conditions for similarly sized structures with foundation depth and loading as indicated on Section 3.1 and will need to be evaluated with a more refined settlement analysis during final design that includes the actual foundation loads, structure size and depth.

3.2.6 Design Groundwater

The site is located outside the 100-year flood plain. The groundwater levels measured in the previous and recent test borings ranges between 1.5 feet and 17.5 feet bgs at the time of drilling. The groundwater levels were also measured in monitoring wells CDM-2 (MW) and CDM-3 (MW) to be 3.6 feet to 6.2 feet bgs in March 2015 after the wells were installed for more than 1 day. For the purpose of design, the design groundwater level should be assumed to be 3 feet below ground surface.

3.2.7 Resistance to Buoyancy, Underdrains and Perimeter Drainage

Any portion of a structure that extends below the design groundwater level will either require a perimeter and underdrainage system or should be appropriately waterproofed and designed to resist buoyancy from hydrostatic pressure based on the design groundwater level.

The dead weight of the structure and the weight of any backfill directly above the foundation may be used to resist buoyancy. Soil used as backfill should be assumed to have a total unit weight of 120 pounds per cubic foot (pcf).

Assuming the proposed structures will include below grade garage, perimeter and underdrainage system will be needed. Perimeter and underdrains should consist of perforated PVC pipe, encased in drainage stone (minimum of 6 inches on all sides for perimeter drains and 12 inches thick for underdrains) and wrapped with a non-woven filter fabric to help prevent migration of fines into the drainage system. The drainage stone should consist of a clean, 3/4-inch minus crushed stone. Drains beneath the structures should be spaced no greater than 40 feet on center. The underdrains should be connected to a perimeter drain.

The minimum recommended drain size for the underdrain and perimeter drain pipes is 4 inches in diameter. Perimeter drains that serve as a header to drain other structures should be at least 6 inches in diameter. All perimeter drains and headers should be sloped at least 0.5 percent. The discharge pipe should be solid and sloped at least 1.0 percent to the discharge. The site grading will need to be checked to verify that the site allows for gravity drainage of the discharge pipe.

3.2.8 Lateral Pressure on Below-Grade Walls

Below-grade walls that are backfilled on one side and restrained against rotation at the top, should be designed for lateral pressures from soil and groundwater based on an equivalent fluid unit weight of 60 pounds per cubic foot (pcf) above the design groundwater level and 90 pcf below the design groundwater level.

A lateral pressure equal to 0.5 times surface vertical surcharge loads from building foundations, slabs or other loads should be applied over the full height of all walls. Earthquake induced pressures in accordance with Section 1613.0 of the Code should be included in the design of all below grade walls.

3.2.9 Resistance to Unbalanced Lateral Loads

Unbalanced lateral loads should be designed to be resisted by friction on the bottom of the foundation. For purposes of design, a coefficient of friction of 0.35 should be used. It is expected that the available friction will be sufficient to resist all unbalanced lateral loads. However, should lateral loads exceed the friction available, the surplus loads may be resisted by passive pressures on the foundations, provided the walls/footings are appropriately designed for the pressures. A passive pressure resistance of up to a maximum equivalent fluid pressure of 150 pcf may be assumed, provided the foundations are backfilled with structural fill compacted to a density of at least 95 percent of the maximum dry density as determined by laboratory test ASTM D1557. The resistance from the upper 2 feet of soil should be neglected, due to surface effects and potential for disturbance due to frost action and other factors. Frictional resistance should be assumed to be mobilized first and to its full capacity before any passive pressure is developed.

3.3 Settlement Considerations

The preliminary recommendation on foundation type is contingent upon the estimated foundation settlement presented above can be accommodated.

If the existing site grades are raised or structures are founded at grade with existing crawl spaces backfilled, additional settlement of the site should be anticipated. A raise in grade and resulting settlements should be expected to impact proposed foundation systems. If site grades are proposed to be increased, an evaluation of the resulting settlement and impacts on existing and proposed structures should be conducted. If structure settlements resulting from an increase of existing grade cannot be accommodated, pile foundations may be necessary.

3.4 Additional Geotechnical Explorations and Evaluation

Considering the existing subsurface conditions which consist of compressible silty clay and high groundwater, and potential for foundation settlement, additional geotechnical explorations and laboratory testing will be required for final design of this project. Between 6 and 8 additional test borings are anticipated to be required depending on the final building location and geometry and anticipated loads. Additional Shelby tube samples and laboratory testing, including consolidation tests and index tests should be obtained and conducted. An additional monitoring well may also be required for final design.

As the project progresses, these preliminary foundation recommendations should be further evaluated based on updated foundation size, spacing, loading and depth proposed for the new school structures.

Section 4

Preliminary Construction Considerations

4.1 General

The purpose of this section is to discuss issues related to geotechnical aspects of construction as required for development of the project specifications. Included are anticipated methods of construction and identification of potential construction related problems. The Contractor will be required to base cost estimates on an independent interpretation of the subsurface conditions.

The following preliminary construction considerations assume that the project will include the demolition of the existing school and community complex and the design and construction of new school buildings as described in Section 3. These considerations and recommendations may not be applicable if the proposed construction is different than assumed.

4.2 Demolition

Demolition of the existing school and community center complex is anticipated as part of the project. Demolition should be conducted in a controlled manner to limit impact to the nearby utilities, roadways, and structures. Based on the available drawings, the southern part of the existing school building is support by pressure-treated wood piles of unknown length and less than 12 inches in diameter, with pile cutoff at El. 12. To avoid creating voids below the new structures, we recommend the concrete pile cap be removed but the existing timber piles not be pulled. Instead the timber piles should be cut to at least 2 feet below the lowest foundation level and abandoned in place.

4.3 Excavation

We anticipate that foundation excavations can be made using conventional earthmoving equipment. Some excavations may require excavation support to limit excavations quantities, maintain work within site boundaries, assist in the control of groundwater, and to protect adjacent existing facilities. Recommendations pertaining to excavation support systems are discussed herein. Where open excavations are feasible, the side slopes should be designed in accordance with OSHA regulations.

Unsuitable soils extending about 6 to 12 feet below ground surface were encountered at most of the previous and recent test boring locations. Unsuitable soils consisting of fill, organic soils, or other loose or disturbed soil encountered at or below proposed foundation elevations will need to be removed. It is our understanding that all new buildings will extend one level below grade or to a depth of about 12 to 17 feet bgs, therefore most of the unsuitable materials are anticipated to be removed as a result.

Excavations should not extend into the zone of influence of any existing utilities and/or structures. The zone of influence is defined as extending 2.0 feet beyond the bottom exterior edge of the foundation or springline of pipe then down and away at a one horizontal to one vertical (1H:1V) slope. Existing utilities around the site should be reviewed prior to excavation. Undermining of existing foundations must not occur.

4.4 Excavation Support System

The use of excavation support systems will be necessary where there is not sufficient space to allow the excavation side slopes to be laidback to allow the excavation to be performed as an open cut. The design of the excavation support systems should performed by a professional engineer registered in the Commonwealth of Massachusetts under the employment of the contractor. The design of the excavation support systems should be performed in conjunction with the design of the dewatering systems.

Excavation support systems may consist of interlocking steel sheeting or soldier pile and lagging. The interlocking steel sheeting will provide better groundwater cutoff than the soldier pile and lagging option. The selection of the type of excavation support system will be performed by the contractor. Trench boxes may be sufficient for some of the shallow trench excavations.

Any sheeting installed within the zone of influence of any existing or new structures, utilities or pipelines should be left in place to avoid disturbing bearing soils as a result of the sheeting removal process. The zone of influence of facilities is defined as a line extending at least 2.0 feet beyond the edge of the foundation of any structure or the spring line of any utility or pipeline, then outward and downward at a slope of 1 horizontal to 1 vertical. Any sheeting or soldier piles left in place should be cut off at least 5 feet below the adjacent finished grade.

4.5 Dewatering

Excavations for construction of the building will likely extend below the existing groundwater level. The contractor will be responsible to design and implement a dewatering system that maintains a dry, undisturbed and stable subgrade. The design of the dewatering system should be performed by a registered professional engineer within the Commonwealth of Massachusetts. We recommend that the groundwater level inside the excavation be maintained at least 2 feet below the lowest excavation level.

The dewatering system should be designed in conjunction with the excavation support system selected by the contractor. Depending on the excavation support system selected, wells, well points and/or pumping from open sumps within the excavation may be required. Wells, well points and sumps must be adequately filtered to avoid loss of fines.

The contractor must be prepared to operate the dewatering system continuously, as required to complete the work and avoid floatation or uplift prior to completion of the new work. During periods where failure of the system would adversely impact the work completed, the contractor should be able to provide a back-up system to ensure continuous operation when necessary.

The contractor must design the dewatering system to not adversely impact adjacent structures, utilities or other site features. All dewatering, handling and disposal of pumped water and any special testing should be conducted in accordance with local regulations, permits and specified requirements.

If wet weather is encountered during construction, the Contractor should schedule excavations to limit the duration of open cuts, slope the bottoms of the excavations to facilitate drainage and provide berms to limit runoff into the excavations. In addition, excavated material to be reused as fill should be stockpiled in a manner that promotes runoff and limits saturation of the materials.

4.6 Protection and Preparation of Subgrade Soils

Care should be taken to avoid excess traffic on the excavated subgrade prior to placement of concrete foundations and backfill material. The exposed subgrade should be protected against precipitation and the subgrade should not be allowed to freeze.

Where structure foundation subgrades are at naturally deposited granular soil, the subgrade should be proof-rolled with at least four passes of a vibratory compactor prior to placement of structural fill or concrete foundations. Any unsuitable material present at the subgrade level should be removed and replaced as described herein.

Proof rolling should not be conducted where the subgrade consists of cohesive soil (silt or clay), however, a smooth edge bucket should be used for final excavation in such soil. Where the subgrade consists of cohesive soil the undisturbed subgrade should be protected with a minimum 4-inch thick lean concrete mud mat or a minimum 12-inch layer of compacted crushed stone wrapped in filter fabric.

4.7 Protection of Existing Structures

Demolition and excavation activities will be made adjacent to existing roadways and utilities, and in close proximity to residential and commercial buildings. Protection of existing facilities is the responsibility of the Contractor. The Contractor must take adequate measures to protect existing structures, roadways and utilities from movement.

4.7.1 Pre-construction Survey

Prior to start of demolition, excavation, installation of excavation support, and dewatering work, a pre-construction survey of existing adjacent residences, structures and conditions should be performed. The survey shall consist of a description of interior and exterior conditions. Descriptions shall locate cracks, damage or other defects existing and shall include information to make it possible to determine the effect, if any, of the construction operations on the defect. Where significant cracks or damage exists, or for defects too complicated to describe in words, photographs shall be taken and made part of the record. Contractor's record of the pre-construction survey shall consist of written documentation, video and photographs of the conditions identified. At the completion of the survey, submit copies of the documentation to the Owner.

4.7.2 Settlement Monitoring

We recommend that settlement monitoring points be established on adjacent existing structures, roadways, and utilities. The points should be monitored during the installation of excavation support system, dewatering, demolition, excavation and backfilling work associated with the work. The points should be installed and baseline elevations taken prior to the start of demolition and construction. The survey of the monitoring points should be performed daily during structural demolition, installation of excavation support system, excavation and dewatering, and then twice weekly thereafter until all backfilling is complete.

The Contractor should be prepared to alter the excavation methods if settlement exceeding 1/4 inch is measured at the existing structures. If settlement exceeding 1/2 inch is measured at the existing structures, the Contractor should stop all construction activities, stabilize the excavation and revise excavation methods to prevent additional settlement.

4.7.3 Vibration Monitoring

Ground vibrations due to construction activities such as demolition of the existing structures or pile driving for support of excavation systems can cause damage to adjacent structures, utilities and other facilities. To avoid or mitigate this potential damage, limits on ground vibrations in the form of ground displacement, velocity or acceleration at given frequencies are typically established. The Bureau of Mines has established criteria to limit ground vibrations using the peak particle velocity (PPV) and frequency parameters. These limits have been established using the cracking of plaster walls in a residential house as a model.

The maximum peak particle velocities associated with impact or vibratory pile installation methods at the ground surface at existing adjacent structures and utilities should be as follows:

Maximum Frequency (Hz)	Peak Particle Velocity (in. per. sec.)
Over 40	2.0
30 to 40	1.5
20 to 30	1.0
Less than 20	0.5

In no case should the maximum peak particle velocities caused by construction activities exceed 2.0 inches per second at the closest facility (structure or utility) to the work.

A minimum of two seismographs should be located at adjacent/nearby structures and utilities during all structural demolition and pile driving activities to confirm compliance with the recommendations herein and record actual impact vibrations.

4.8 Backfill Materials

4.8.1 Crushed Stone

Crushed stone used as drainage material or alternatives to structural fill, should consist of clean, durable, sharp-angular fragments of rock of uniform quality free from sand, loam, clay, excess fines and other deleterious materials and shall comply with the requirements of the Massachusetts Highway Standard Specifications for Highways and Bridges M2.01.4.

4.8.2 Structural Fill

Granular fill used as structural fill below footings and slab-on-grade should consist of a mineral soil free of organic material, loam, debris, frozen soil or other deleterious material which may be compressible or which cannot be properly compacted. Structural fill should conform to the following gradation requirements:

U.S. Standard Sieve Size	Percent Passing by Weight
3 inches	100
No. 4	20-70
No. 40	5-35
No. 200	0.10

Structural fill should be placed in layers no thicker than 8 inches, as placed, and compacted with suitable compaction equipment to at least 95 percent of maximum dry density as determined by ASTM D1557. Lift thickness should be reduced to 4 inches in confined areas accessible only to hand guided compaction equipment

4.8.3 Common Fill

Common fill used as fill or backfill materials outside of building footprint, below parking areas, and landscaped areas should consist of granular soil free of organic material, topsoil, debris, frozen soil or other deleterious material that cannot be properly compacted. It should contain stones no larger than 6 inches and have no more than 30 percent of material passing the No. 200 sieve. It should be placed in layers not to exceed 12 inches, as placed, and compacted with suitable vibratory compaction equipment to at least 92 percent of maximum dry density as determined by ASTM D1557. Lift thickness should be reduced to 6 inches in confined areas accessible only to hand guided compaction equipment.

4.8.4 Filter Fabric

Filter fabric used to separate crushed stone and fine-grained soils, and as specified elsewhere should be non-woven geotextiles, Mirafi 160N or approved equivalent.

4.9 Construction Monitoring

It is recommended that a qualified Geotechnical Engineer, experienced technician under the direction of the Geotechnical Engineer, or experienced Resident Engineer be present during construction to confirm that the Contractor complies with the intent of these recommendations. Specifically, the field representative would undertake the following responsibilities:

- Monitor the installation of excavation support systems;
- Confirm that appropriate dewatering and surface water control methods are employed;
- Confirm removal of unsuitable materials present at foundation subgrade level and replacement with backfill material;
- Confirm that the foundation subgrades are prepared and conditions encountered ate suitable for support of the proposed structures; and
- Observe, test and document placement and compaction of backfill material where appropriate.

In addition, the field representative would be present to identify and provide response should conditions encountered differ from those assumed during preparation of this report.

Section 5

Environmental Evaluation

Prior to the start of the onsite environmental and geotechnical investigations, CDM Smith conducted a preliminary search on the Massachusetts Department of Environmental Protection (MassDEP) web site and there do not appear to be any listed sites in the immediate vicinity of the property. A more thorough search will be conducted as part of an ASTM Phase I assessment which will be prepared as a separate, standalone document. Potential sources of environmental contamination on the property that have been initially identified are two underground storage tanks shown on the existing conditions drawings as well as historic urban fill material which is typically found in this area. These potential sources were investigated as part of the environmental site assessment conducted in February 2015 as part of the geotechnical drilling program. The results of this environmental investigation are presented below.

5.1 Environmental Investigation

As discussed in Section 2, CDM Smith advanced six (6) soil borings and completed two (2) boring locations as monitoring wells during the site investigation conducted in February 2015. The two soil boring locations that were completed as monitoring wells are locations CDM-2 and CDM-3. One well, CDM-2 is located in a paved area accessed from Berkshire Street which is currently used as a parking lot for teachers at the school. The second well, CDM-3, is located at the edge of a sidewalk located on Willow Street, behind a loading dock area for the King Open School. Both monitoring wells installed for this project were completed at the ground surface with flush mounted road boxes. Environmental soil samples were collected during drilling at each of the six soil boring locations. The groundwater monitoring wells were developed and then subsequently sampled following their installation during drilling.

During the course of the investigation, excess soil generated during drilling that could not be used to backfill locations upon the completion of the investigation were temporarily stored onsite in a 55-gal steel drum. Based on the results of the soil samples submitted for analysis, discussed in Section 5.2, the waste was profiled and transported offsite by US Ecology on April 10, 2015. The drum disposal manifest is included as **Appendix E.**

5.2 Environmental Data Summary

During the soil boring program conducted in February 2015, CDM Smith collected soil samples from six boring locations as shown on Figure 2-1. In addition, groundwater samples were collected from newly installed monitoring wells CDM-2 and CDM-3. All groundwater and soil samples were submitted to Alpha Analytical Laboratories (Alpha) in Westborough, Massachusetts for laboratory analysis.

The purpose of the sampling and analysis was to determine the chemical quality of on-site soils and groundwater at the property. The chemical quality of the soils may impact on-site soil reuse and/or off-site disposal which may have implications in regard to project cost and schedule. Groundwater data is used to evaluate the potential discharge options if dewatering during construction is required. In addition, the sample data was used to evaluate whether there are any implications in regard to the Massachusetts Contingency Plan (MCP). In order to obtain a comprehensive view of the soil and groundwater quality, the approach was to analyze the samples for a range of potential contaminants of concern.

As per the scope of work, CDM Smith collected two (2) environmental samples from each of the six (6) soil boring locations during drilling, which were analyzed for the following parameters;

- RCRA 8 Metals;
- Volatile Organic Compounds (VOCs) (8260/5053);
- Volatile Organic Compounds (VOCs) (5035 High);
- Semivolatile Organics (SVOCs) (8270D);
- Polychlorinated Biphenyls (PBCs) (8082); and
- MCP Extractable Petroleum Hydrocarbons (EPHs), Carbon-ranges only (EPH-04-1.1).

A summary of the detected analytical environmental soil data is presented in **Table 5-1,** and the laboratory reports are included in **Appendix F**. Analytical results showed detectable levels of some metals, VOCs, SVOCS and EPH carbon ranges in at least one sample collected. Three sample locations, CDM-2 (1-5'), CDM-4 (5-8'), and CDM-6 (4-8'), showed results with exceedances of the MCP reportable concentrations (RCS-1).

Groundwater samples were also collected from the two monitoring wells installed on-site during recent drilling activities, CDM-2 and CDM-3. Sampling was conducted using low flow groundwater sampling procedures. The static depth to water and depth to the well bottom were recorded prior to sampling. An adjustable rate, peristaltic pump was used to purge the wells and collect the samples. Conductivity, specific conductance, pH, temperature, dissolved oxygen (DO), and oxidation-reduction potential were measured and recorded. Samples for laboratory analyses were collected after field parameter stabilization and preserved in the field prior to delivery to the Alpha.

Groundwater samples were analyzed for the following parameters:

- RCRA 8 Dissolved Metals;
- Volatile Organic Compounds (VOCs) (8260/5053);
- Semivolatile Organics (SVOCs) (8270D/SIM);
- Polychlorinated Biphenyls (PBCs) (8082); and
- MCP Extractable Petroleum Hydrocarbons (EPHs), Carbon-ranges only (EPH-04-1.1).

There were no exceedances of the applicable MCP reportable concentration RC GW-2 standard for any of the groundwater results. Dissolved arsenic, dissolved barium, acetone, phenanthrene, and the EPH carbon range C19-C-36, Aliphatics were detected in at least one of the groundwater samples analyzed, however all detected concentrations were well below their applicable standards. A summary of the analytical groundwater data is presented in **Table 5-2** and laboratory reports are included in **Appendix F.**

5.2.1 RCRA Metals

Twelve soil samples were analyzed for the Resource Conservation and Recovery Act (RCRA) list of metals. Six metals were detected in at least one of the samples analyzed. Cadmium and selenium were not detected in any of the samples. Key constituents of concern such as arsenic and lead were detected in each of the twelve samples analyzed for RCRA 8 Metals. Concentrations of arsenic ranged from 1.8 mg/kg – 10 mg/kg, all below the RCS-1 criteria of 20 mg/kg. Concentrations of lead ranged from 3.6 mg/kg - 450 mg/kg. Lead exceeded the applicable RCS-1 criteria of 200 mg/kg in two of the samples CDM-4 (5-8') and CDM-6 (4-8') at 450 mg/kg and 340 mg/kg, respectively. All other lead samples were below the applicable standards. In addition, barium,

Table 5-1
Summary of Hits for Analytical Soil Data

CLIENT SAMPLE ID				CDM-1 1'-5'	CDM-1 5'-9'	CDM-2 1'-5'	CDM-2 5'-9'	CDM-3 1'-5'	CDM-3 5'-9'	CDM-4 1'-5'	CDM-4 5'-8'	CDM-5 1'-5'	CDM-5 5'-9'	CDM-6 1'-4'	CDM-6 4'-8'
SAMLE INTERVAL (FT-BGS)				(1 -5')	(5 - 9')	(1 -5')	(5 - 9')	(1-5')	(5-9')	(1-5')	(5-8')	(1-5')	(5-9')	(1-4')	(4-8')
SAMPLING DATE				2/25/2015	2/25/2015	2/23/2015	2/23/2015	2/26/2015	2/26/2015	2/19/2015	2/19/2015	2/17/2015	2/17/2015	2/18/2015	2/18/2015
LAB SAMPLE ID				L1503576-01	L1503576-02	L1503333-01	L1503333-02	L1503663-01	L1503663-02	L1503157-01	L1503157-02	L1502986-01	L1502986-02	L1503035-01	L1503035-02
	CAS Number	RCS-1-14	Units	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual	Qual
TCLP Parameters															
Total Lead	7439-92-1	--	mg/kg	NS	NS	NS	NS	NS	NS	NS	0.68	---	NS	NS	---
General Chemistry															
Solids, Total	---	NE	%	83.8	85	78.4	77.6	86.4	82.2	87.6	70.5	84.8	71.3	91.1	85.6
MCP Total Metals															
Arsenic, Total	7440-38-2	20	mg/kg	4.0	1.9	8.0	2.7	7.0	6.8	3.4	10	6.3	5.8	1.8	4.8
Barium, Total	7440-39-3	1,000	mg/kg	28	8.1	76	24	19	28	36	120	47	38	20	74
Chromium, Total	7440-47-3	100	mg/kg	11	8.4	9.3	7.7	12	16	20	32	18	15	24	13
Lead, Total	7439-92-1	200	mg/kg	28	3.6	81	14	38	19	79	450	100	36	4.1	340
Mercury, Total	7439-97-6	20	mg/kg	---	1.62	0.631	0.15	0.338	0.138	0.084	2.9	0.431	0.256	---	0.246
Silver, Total	7440-22-4	100	mg/kg	---	---	---	---	---	---	---	0.64	---	---	---	---
MCP Volatile Organics by 8260/5035															
Acetone	67-64-1	6	mg/kg	---	---	---	0.032	---	---	0.14	---	---	---	---	---
Methyl ethyl ketone	78-93-3	4	mg/kg	---	---	---	---	---	---	0.028	---	---	---	---	---
Naphthalene	91-20-3	4	mg/kg	---	---	---	---	---	---	---	53	---	---	---	---
MCP Semivolatile Organics															
2-Methylnaphthalene	91-57-6	0.7	mg/kg	---	---	---	---	---	---	---	34	---	---	---	---
Acenaphthene	83-32-9	4	mg/kg	---	---	---	---	---	---	---	42	---	---	---	---
Acenaphthylene	208-96-8	1	mg/kg	---	---	---	---	---	---	---	18	---	---	---	---
Anthracene	120-12-7	1,000	mg/kg	---	---	0.19	---	---	---	---	91	---	---	---	---
Benzo(a)anthracene	56-55-3	7	mg/kg	---	---	1.3	---	---	---	0.15	96	0.22	---	---	0.17
Benzo(a)pyrene	50-32-8	2	mg/kg	---	---	3.4	---	---	---	---	79	0.21	---	---	0.41
Benzo(b)fluoranthene	205-99-2	7	mg/kg	---	---	3.5	---	0.15	---	0.16	92	0.25	---	---	0.4
Benzo(ghi)perylene	191-24-2	1,000	mg/kg	---	---	4.5	---	---	---	---	34	---	---	---	0.31
Benzo(k)fluoranthene	207-08-9	70	mg/kg	---	---	1.2	---	---	---	---	34	---	---	---	0.17
Chrysene	218-01-9	70	mg/kg	---	---	1.2	---	---	---	0.14	84	0.23	---	---	0.15
Dibenzo(a,h)anthracene	53-70-3	0.7	mg/kg	---	---	0.82	---	---	---	---	9.6	---	---	---	---
Dibenzofuran	132-64-9	100	mg/kg	---	---	---	---	---	---	---	42	---	---	---	---
Fluoranthene	206-44-0	1,000	mg/kg	---	---	1.1	---	0.13	---	0.28	200	0.39	---	---	---
Fluorene	86-73-7	1,000	mg/kg	---	---	---	---	---	---	---	60	---	---	---	---
Indeno(1,2,3-cd)Pyrene	193-39-5	7	mg/kg	---	---	4.5	---	---	---	---	39	---	---	---	0.32
Naphthalene	91-20-3	4	mg/kg	---	---	---	---	---	---	---	95	---	---	---	---
Phenanthrene	85-01-8	10	mg/kg	---	---	0.67	---	---	---	0.24	290	0.29	---	---	---
Pyrene	129-00-0	1,000	mg/kg	---	---	1.1	---	0.12	---	0.27	180	0.37	---	---	0.12
MCP Polychlorinated Biphenyls															
Total PCBs	--	--	mg/kg	---	---	---	---	---	---	---	---	---	---	---	---
Extractable Petroleum Hydrocarbons															
C11-C22 Aromatics, Adjusted	C11-C22-ALPHA-J	1,000	mg/kg	---	---	40.4	28.0	---	---	28.7	2,690	148	56.6	131	---
C19-C36 Aliphatics	C19-C36-ALPHA-UJ	3,000	mg/kg	---	---	13.6	14.7	12.6	---	---	---	146	38.5	128	---
C9-C18 Aliphatics	C9-C18-ALPHA-UJ	1,000	mg/kg	---	---	---	---	---	---	---	---	22.1	13.0	---	---

Notes:
FT-BGS: Feet below ground surface
This table only presents the "hits", results with concentrations above the laboratory's reporting limits.
--- : Not detected above applicable laboratory detection limit
TCLP: Toxicity characteristic leaching procedure. TCLP analysis only performed when 20x rule exceeded.
TCLP regulated level for Total Lead is 5.0 mg/kg.
RCS-1-14: MassDEP MCP Reportable Concentration standards
Green shaded values exceede MassDEP MCP RC S-1 Standards (effective 4/25/2014)
NE: Not Established
NA: Not Analyzed

City of Cambridge
King Open School and Cambridge Street Upper Schools and Community Complex
Cambridge, Massachusetts

Table 5-2
Summary of Hits for Analytical Groundwater Data

LOCATION				CDM-2	CDM-3
SAMPLING DATE				3/19/2015	3/19/2015
LAB SAMPLE ID				L1505306-01	L1505306-02
	CasNum	RCGW-2-14	Units	Qual	Qual
MCP Dissolved Metals					
Arsenic, Dissolved	7440-38-2	0.90	mg/l	---	0.0090
Barium, Dissolved	7440-39-3	50	mg/l	0.5730	0.1080
MCP Volatile Organics (VOCs)					
Acetone	67-64-1	50	mg/l	---	0.0360
MCP Semivolatile Organics (SVOCs)					
Total SVOCs	--	--	mg/l	---	---
MCP Semivolatile Organics (SVOCs) by SIM					
Phenanthrene	85-01-8	10	mg/l	---	0.0003
MCP Polychlorinated Biphenyls (PBCs)					
Total PCBs	--	--	mg/l	---	---
Extractable Petroleum Hydrocarbons (EPH)					
C19-C36 Aliphatics	C19-C36-ALPHA-UJ	50	mg/l	---	0.5400

Notes:
RCGW-2-14: MassDEP MCP RC GW-2 standards (effective 4/25/2014)
Bold values exceede MassDEP MCP RC GW-2 Standards (effective 4/25/2014)
--- : Not detected above applicable laboratory reporting limits

chromium, mercury and silver were detected in at least one soil sample, however all were well below their respective RCS-1 criteria. It should be noted that three samples exceeded the theoretical 20X Rule for total lead and were analyzed for the Toxicity Characteristic Leaching Procedure (TCLP). The TCLP procedure determines if a waste material is considered a hazardous waste under RCRA. The three samples results for TCLP-Lead ranged from non-detect to 0.68 mg/l, which are all well below the RCRA criteria of 5 mg/l.

Two groundwater samples were collected and analyzed for RCRA 8 Metals as well. Dissolved arsenic and barium were detected in at least one sample submitted for analysis, however all concentrations were well below their applicable RCGW-2 criteria. No other metals were detected above their associated laboratory reporting limit.

5.2.2 VOCs

All twelve soil samples were analyzed for VOCs. At least one VOC was detected in three of the soil samples submitted for analysis. Acetone and methyl ethyl ketone were detected below applicable criteria. Naphthalene was detected at 53 mg/kg in sample CDM-4 (5-8'), above the applicable RCS-1 of 4 mg/kg. All other VOCs were below laboratory detection limits.

VOCs were analyzed for in the two groundwater samples as well. Acetone was detected in one sample, CDM-3, at a concentration 0.036 mg/l, well below the applicable RCGW-2 standard of 50 mg/l. All other VOCs were not detected.

5.2.3 SVOCs

All soil samples were analyzed for SVOCs. Concentrations of SVOCs were detected in six samples submitted for analysis. Two sample locations had concentrations of SVOCs above their applicable RCS-1. CDM-2 (1-5') had concentrations of benzo(a)pyrene (3.4 mg/kg) and dibenzo(a,h)anthracene (0.82 mg/kg) above their applicable RCS-1 standards of 2.0 mg/kg and 0.70 mg/kg, respectively. Eleven SVOCs were detected above applicable RCS-1 criteria in the soil sample identified as CDM-4 (5-8').

SVOCs were also analyzed for in the two groundwater samples collected. Phenanthrene was detected in one sample, well below applicable RCGW-2 standards, and all other SVOCs were below their respective laboratory detection limits.

5.2.4 PCBs

PCBs were not detected in any of the twelve soil samples or the two groundwater samples submitted for analysis.

5.2.5 EPH

All twelve soil samples were analyzed for EPH carbon ranges. Eight of the twelve samples submitted had detections of EPH carbon ranges. C_{11}-C_{22} Aromatics were detected in seven samples ranging from 28.7 mg/kg to 2,690 mg/kg. Concentrations in one of the seven samples, CDM-4 (5-8'), was detected a 2,690 mg/kg, above the RCS-1 criteria of 1,000 mg/kg, all other concentrations were below applicable standards. Detections of C_{19}-C_{36} Aliphatics ranged from 12.6 mg/kg in to 146 mg/kg, all well below the RCS-1 criteria of 3000 mg/kg. C_9-C_{18} Aliphatics were detected in two samples ranging from 13.0 mg/kg to 22.1 mg/kg, well below the RCS-1 criteria of 1,000 mg/kg.

Groundwater samples were also analyzed for EPH carbon ranges. All EPH carbon ranges were below the applicable RCGW-2 criteria. Only one carbon range was detected, C_{16}-C_{36} Aliphatics, in the samples collected from CDM-3.

5.3 Conclusions and Recommendations

Based on field observations and comparison of the soil data to the RCS-1 criteria, the property has a reportable condition under the MCP. As shown in Table 5-1, total lead, naphthalene, SVOCs and EPH were detected in concentrations in excess of their respective criteria. These levels of contamination detected on-site constitute a 120-day reportable condition under the MCP. Therefore, the City of Cambridge will be required to file a Release Notification within 120-days of gaining knowledge of the release to be in compliance with the MCP. It is anticipated that site work would need to be conducted under a Release Abatement Measure (RAM), and site closure under the requirements of the MCP.

Typically, regulated material may be reused at in-state landfills for daily cover material and structural fill for capping and contouring the final landfill cover system. However, soil associated with boring location CDM-4, exceeds in-state landfill acceptance criteria and will require recycling at an asphalt batch plant, thermal processing or out-of state landfill disposal. If soil from these locations requires off-site disposal, the material will need to be tracked under Bill of Lading (BOL) procedures to an approved waste facility. Soil from other areas of the site may be transported to a "less than RCS-1 facility" if off-site disposal is required. Acceptance packages must be prepared for each off-site receiving facility.

As the project moves forward, further site characterization is recommended to delineate the extent of site contaminants at the locations that showed elevated concentrations. In addition, some additional data may be required to satisfy the requirements of the identified receiving facilities for excess soils requiring off-site disposal. As discussed above there are three categories of material identified on-site: <RCS-1; In-State Landfill; and recycling or out of state disposal.

The following are the recommended next steps:

- Prepare a Release Notification Form (RNF) for submittal to DEP (due by approximately August 2015)
- Conduct additional site investigations to narrow down the quantities of material that require off-site disposal at In-State Landfill and out-of-state disposal.
- Prepare a Release Abatement Measure (RAM) Plan for submittal to DEP (due prior to any excavation activities)

Other submittals that will be due in the future under the MCP:

- Phase I/Tier Classification (due 1 year from RNF)
- RAM Status Reports (due 120 days from RAM Plan and 6 months thereafter until a RAM Completion is submitted)
- RAM Completion (due after all excavation and off-site disposal activities are complete)
- Permanent Solution Statement – this document closes-out the site under the MCP and will need to include a Risk Characterization (additional sampling may be required for this based on the final configuration of the site and what material has been removed from the site). Depending on the conclusions of the Risk Characterization, an Activity and Use Limitation (AUL) may be required for the property as part of the Permanent Solution.

Appendix A

Previous Test Boring Logs
M.A. Dyer Company Architects and Engineers
(January 15, 1959)

FOUNDATION PLAN
(PART "B")
Scale 1/8" = 1'-0"
MATCH LINE 'E'
MATCH LINE 'D'
MATCH LINE 'B'
DETAIL "A"
Bott. of wall El. 17.50 unless otherwise noted
SECTION A₂-A₂
Scale 3/4" = 1'-0"
SECTION B₂-B₂
Scale 3/4" = 1'-0"
SECTION C₂-C₂
Scale 3/4" = 1'-0"
TYPICAL STEP DETAIL
Scale 1½" = 1'-0"
SECTION D₂-D₂
Scale 1½" = 1'-0"
DETAIL 'A'
(A) LINE SIMILAR
Scale 3/4" = 1'-0"
PILE CAP A
2 PILE GROUP
PILE CAP B
3 PILE GROUP
PILE CAP C
4 PILE GROUP
PILE CAP DETAILS
TYPICAL PILE CAP ELEVATION
NOTE:
FOR SECTIONS A-A THRU F-F SEE DWG S-1
FOR SECTION A₁-A₁ SEE DWG S-6
FOR GEN. NOTES & TYP. DETAILS SEE DRWG. S-17
BORING LOG
BORING LOG
BORING LOCATION PLAN
KEY PLAN
Scale 1" = 100'-0"
FOUNDATION PLAN
PART 'B'
NEW DONNELLY FIELD SCHOOL
FOR THE CITY OF CAMBRIDGE, MASS.
JAN. 15, 1959
M. A. DYER COMPANY
As Noted
289-58
THOMAS MURPHY COMPANY
S-2
STRUCTURAL ENGINEERS
46 CORNHILL BOSTON, MASS.
LC
SH

Appendix B

Recent Test Boring Logs
CDM Smith (2015)

CDM Smith

Boring Number: CDM-1

Client: City of Cambridge
Project Name: King Open School
Project Location: Cambridge, MA
Project Number: 0139-107911

Drilling Contractor/Driller: New England Boring Contractors / P. Schofield
Drilling Method/Casing/Core Barrel Size: Drive and Wash / 4 in / NA
Hammer Weight/Drop Height/ Spoon Size: 140 lb / 30 in / 2 in O.D.
Bore Hole Location: See boring location plan
Drilling Date: Start: 2/25/2015 **End:** 2/26/2015

Surface Elevation (ft.): 21
Total Depth (ft.): 56
Depth to Initial Water Level (ft):

Depth	Date	Time
NR		

Abandonment Method: Backfilled with soil cuttings
Logged By: E. Wroe

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
21.0 / 0										9" concrete	
	SS	S-1	24	30 59 38 30	20	96			Fill	Wet, very dense, black to brown, fine to coarse SAND, little fine gravel, some silt and clay, trace roots (approximately 1/8" diameter)	
	SS	S-2	24	14 6 5 6	16	11			Fill	Wet, medium dense, brown to black, fine to coarse SAND, little fine to coarse gravel, little silt, trace cinders, trace roots (approximately 1 mm diameter)	
16.0 / 5	SS	S-3	24	6 5 4 7	16	9			Fill	Moist, loose, red brown to tan, fine to medium SAND, little fine gravel, little silt	
	SS	S-4	24	7 15 18 20	16	33			Fill	Moist, dense, tan, fine to medium SAND, little silt, trace fine gravel	
11.0 / 10	SS	S-5	24	12 11 11 13	14	22			Sand and Clay	Top 2": Wet, medium dense, gray, fine to coarse SAND, some fine to coarse gravel, little clayey silt Bottom 12": Moist, very stiff, tan to gray, slightly organic CLAY and SILT, trace fine sand	
	SS	S-6	24	9 12 10 11	24	22			Sand and Clay	Top 10": Wet, medium dense, gray, fine to coarse SAND and fine to coarse GRAVEL, some clayey silt Bottom 14": Wet, very stiff, gray, SILT and CLAY, trace fine sand	
	SS	S-7	24	3 4 6 6	21	10			Silty Clay	Wet, stiff, gray, CLAY and SILT, trace fine to medium sand	
6.0 / 15	SS	S-8	24	2 4 4 8	21	8			Silty Clay	Wet, stiff, gray, Silty CLAY, trace fine sand	
	SS	S-9	24	5 5 5 5	24	10			Silty Clay	Wet, stiff, gray, CLAY, trace fine sand	
1.0	SS	S-10	24	3 4	22	9			Silty Clay	Wet, stiff, gray, Silty CLAY, trace fine sand	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):			
V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):			
V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-1**

CDM Smith

Boring Number: CDM-1

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. / Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
1.0 / 20	SS	S-10	24	5 4	22	9			Silty Clay	Wet, stiff, gray, Silty CLAY, little fine sand	
	SS	S-11	24	3 5 4 3	24	9					
	SS	S-12	24	1 3 4 5	24	7				Wet, medium stiff, gray, Silty CLAY, trace fine sand	
-4.0 / 25											
-9.0 / 30	SS	S-13	24	2 2 3 4	24	5				Wet, medium stiff, gray, Silty CLAY, little fine sand	
-14.0 / 35	SS	S-14	24	2 4 3 6	24	7				Wet, medium stiff, gray, Silty CLAY, trace fine sand	
-19.0 / 40	SS	S-15	24	2 3 2 4	24	5				Wet, medium stiff, gray, Silty CLAY, trace fine sand	
-24.0 / 45	SS	S-16	24	7 4 12 15	0	16				No recovery	

Boring Number: CDM-1

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
-29.0 / 50	SS	S-17	11	64 100/5"	9	>100			Glacial Soil	Wet, very dense, gray, fine to coarse SAND and CLAY and SILT, some fine gravel	
-34.0 / 55	SS	S-18	5	50/0"	5	>50			Glacial Soil	Wet, very dense, gray, fine to coarse SAND and fine to coarse GRAVEL, some clay and silt	
										Boring terminated at 56 ft bgs.	
-39.0 / 60											
-44.0 / 65											
-49.0 / 70											

CDM Smith

Boring Number: CDM-2

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Drilling Contractor/Driller: New England Boring Contractors / G. Leavitt
Drilling Method/Casing/Core Barrel Size: Drive and Wash / 4 in / NA
Hammer Weight/Drop Height/ Spoon Size: 140 lb / 30 in / 2 in O.D.
Bore Hole Location: See boring location plan
Drilling Date: Start: 2/23/2015 **End:** 2/23/2015

Surface Elevation (ft.): 21
Total Depth (ft.): 53
Depth to Initial Water Level (ft):

Depth	Date	Time
12.1	2/23/2015	2:30 pm

Abandonment Method: Monitoring well installed
Logged By: E. Wroe

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
21.0 / 0										4" asphalt	
	SS	S-1	24	18 29 24 9	18	53	0.3		Fill	Dry, very dense, brown, fine to coarse SAND, some fine gravel, little silt	
	SS	S-2	24	6 9 13 15	13	22	0.0		Fill	Moist, medium dense, brown to black, fine to coarse SAND, little fine to coarse gravel, little clayey silt	
16.0 / 5	SS	S-3	24	9 5 7 9	12	12	0.0		Fill	Moist, medium dense, tan to black, fine to coarse SAND, some clayey silt, little fine to coarse gravel	
	SS	S-4	24	7 7 12 12	18	19	Top: 0.0 Bot: 0.0		Fill / Sand and Clay	Top 12": Moist, medium dense, dark brown, fine to coarse SAND, little clayey silt, trace fine gravel Bottom 6": Moist, medium dense, light blue-gray, fine to coarse SAND, little fine to coarse gravel, little clay and silt	
11.0 / 10	SS	S-5	24	12 20 32 42	12	52			Sand and Clay	Moist, very dense, tan-brown, Clayey SILT, trace sand	
▼	SS	S-6	24	31 32 39 35	16	71			Sand and Clay	Top 10": Wet, very dense, light brown, fine to coarse SAND, little silt Bottom 6": Wet, hard, light brown, Slightly Organic Silty CLAY	
	SS	S-7	24	40 25 20 17	24	45			Sand and Clay	Moist, hard, light brown to brown gray, Slightly Organic Silty CLAY, trace fine sand	
6.0 / 15	SS	S-8	24	4 5 8 8	24	13			Silty Clay	Wet, stiff, gray, Silty CLAY, little fine sand	
	SS	S-9	24	10 10 8 9	24	18			Silty Clay	Wet, very stiff, gray, Silty CLAY, trace fine sand	
1.0	SS	S-10	24	3 3	24	7			Silty Clay	Wet, medium stiff, gray, Silty CLAY, little fine sand	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):			
V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):			
V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

61

Reviewed by: **Date:** **Boring Number: CDM-2**

Boring Number: CDM-2

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
1.0 / 20	SS	S-10	24	4 6	24	7			Silty Clay		
	SS	S-11	24	8 8 7 8	24	15				Wet, very stiff, gray, CLAY and SILT, little fine sand	
	SS	S-12	24	3 3 3 3	24	6				Wet, medium stiff, gray, Silty CLAY, little fine sand	
-4.0 / 25											
-9.0 / 30	SS	S-13	24	WOH 1 3 4	0	4				No recovery	
-14.0 / 35	SS	S-14	24	WOR WOR WOR 4	24	0				Wet, very soft, gray, Silty CLAY, trace fine sand	
-19.0 / 40	SS	S-15	24	WOH WOH WOH 4	24	0				Wet, very soft, gray, CLAY and SILT, little fine sand	
-24.0 / 45	SS	S-16	24	16 24 23 12	24	47			Glacial Soil	Wet, dense, gray, fine to coarse SAND, some fine to coarse gravel, little clay and silt	

CDM Smith

Boring Number: CDM-2

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
-29.0 / 50	SS	S-17	6	100/2" 50/4"*	6	>100			Glacial Soil	Wet, very dense, gray, fine to coarse SAND and fine to coarse GRAVEL, little clay and silt	*Denotes 300 lb hammer
	SS	S-18	4	100/2" 50/2"*	4	>100			Glacial Soil	Wet, very dense, gray, fine to coarse GRAVEL and fine to coarse SAND, little clay and silt	
										Boring terminated at 53 feet bgs.	
-34.0 / 55											
-39.0 / 60											
-44.0 / 65											
-49.0 / 70											

Boring Number: CDM-3

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Drilling Contractor/Driller: New England Boring Contractors / P. Schofield
Drilling Method/Casing/Core Barrel Size: Drive and Wash / 4 in / NA
Hammer Weight/Drop Height/ Spoon Size: 140 lb / 30 in / 2 in O.D.
Bore Hole Location: See boring location plan
Drilling Date: Start: 2/26/2015 **End:** 2/27/2015

Surface Elevation (ft.): 21
Total Depth (ft.): 69
Depth to Initial Water Level (ft):

Depth	Date	Time
4.7	3/1/2015	3:30 pm

Abandonment Method: Monitoring well installed
Logged By: E. Wroe

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
21.0 / 0										8" concrete	
	SS	S-1	24	21, 26, 11, 7	12	37			Fill	Dry, dense, dark brown to light brown, fine to coarse SAND, and fine to coarse GRAVEL, little clayey silt	
	SS	S-2	24	3, 6, 5, 5	18	11			Fill	Moist, medium dense, dark brown to tan, fine to coarse SAND, some fine to coarse gravel, little clayey silt	
16.0 / 5	SS	S-3	24	3, 6, 6, 11	13	12			Fill	Top 10": Moist, medium dense, gray-brown, fine to coarse SAND, some fine gravel, some clayey silt Bottom 3": Moist, medium dense, dark brown, fine to coarse SAND, some fine to coarse gravel, little clayey silt	
	SS	S-4	24	10, 14, 10, 12	18	24			Fill / Silty Clay	Top 9": Moist, medium dense, light brown, fine to coarse SAND, little fine gravel, trace clayey silt Bottom 9": Moist, hard, light gray-brown, Clayey SILT and fine SAND	
11.0 / 10	SS	S-5	24	5, 9, 12, 10	20	21			Silty Clay	Wet, very stiff, gray, CLAY and SILT, trace fine sand	
	SS	S-6	24	9, 9, 8, 8	24	17	0.0		Silty Clay	Wet, very stiff, gray, Silty CLAY, little fine to coarse gravel, little fine sand	
	SS	S-7	24	6, 9, 8, 7	18	17	0.0		Silty Clay	Wet, very stiff, gray, Silty CLAY, trace fine gravel, trace fine sand	
6.0 / 15	SS	S-8	24	2, 5, 10, 8	24	15	0.0		Silty Clay	Wet, very stiff, gray, SIlty CLAY, trace fine sand	
	SS	S-9	24	5, 5, 4, 5	24	9			Silty Clay	Wet, very stiff, gray, Silty CLAY, trace fine sand	
1.0	SS	S-10	24	1, 3	24	7			Silty Clay	Wet, medium stiff, gray, Silty CLAY, trace fine sand	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):			
V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):			
V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-3**

BL KING OPEN SCHOOL.GPJ - 4/10/15

Boring Number: CDM-3

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. / Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
1.0 / 20	SS	S-10	24	4 4	24	7			Silty Clay		
	SS	S-11	24	3 5 4 4	24	9				Wet, stiff, gray, Silty CLAY, trace fine sand	
	SS	S-12	24	2 2 3 4	24	5				Wet, medium stiff, gray, Silty CLAY, trace fine sand	
-4.0 / 25											
-9.0 / 30	SS	S-13	24	2 2 2 3	24	4				Wet, medium stiff, gray, Silty CLAY, trace fine sand	
-14.0 / 35	SS	S-14	24	WOR 2 2 3	24	4				Wet, medium stiff, gray, CLAY, trace fine sand	
-19.0 / 40	SS	S-15	24	WOR WOH WOH 3	24	0				Wet, very soft, gray, Silty CLAY, trace fine sand	
-24.0 / 45	SS	S-16	24	WOR WOR 1 3	24	1				Wet, very soft, gray, Silty CLAY, trace fine sand	

Boring Number: CDM-3

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
-29.0 / 50	SS	S-17	24	WOR WOR 2 3	24	2			Silty Clay	Wet, very soft, gray, Silty CLAY, trace fine sand	
-34.0 / 55	SS	S-18	24	WOR WOR 1 3	24	1	0.0		Silty Clay	Wet, very soft, gray, Silty CLAY, trace fine sand	
-39.0 / 60	SS	S-19	24	5 8 10 11	10	18	0.0		Glacial Soil	Wet, medium dense, gray, fine to coarse SAND, some clay and silt, some fine gravel	
-44.0 / 65	SS	S-20	24	14 60 70 98	9	130			Glacial Soil	Wet, very dense, gray, fine to coarse GRAVEL and fine to coarse SAND, some clay and silt	
	SS	S-21	15	10 37 100/3"	0	>137			Glacial Soil	No recovery	
										Boring terminated at 69 ft bgs.	
-49.0 / 70											

CDM Smith

Boring Number: CDM-4

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Drilling Contractor/Driller: New England Boring Contractors / G. Leavitt
Drilling Method/Casing/Core Barrel Size: Drive and Wash / 4 in / NA
Hammer Weight/Drop Height/ Spoon Size: 140 lb / 30 in / 2 in O.D.
Bore Hole Location: See boring location plan
Drilling Date: Start: 2/19/2015 **End:** 2/20/2015

Surface Elevation (ft.): 21
Total Depth (ft.): 68
Depth to Initial Water Level (ft):

Depth	Date	Time
17.5	2/20/2015	1:30 pm

Abandonment Method: Backfilled with soil cuttings
Logged By: E. Wroe

Elev. / Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
21.0 / 0										6" asphalt	
	SS	S-1	24	47 42 11 11	10	53			Fill	Dry, very dense, brown, fine to coarse SAND, some fine to coarse gravel, little silt	
	SS	S-2	24	11 18 13 16	12	31			Fill	Dry, dense, gray to brown, fine to coarse SAND, some silty clay, little fine gravel	
16.0 / 5	SS	S-3	24	14 9 9 8	14	18			Fill	Moist, very dense, black, fine to coarse SAND, some fine to coarse gravel, little clayey silt	
	SS	S-4	24	6 8 11 11	13	19			Fill / Sand and Clay	Top 5": Moist, medium dense, black, fine to coarse SAND, some silt, little fine to coarse gravel Bottom 8": Moist, medium dense, blue-gray, mottled brown, Clayey SILT and fine SAND, trace fine gravel	
11.0 / 10	SS	S-5	24	4 10 10 14	17	20			Sand and Clay	Top 4": Wet, very stiff, gray, Silty CLAY, some fine to medium sand, little fine gravel Bottom 13": Moist, medium dense, gray, Slightly Organic CLAY and SILT, fine to medium SAND, trace fine gravel	
	SS	S-6	24	6 12 8 9	24	20			Sand and Clay	Wet, medium dense, gray, fine to medium SAND, little clay and silt	
	SS	S-7	24	4 5 9 11	0	14			Sand and Clay	No recovery	
6.0 / 15	SS	S-8	24	3 4 6 15	0	10			Silty Clay	No recovery	
▼	SS	S-9	24	4 5 4 3	24	9			Silty Clay	Wet, stiff, brown-gray, Silty CLAY, trace fine sand	
1.0	SS	S-10	24	1 2	24	5			Silty Clay	Wet, medium stiff, gray, Silty CLAY, trace fine sand	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):

V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):

V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-4**

CDM Smith

Boring Number: CDM-4

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. / Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
1.0 / 20	SS	S-10	24	3 4	24	5			Silty Clay		
	SS	S-11	24	4 6 5 5	20	11				Wet, stiff, gray, Silty CLAY, trace fine sand	
	SS	S-12	24	1 2 3 4	21	5				Wet, medium stiff, gray, Silty CLAY, trace fine sand	
-4.0 / 25	SS	S-13	24	3 5 4 4	24	9				Wet, stiff, gray, Silty CLAY, trace fine sand	
	ST	U-1	24	PUSH	24	PUSH				Wet, gray, Silty CLAY, trace fine sand	Torvane: 0.55-0.75 tsf Pocket Penetrometer: 1.0-1.25 tsf
-9.0 / 30	SS	S-14	24	1 2 3 5	24	5				Wet, medium stiff, gray, Silty CLAY, trace fine sand	
-14.0 / 35	SS	S-15	24	WOH WOH WOH 5	24	0				Wet, very stiff, gray, Silty CLAY, trace fine sand	
-19.0 / 40	SS	S-16	24	WOR WOR WOR 3	24	0				Wet, very soft, gray, Silty CLAY, trace fine sand	
-24.0 / 45	SS	S-17	24	WOR WOR WOH 3	24	0				Wet, very soft, gray, Silty CLAY, trace fine sand	
	ST	U-2	24	PUSH	24	PUSH				Wet, gray, Silty CLAY, trace fine sand	

CDM Smith

Boring Number: CDM-4

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
	ST	U-2	24		24	PUSH			Silty Clay		Torvane: 0.35 tsf Pocket Penetrometer: 0.5 tsf
	SS	S-18	24	WOR WOR WOH 5	24	0			Silty Clay	Wet, very soft, gray, Silty CLAY, trace fine sand	
-29.0 / 50									Silty Clay		
-34.0 / 55	SS	S-19	24	WOR WOR WOR 6	24	0			Silty Clay	Wet, very soft, gray, CLAY, trace fine sand	
-39.0 / 60	SS	S-20	24	11 13 18 26	6	31			Glacial Soil	Wet, hard, gray, CLAY and SILT, some fine to coarse sand, little fine gravel	
-44.0 / 65	SS	S-21	24	22 25 45 62	4	70			Glacial Soil	Wet, very dense, black mottled brown, fine to coarse SAND and fine to coarse GRAVEL, little silt	
	SS	S-22	24	25 52 78 93	20	130			Glacial Soil	Top 6": Wet, very dense, gray, fine to coarse GRAVEL and fine to coarse SAND, little clay and silt Bottom 14": Wet, hard, gray, CLAY and SILT and fine SAND, trace fine gravel	
										Boring terminated at 68 feet bgs.	
-49.0 / 70											

Boring Number: CDM-5

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Drilling Contractor/Driller: New England Boring Contractors / G. Leavitt
Drilling Method/Casing/Core Barrel Size: Drive and Wash / 4 in / NA
Hammer Weight/Drop Height/ Spoon Size: 140 lb / 30 in / 2 in O.D.
Bore Hole Location: See boring location plan
Drilling Date: Start: 2/17/2015 **End:** 2/17/2015

Surface Elevation (ft.): 21
Total Depth (ft.): 71
Depth to Initial Water Level (ft):

Depth	Date	Time
7	2/17/2015	9:30 am

Abandonment Method: Backfilled with soil cuttings
Logged By: E. Wroe

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
21.0 / 0										6" asphalt	
	SS	S-1	24	36 15 9 16	18	24			Fill	Moist, medium dense, dark brown to black, fine to coarse SAND and fine to coarse GRAVEL, little silt	
	SS	S-2	24	15 21 18 14	2	39			Fill	Moist, dense, dark brown to black, fine to coarse SAND and fine to coarse GRAVEL, little silt	
16.0 / 5	SS	S-3	24	13 28 23 14	2	51			Fill	Wet, brick fragments approximately 1" to 1.5" in diameter	
▼	SS	S-4	24	5 5 6 8	0	11			Fill	No recovery	
11.0 / 10	SS	S-5	24	12 11 5 7	12	16			Sand and Clay	Wet, very stiff, blue-gray, Slightly Organic Silty CLAY, trace fine silt, trace sand, trace wood/plant fibers	
	SS	S-6	24	10 20 27 27	24	47			Sand and Clay	Top 14": Wet, gray, hard, CLAY, trace fine sand Bottom 10": Wet, very dense, dark gray, fine to coarse SAND, trace silt	
	SS	S-7	24	7 6 8 13	11	14			Sand and Clay	Top 6": Wet, very stiff, gray, CLAY and fine GRAVEL, some fine to medium sand Bottom 5": Wet, very stiff, gray, Slightly Organic CLAY and SILT, trace fine sand	
6.0 / 15	SS	S-8	24	7 9 13 14	0	22			Silty Clay	No recovery	
	SS	S-9	24	9 12 10 11	24	22			Silty Clay	Wet, very stiff, gray, Silty CLAY, trace fine sand	
1.0	ST	U-1	24	PUSH	24	PUSH			Silty Clay	Wet, gray, Silty CLAY, trace fine to medium sand	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):			
V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):			
V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-5**

CDM Smith

Boring Number: CDM-5

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. / Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
1.0 / 20	ST	U-1	24		24	PUSH			Silty Clay	Wet, medium stiff, gray, Silty CLAY, trace fine sand	Torvane: 0.35-0.375 tsf Pocket Penetrometer: 0.5 tsf
	SS	S-10	24	2 2 4 5	24	6					
-4.0 / 25	SS	S-11	24	1 3 3 4	24	6				Wet, medium stiff, gray, Silty CLAY, trace fine sand	
-9.0 / 30	SS	S-12	24	1 2 2 2	24	4				Wet, soft, gray, Silty CLAY, trace fine sand	
-14.0 / 35	SS	S-13	24	WOH WOH WOH WOH	12	0				Wet, very soft, gray, Silty CLAY, trace fine sand	
-19.0 / 40	SS	S-14	24	WOH WOH WOH WOH	24	0				Wet, very soft, gray, Silty CLAY, trace fine sand	
-24.0 / 45	SS	S-15	24	WOR WOR WOR WOH	24	0				Wet, very soft, gray, Silty CLAY, trace fine sand	

CDM Smith

Boring Number: CDM-5

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
-29.0 / 50	SS	S-16	24	WOR WOR WOR WOR	24	0			Silty Clay	Wet, very soft, gray, Silty CLAY, trace fine sand	
-34.0 / 55	SS	S-17	24	WOR WOR WOR WOR	24	0			Silty Clay	Wet, very soft, gray, CLAY and SILT, trace fine to coarse sand	
-39.0 / 60	SS	S-18	24	WOR WOR 11 22	24	11			Silty Clay / Glacial Soil	Top 22": Wet, very soft, gray, CLAY and SILT, trace fine sand Bottom 2": Wet, medium dense, gray, fine to coarse GRAVEL and CLAY, little fine to medium sand	
-44.0 / 65	SS	S-19	24	28 26 47 66	9	73			Glacial Soil	Wet, very dense, gray, fine to coarse SAND and CLAY and SILT, some fine gravel	
-49.0 / 70	SS	S-20	24	23 32 41 61	18	73			Glacial Soil	Top 6": Wet, very dense, gray, CLAY and fine GRAVEL, little fine to coarse sand Bottom 12": Wet, hard, gray, CLAY and SILT, trace fine sand	
										Boring terminated at 71 feet bgs.	

CDM Smith

Boring Number: CDM-6

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Drilling Contractor/Driller: New England Boring Contractors / G. Leavitt
Drilling Method/Casing/Core Barrel Size: Drive and Wash / 4 in / NA
Hammer Weight/Drop Height/ Spoon Size: 140 lb / 30 in / 2 in O.D.
Bore Hole Location: See boring location plan
Drilling Date: Start: 2/18/2015 **End:** 2/19/2015

Surface Elevation (ft.): 21
Total Depth (ft.): 58.5
Depth to Initial Water Level (ft):

Depth	Date	Time
NR		

Abandonment Method: Backfilled with soil cuttings
Logged By: E. Wroe

Elev. Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
21.0 / 0										6" asphalt	
	SS	S-1	3	50/3"	2.5		0.4		Fill	Dry, very dense, brown, fine to coarse SAND and fine to coarse GRAVEL, trace silt	
	SS	S-2	24	89 16 11 10	12	27	0.4		Fill	Moist, medium dense, brown, fine to coarse SAND, some fine to coarse gravel, little silt and clay	
16.0 / 5	SS	S-3	24	10 8 5 7	7	13	0.2		Fill	Moist, medium dense, brown to light brown, fine to coarse GRAVEL, some silt and clay, trace brick fragments	
	SS	S-4	24	20 27 14 19	12	41			Fill / Sand and Clay	Top 10": Wet, brown to red to black, fine to coarse GRAVEL and fine to coarse SAND, little silt, trace brick fragments Bottom 2": Wet, black to gray Silty CLAY, little fine to medium sand, trace fine gravel	
	SS	S-5	24	11 12 16 11	18	28			Sand and Clay	Wet, medium dense, gray, Slightly Organic Clayey Silt and fine to medium SAND, trace fine gravel	
11.0 / 10	SS	S-6	24	5 4 5 6	23	9			Sand and Clay / Silty Clay	Top 7.5": Wet, loose, gray, fine to coarse SAND, some slightly organic silt and clay, trace fine gravel Bottom 15.5": Wet, stiff, gray, CLAY and SILT, trace fine to medium sand	
	SS	S-7	24	5 7 8 11	17	15			Silty Clay	Wet, stiff, gray, CLAY, trace fine to medium sand	
6.0 / 15	SS	S-8	24	2 3 4 5	24	7			Silty Clay	Wet, medium stiff, gray, Silty CLAY, trace fine sand	
	SS	S-9	24	5 6 7 6	24	13			Silty Clay	Wet, stiff, blue gray to brown gray, Silty CLAY, trace fine sand	
1.0	SS	S-10	24	5 6 5 6	24	11			Silty Clay	Wet, stiff, brown gray, Silty CLAY, trace fine sand	

Sample Types

AS - Auger/Grab Sample
CS - California Sampler
BQ - 1.5" Rock Core
NQ - 2" Rock Core
HP - Hydro Punch
SS - Split Spoon
ST - Shelby Tube
WS - Wash Sample
GP - Geoprobe

Consistency vs Blowcount/Foot

Granular (Sand):			
V. Loose:	0-4	Dense:	30-50
Loose:	4-10	V. Dense:	>50
M. Dense:	10-30		

Fine Grained (Clay):			
V. Soft:	<2	Stiff:	8-15
Soft:	2-4	V. Stiff:	15-30
M. Stiff:	4-8	Hard:	>30

Burmister Classification

and	35-50%
some	20-35%
little	10-20%
trace	<10%

moisture, density, color

Reviewed by: **Date:** **Boring Number: CDM-6**

Boring Number: CDM-6

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. / Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
1.0 / 20	SS	S-11	24	1 2 3 5	24	5			Silty Clay	Wet, medium stiff, gray, Silty CLAY, trace fine sand	
	SS	S-12	24	4 7 6 6	24	13			Silty Clay	Wet, stiff, gray, Silty CLAY, trace fine sand	
-4.0 / 25	SS	S-13	24	3 3 6 5	19	9			Silty Clay	Wet, stiff, gray, Silty CLAY, trace fine sand	
-9.0 / 30	SS	S-14	24	1 2 2 4	0	4			Silty Clay	No recovery	
-14.0 / 35	SS	S-15	24	1 2 3 4	24	5			Silty Clay	Wet, medium stiff, gray, CLAY and SILT, trace fine sand	
	ST	U-1	24	PUSH	24	PUSH			Silty Clay		Torvane: 0.2-0.3 tsf Pocket Penetrometer: 0.25-0.5 tsf
-19.0 / 40	SS	S-16	24	2 2 4 6	24	6			Silty Clay	Wet, medium stiff, gray, CLAY and SILT, trace fine sand	
-24.0 / 45	SS	S-17	24	5 11 20 30	19	31			Glacial Soil	Wet, dense, gray, fine to coarse GRAVEL and CLAY and SILT, little fine to coarse sand	

CDM Smith

Boring Number: CDM-6

Client: City of Cambridge
Project Location: Cambridge, MA
Project Name: King Open School
Project Number: 0139-107911

Elev. / Depth (ft)	Sample Type	Sample Number	Sample Length (in)	Blows per 6 inches	Sample Recovery (in)	N-Value	Organic Vapor Reading (ppm)	Graphic Log	Strata	Material Description	Remarks
									Glacial Soil		Rig chatter from 47'-48'
-29.0 / 50	SS	S-18	24	33 32 34 35	9	66				Wet, very dense, gray mottled brown, fine to coarse GRAVEL and fine to coarse SAND, little clayey silt	
-34.0 / 55	SS	S-20	24	28 29 45 60	0	74				No recovery	
	SS	S-21	24	14 26 41 49	12	67				Wet, hard, gray, Silty CLAY, trace fine sand	
										Boring terminated at 58.5 feet bgs.	
-39.0 / 60											
-44.0 / 65											
-49.0 / 70											

Appendix C

Monitoring Well Logs

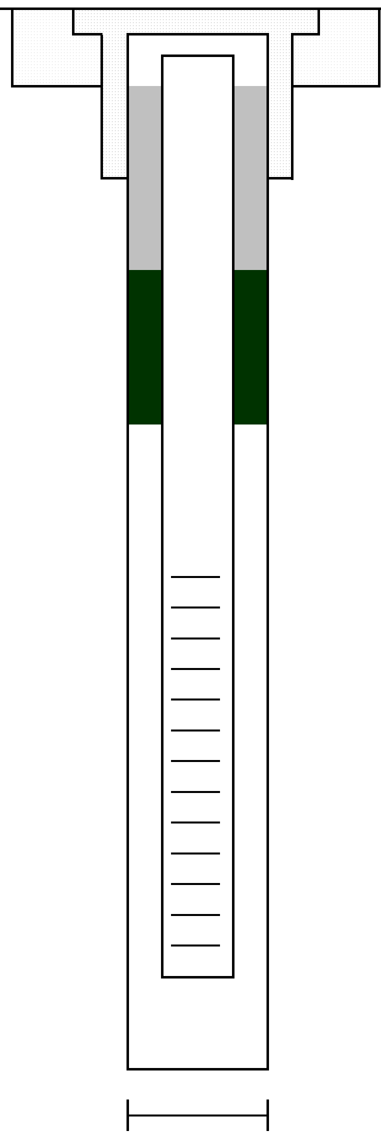
75 State Street
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	City of Cambridge	Contractor:	New England Boring Contractors	Boring/Well No.:	CDM-2 (MW)
Project Name:	King Open School	Driller:	G. Leavitt	Date Installed:	2/23/2015
Project Location:	Cambridge, MA	Ground EL:	21	Logged By:	E. Wroe
Project Number:	0139-107911	Riser EL:	20.7	Page:	1 of 2

GROUND SURFACE

ROADWAY BOX



SURFACE SEAL: (Thickness & Type) 1 ft concrete

BACKFILL MATERIAL: (Type) soil cuttings

TOP OF SEAL: 1 ft bgs

SEAL CONSTRUCTION: (Thickness & Type) bentonite chips

TOP OF SANDPACK: 2 ft bgs

RISER CONSTRUCTION: (Type, Diameter Material) 2 in diameter PVC

TOP OF SCREEN: 5 ft bgs

SANDPACK TYPE: 1S

SCREEN MATERIAL: (Type, Slot, Diameter Material) 2 in diameter PVC

BOTTOM OF SCREEN: 20 ft bgs

BOTTOM OF SAND: 21 ft bgs

BOTTOM OF BOREHOLE: 65 ft bgs

BOREHOLE DIAMETER: 4 in

NOTE: All depths are in feet below ground surface, unless noted otherwise.

Remarks: Native material backfilled to the bottom of the sand

Updated On: 04/09/01

75 State Street
Suite 701
Boston, MA 02109
(617)-452-6000

Monitoring Well Report

Client:	City of Cambridge		
Project Name:	King Open School	Ground Surface El	21
Project Location:	Cambridge, MA	Riser EL:	20.7
Project Number:	0139-107911		

Boring/Well No. CDM-2

Date	Time	Elapsed Time (days)	Depth of Water From Top of Riser (ft)	Elevation of Water (ft)	Remarks	Read By
2/23/2015	2:30 PM	0	12.1	8.6		E. Wroe
2/24/2015	2:30 PM	1	6.2	14.5		E. Wroe
3/11/2015	6:00 AM	16	3.6	17.1		E. Wroe
3/13/2015	6:45 AM	18	5.1	15.6		E. Wroe

Remarks:

Updated On: 04/09/01

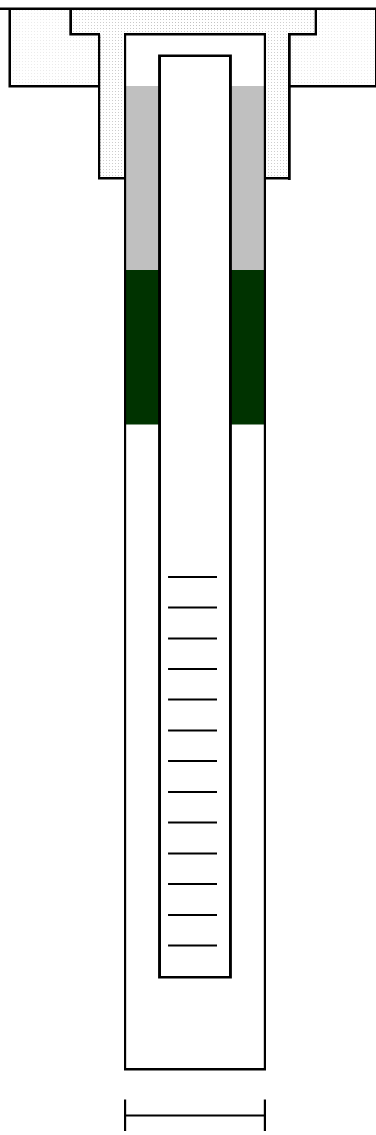
75 State Street
Suite 701
Boston, MA 02109
(617) 452-6000

Monitoring Well Installation Log

Client:	City of Cambridge	Contractor:	New England Boring Contractors	Boring/Well No.:	CDM-3 (MW)
Project Name:	King Open School	Driller:	P. Schofield	Date Installed:	2/27/2015
Project Location:	Cambridge, MA	Ground EL:	21	Logged By:	E. Wroe
Project Number:	0139-107911	Riser EL:	20.8	Page:	1 of 2

GROUND SURFACE

ROADWAY BOX



4 in

SURFACE SEAL: 1 ft concrete
(Thickness & Type)

BACKFILL MATERIAL: 1S sand
(Type)

TOP OF SEAL: 3 ft bgs

SEAL CONSTRUCTION: 1 ft bentonite chips
(Thickness & Type)

TOP OF SANDPACK: 4 ft bgs

RISER CONSTRUCTION: 2 in diameter PVC
(Type, Diameter Material)

TOP OF SCREEN: 5 ft bgs

SANDPACK TYPE: 1S

SCREEN MATERIAL: 2 in diameter PVC
(Type, Slot, Diameter Material)

BOTTOM OF SCREEN: 20 ft bgs

BOTTOM OF SAND: 21 ft bgs

BOTTOM OF BOREHOLE: 69 ft bgs

BOREHOLE DIAMETER: 4 in

NOTE: All depths are in feet below ground surface, unless noted otherwise.

Remarks: Native material backfilled to the bottom of the sand

Updated On: 04/09/01

75 State Street
Suite 701
Boston, MA 02109
(617)-452-6000

Monitoring Well Report

Client:	City of Cambridge				
Project Name:	King Open School	Ground Surface EL:	21	Boring/Well No.	CDM-3
Project Location:	Cambridge, MA	Riser EL:	20.8	Page:	2 of 2
Project Number:	0139-107911				

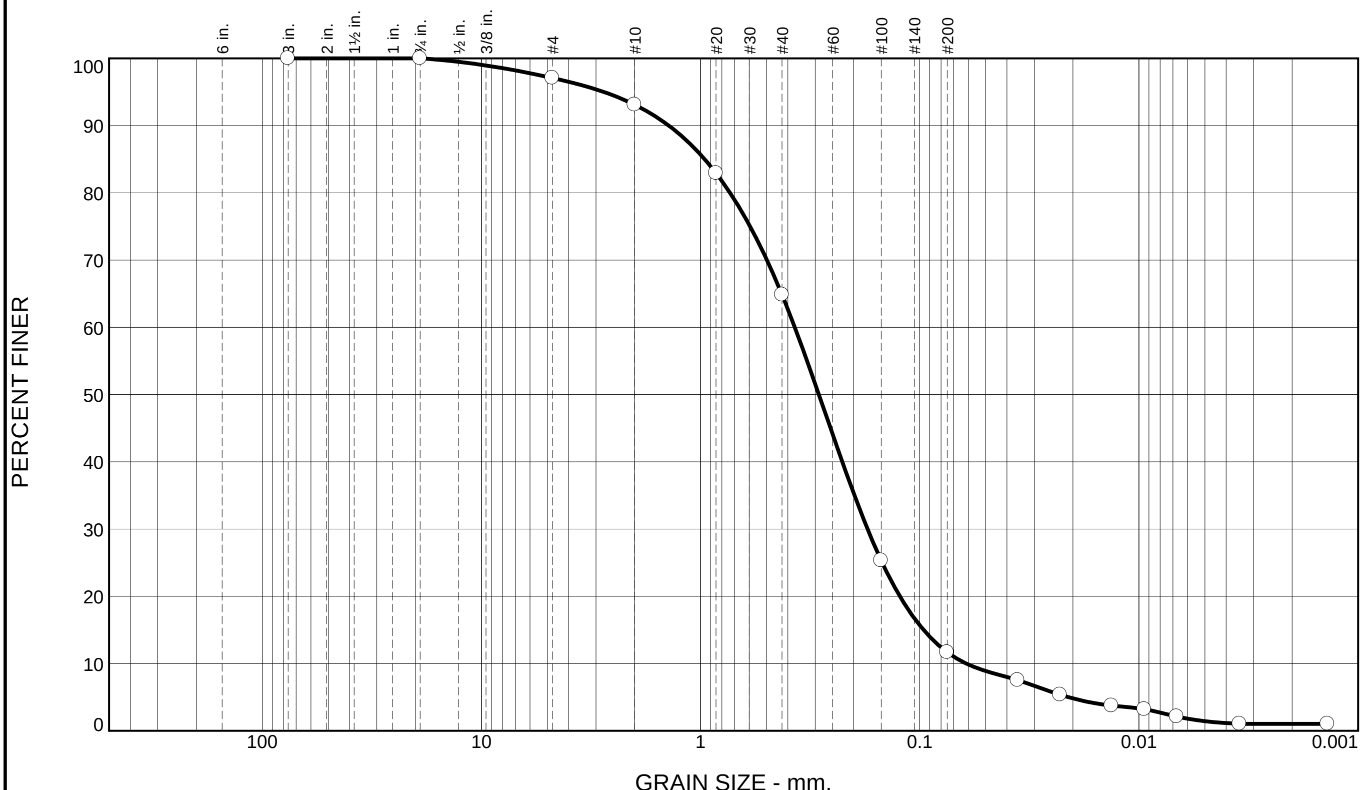
Date	Time	Elapsed Time (days)	Depth of Water From Top of Riser (ft)	Elevation of Water (ft)	Remarks	Read By
2/27/2015	3:00 PM	0	0	20.8		E. Wroe
3/1/2015	3:30 PM	2	4.7	16.1		E. Wroe
3/11/2015	6:30 AM	12	5.1	15.7		E. Wroe
3/13/2015	8:18 AM	14	6	14.8		E. Wroe

Remarks:

Appendix D

Laboratory Test Results

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.9	4.0	28.3	53.1	10.3	1.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	97.1		
#10	93.1		
#20	82.9		
#40	64.8		
#100	25.3		
#200	11.7		

* (no specification provided)

Material Description

Well-graded sand with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.3976 D_{85}= 0.9583 D_{60}= 0.3718
D_{50}= 0.2887 D_{30}= 0.1731 D_{15}= 0.0961
D_{10}= 0.0614 C_u= 6.06 C_c= 1.31

Classification

USCS= SW-SM AASHTO=

Remarks

As received moisture content=17.5%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-1 **Depth:** 7-9
Sample Number: S-4

Date: 2/25/15

CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

CDM Smith

Geotechnical Engineering Laboratory

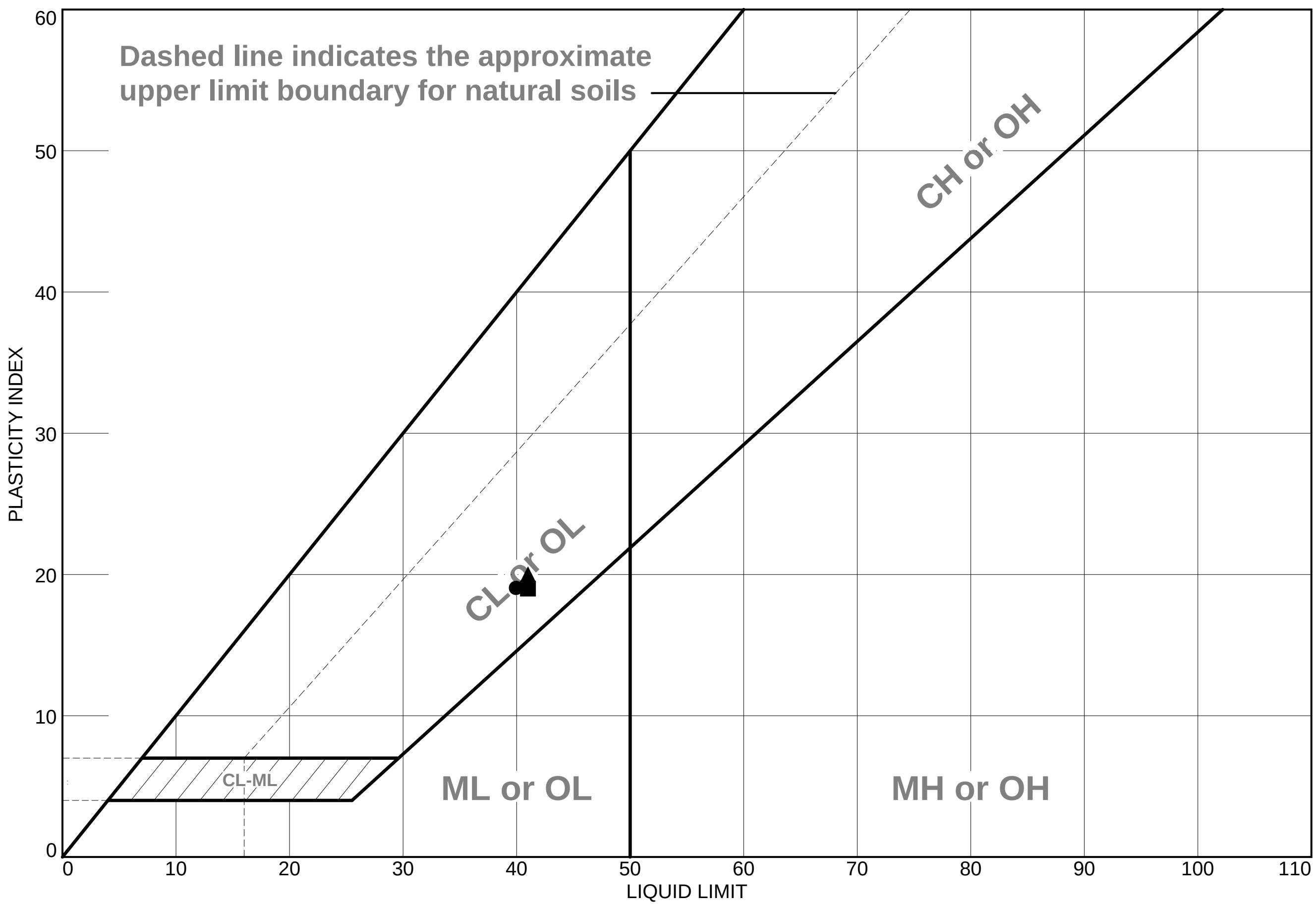
Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils(ASTM D2974)

Client:	City of Cambridge		
Project Name:	King Open School	Tested By:	JB
Project Location:	Cambridge, MA	Test Date:	3/12/2015
Project Number:	0139-107911		
Sample Number:	S-5B	Procedure:	C
Sample Location:	CDM-1	Temperature:	440 ^{0}C
Sample Depth (ft):	9-11		
Sample Date:	2/25/2015		
Lab ID Number:	453074319		

AS RECEIVED MOISTURE CONTENT	
Tin Mass (g)	1.40
Wet Mass of Sample & Tin (g)	9.25
Dry Mass of Sample & Tin (g)	7.66
Mass of Water (g)	1.6
Mass of Dry Soil (g)	6.3
Moisture Content (%)	25.4

ASH CONTENT	
Porcelain Dish Mass (g)	18.6
Porcelain Dish + Oven Dried Soil (g)	24.9
Mass of Oven Dried Soil (g)	6.3
Mass of Dish & Burned Soil (g)	24.8
Mass of Burned Soil (g)	6.1
Mass of Organic Material (g)	0.1
Ash Content (%)	98.1
Organic Content (%)	1.9

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean clay	40	21	19			CL
■	Lean clay	41	22	19			CL
▲	Lean clay	41	21	20			CL

Project No. 0139-107911 **Client:** City of Cambridge

Project: King Open School and Cambridge Street Upper Schools and Community Complex

●**Source of Sample:** CDM-1 **Depth:** 9-11 **Sample Number:** S-5B
■**Source of Sample:** CDM-1 **Depth:** 13-15 **Sample Number:** S-7
▲**Source of Sample:** CDM-1 **Depth:** 30-32 **Sample Number:** S-13

Remarks:
●As received moisture content=25.4
■As received moisture content=32.6%
▲As received moisture content=44.8%

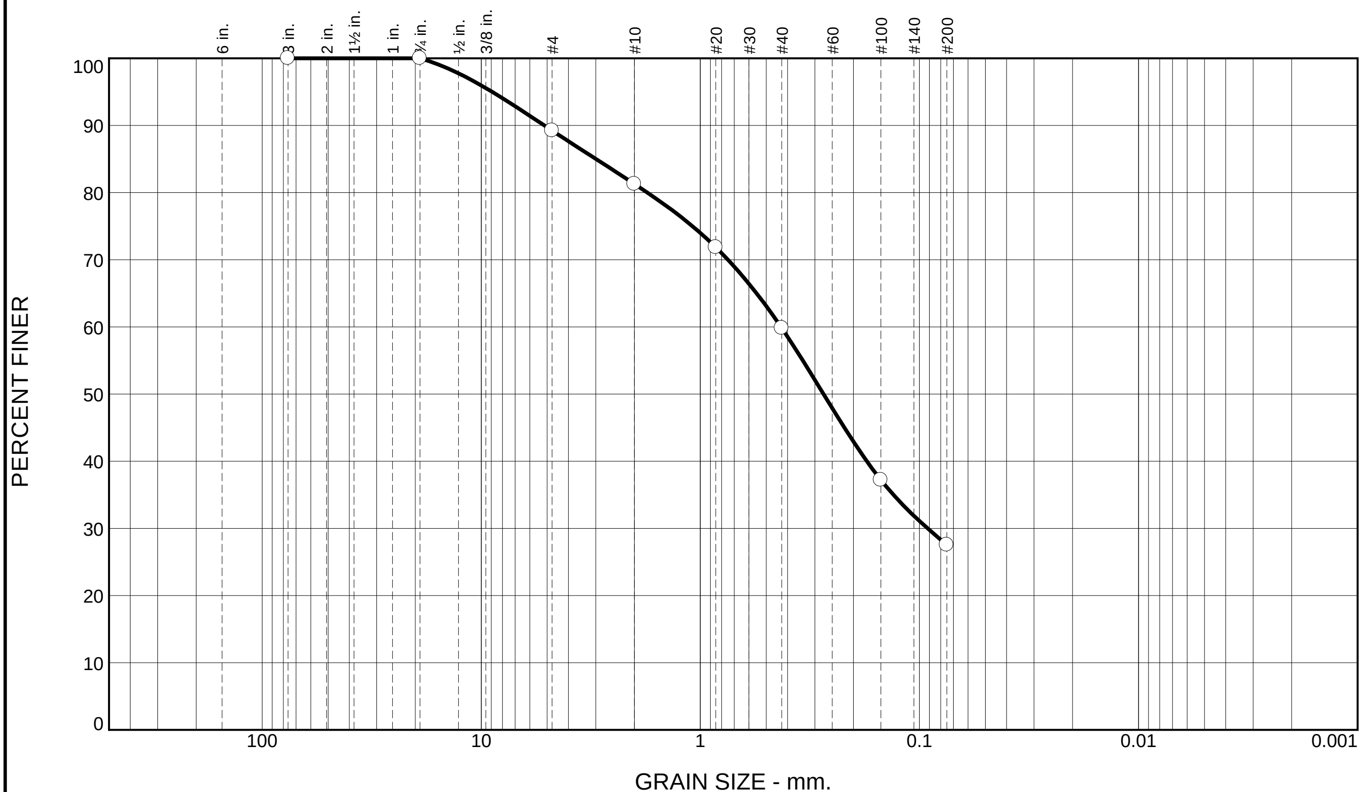
CDM Smith

Cambridge, Massachusetts

Figure

Tested By: JC **Checked By:** BFM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	10.8	7.9	21.5	32.3	27.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	89.2		
#10	81.3		
#20	71.8		
#40	59.8		
#100	37.2		
#200	27.5		

* (no specification provided)

Material Description

Silty sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 5.1561 D_{85}= 2.9955 D_{60}= 0.4284
D_{50}= 0.2740 D_{30}= 0.0917 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

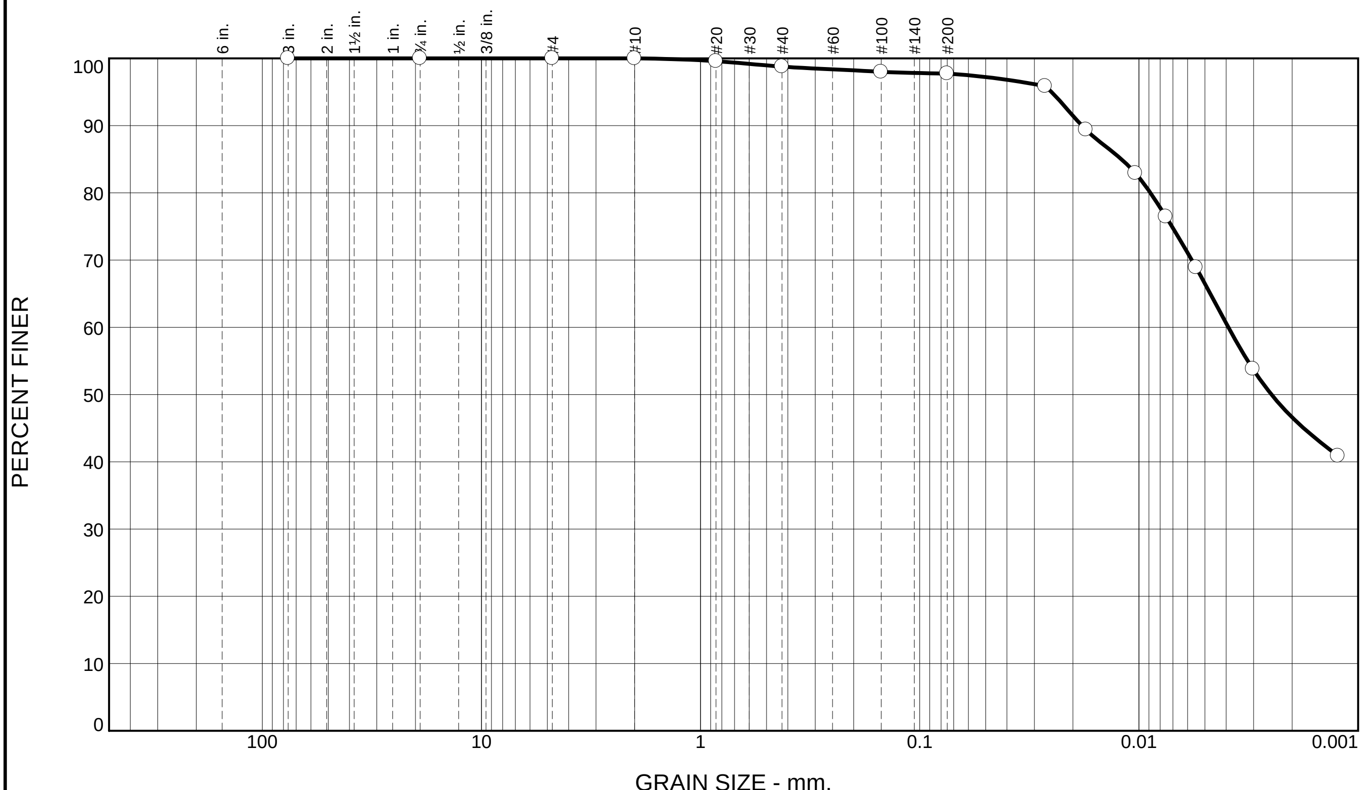
As received moisture content=25.5%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-2 **Depth:** 1-3
Sample Number: S-1 **Date:** 2/23/15

CDM Smith Cambridge, Massachusetts	**Client:** City of Cambridge **Project:** King Open School and Cambridge Street Upper Schools and Community Complex **Project No:** 0139-107911 **Figure**

Tested By: KB **Checked By:** JC

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	1.2	1.1	31.2	66.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	100.0		
#10	100.0		
#20	99.6		
#40	98.8		
#100	98.0		
#200	97.7		

* (no specification provided)

Material Description

Lean clay

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.0182 D_{85}= 0.0120 D_{60}= 0.0039
D_{50}= 0.0025 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

As received moisture content=24.5%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-2 **Depth:** 9-11
Sample Number: S-5

Date: 2/23/15

CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

CDM Smith

Geotechnical Engineering Laboratory

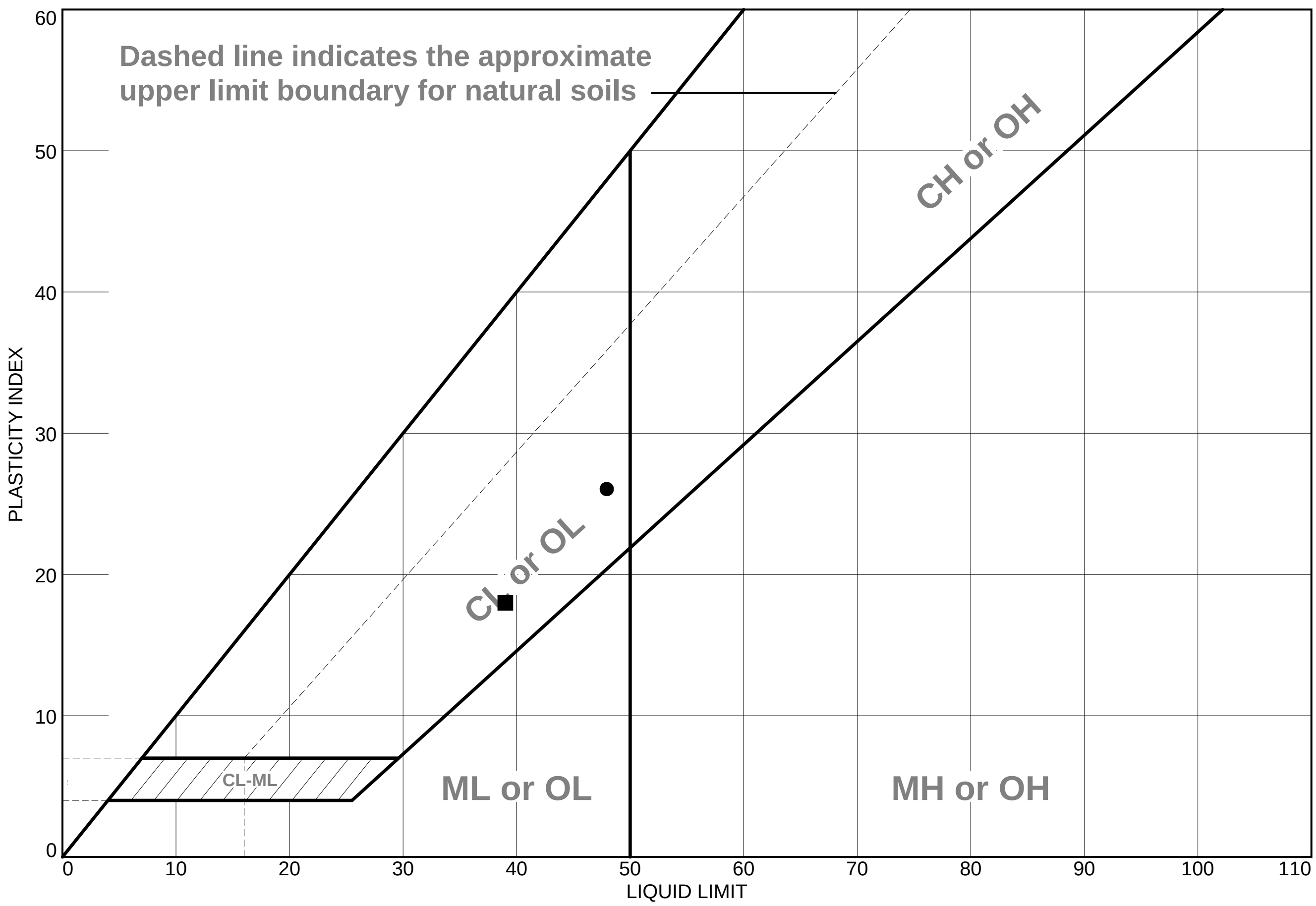
Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils(ASTM D2974)

Client:	City of Cambridge		
Project Name:	King Open School	Tested By:	JB
Project Location:	Cambridge, MA	Test Date:	3/12/2015
Project Number:	0139-107911		
Sample Number:	S-7	Procedure:	C
Sample Location:	CDM-2	Temperature:	440 ^{0}C
Sample Depth (ft):	13-15		
Sample Date:	2/23/2015		
Lab ID Number:	453074324		

AS RECEIVED MOISTURE CONTENT	
Tin Mass (g)	1.40
Wet Mass of Sample & Tin (g)	7.81
Dry Mass of Sample & Tin (g)	6.26
Mass of Water (g)	1.6
Mass of Dry Soil (g)	4.9
Moisture Content (%)	31.9

ASH CONTENT	
Porcelain Dish Mass (g)	18.1
Porcelain Dish + Oven Dried Soil (g)	23.0
Mass of Oven Dried Soil (g)	4.9
Mass of Dish & Burned Soil (g)	22.9
Mass of Burned Soil (g)	4.8
Mass of Organic Material (g)	0.1
Ash Content (%)	98.2
Organic Content (%)	1.8

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean clay	48	22	26			CL
■		39	21	18			CL

Project No. 0139-107911 **Client:** City of Cambridge

Project: King Open School and Cambridge Street Upper Schools and Community Complex

●**Source of Sample:** CDM-2 **Depth:** 13-15 **Sample Number:** S-7

■**Source of Sample:** CDM-2 **Depth:** 39-41 **Sample Number:** S-15

Remarks:

●As received moisture content=31.9%

■As received moisture content=30.5%

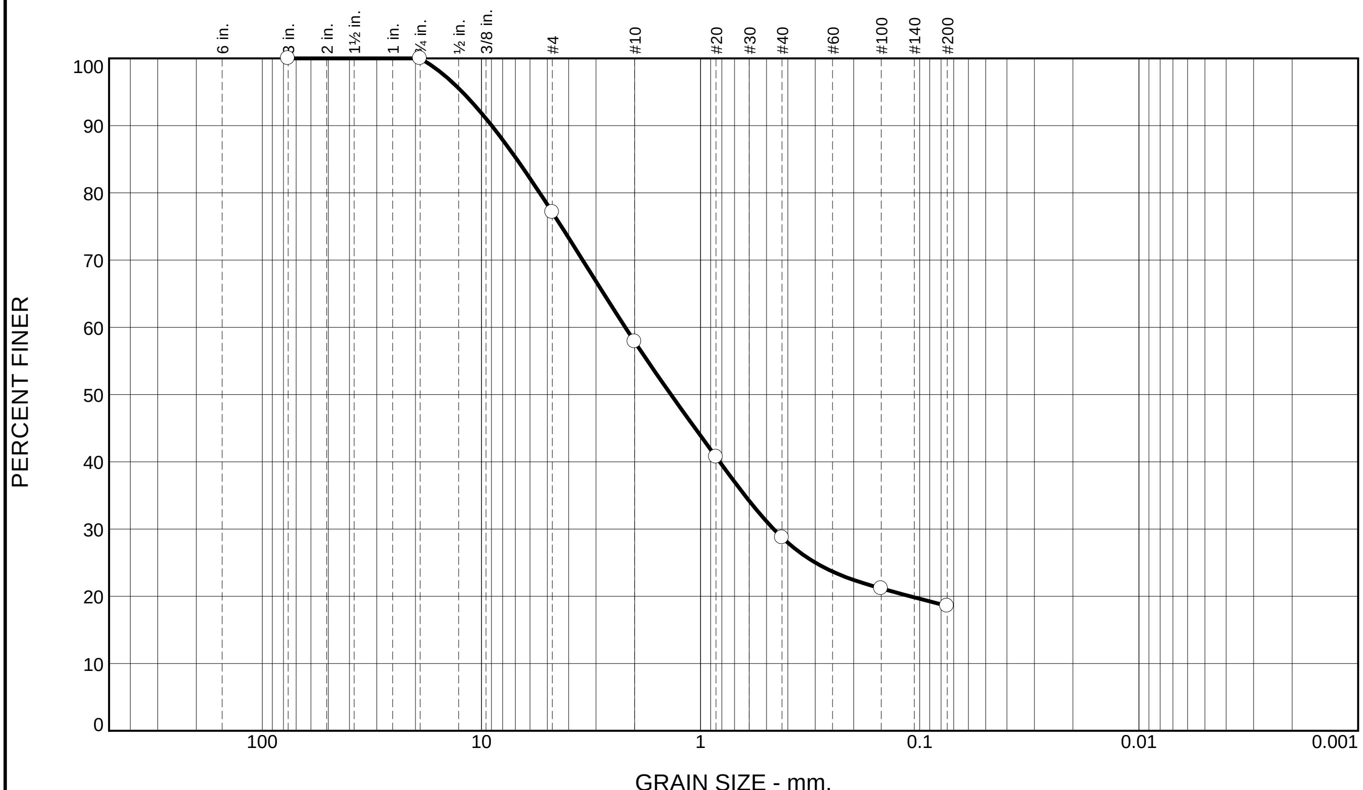
CDM Smith

Cambridge, Massachusetts

Figure

Tested By: ○ JC □ JB **Checked By:** BFM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	22.9	19.2	29.2	10.1	18.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	77.1		
#10	57.9		
#20	40.7		
#40	28.7		
#100	21.2		
#200	18.6		

* (no specification provided)

Material Description

Silty sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 8.9813 D_{85}= 6.9014 D_{60}= 2.2069
D_{50}= 1.3654 D_{30}= 0.4648 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

As received moisture content=13.5%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-2 **Depth:** 44-46
Sample Number: S-16

Date: 2/23/15

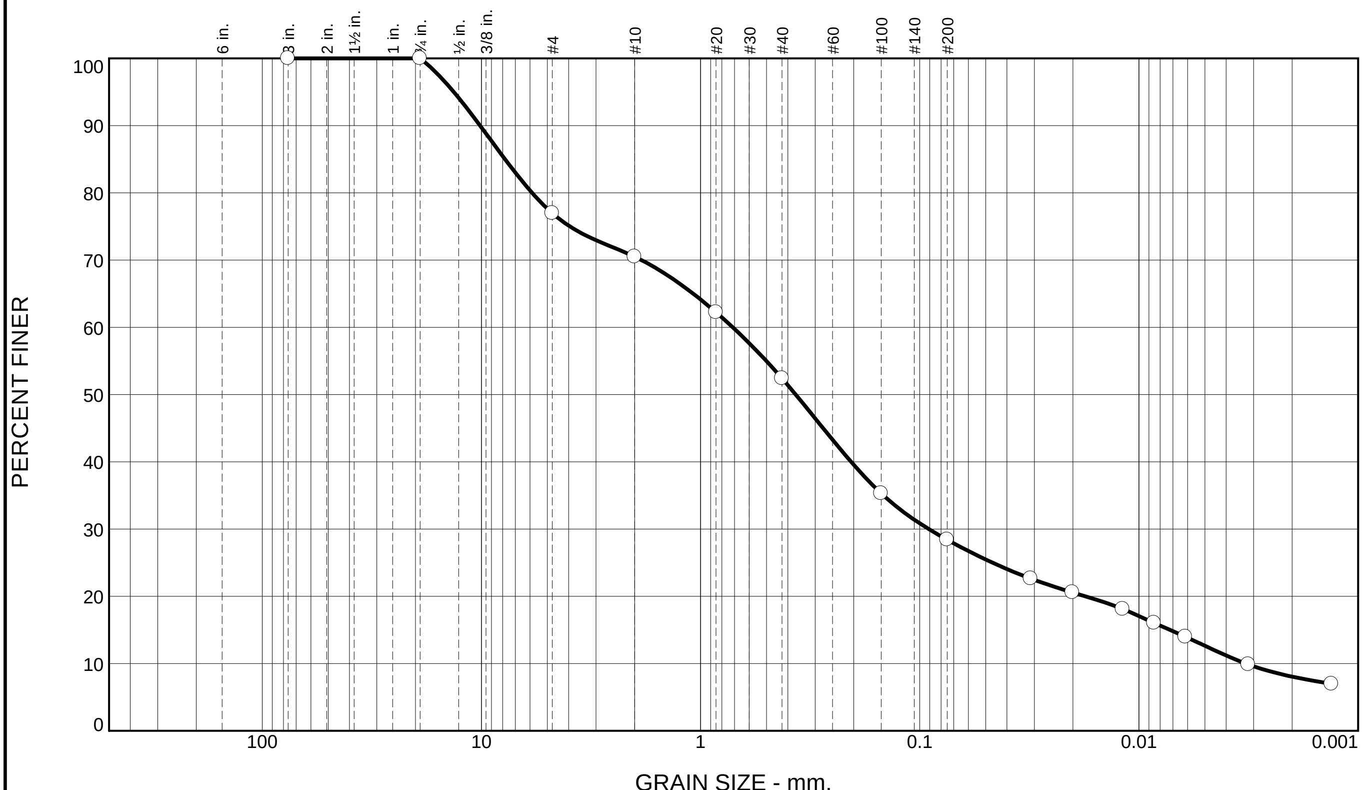
CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	23.0	6.5	18.1	24.0	15.8	12.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	77.0		
#10	70.5		
#20	62.2		
#40	52.4		
#100	35.3		
#200	28.4		

* (no specification provided)

Material Description

Silty sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 10.1475 D_{85}= 7.8042 D_{60}= 0.7135
D_{50}= 0.3681 D_{30}= 0.0910 D_{15}= 0.0072
D_{10}= 0.0033 C_u= 219.19 C_c= 3.56

Classification

USCS= SM AASHTO=

Remarks

As received moisture content=13.8%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-3 **Depth:** 5-7
Sample Number: S-3 **Date:** 2/26/15

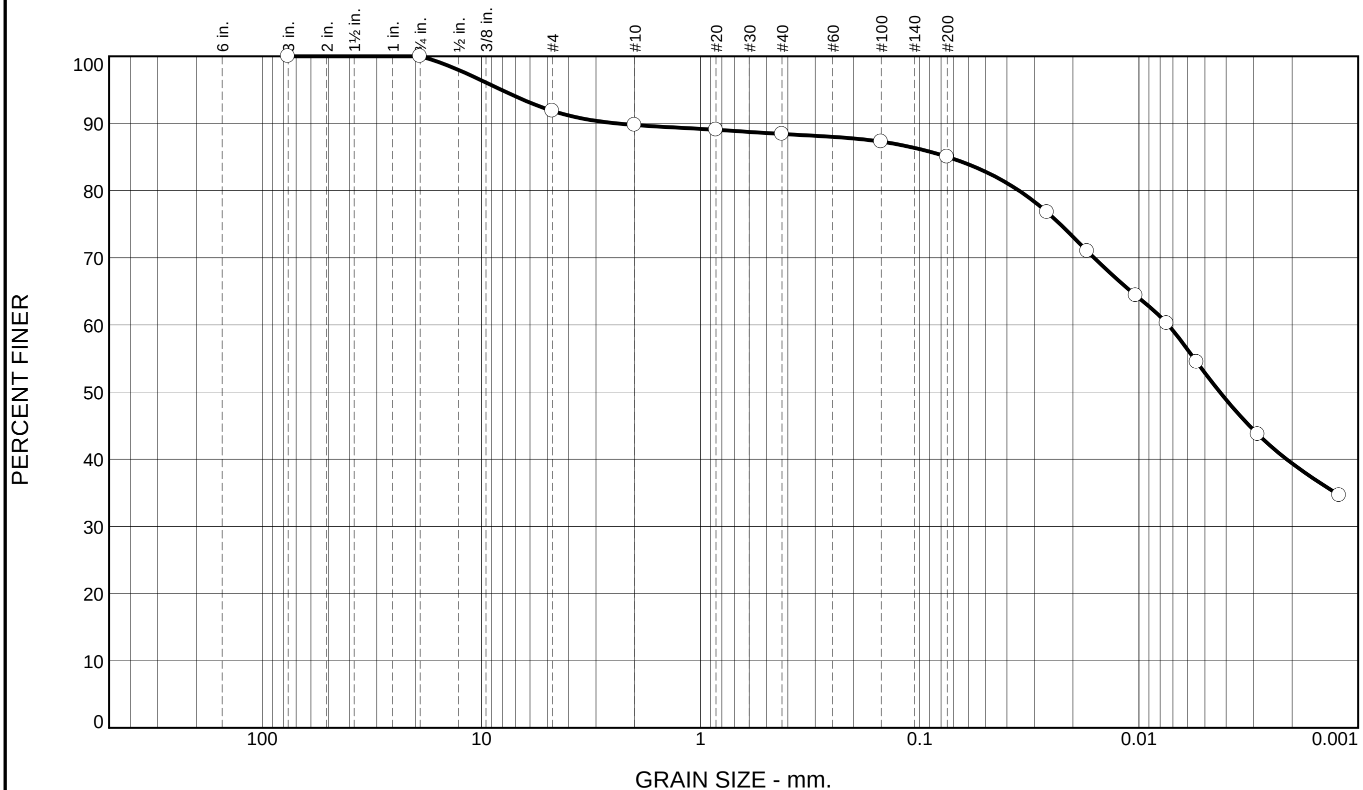
CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	8.1	2.1	1.4	3.4	32.2	52.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	91.9		
#10	89.8		
#20	89.1		
#40	88.4		
#100	87.3		
#200	85.0		

* (no specification provided)

Material Description

Lean clay with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 2.4067 D_{85}= 0.0746 D_{60}= 0.0074
D_{50}= 0.0043 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

As received moisture content=27.1%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-3 **Depth:** 11-13
Sample Number: S-6 **Date:** 2/27/15

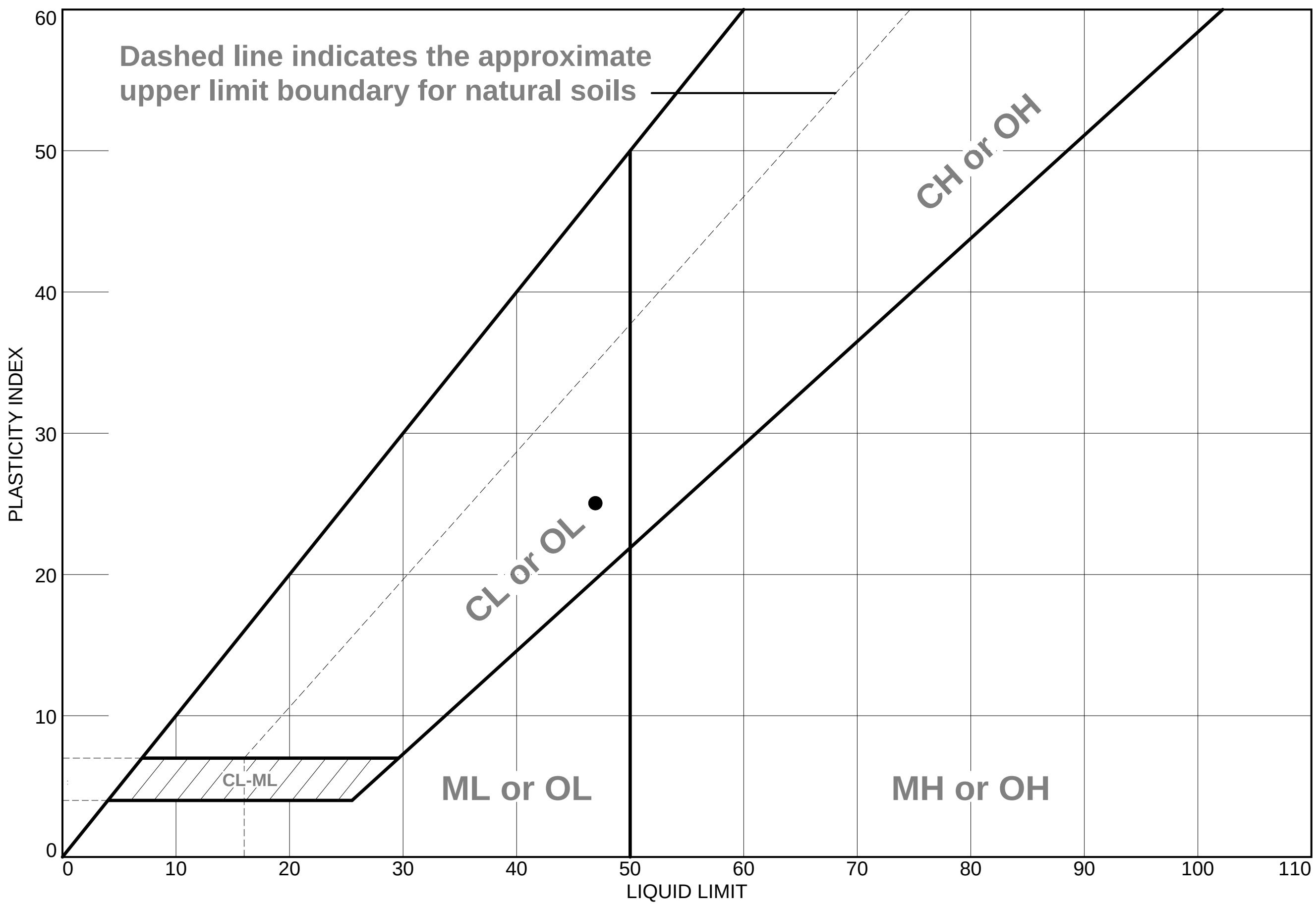
CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean clay	47	22	25			CL

Project No. 0139-107911 **Client:** City of Cambridge

Project: King Open School and Cambridge Street Upper Schools and Community Complex

●**Source of Sample:** CDM-3 **Depth:** 23-25 **Sample Number:** S-12

CDM Smith

Cambridge, Massachusetts

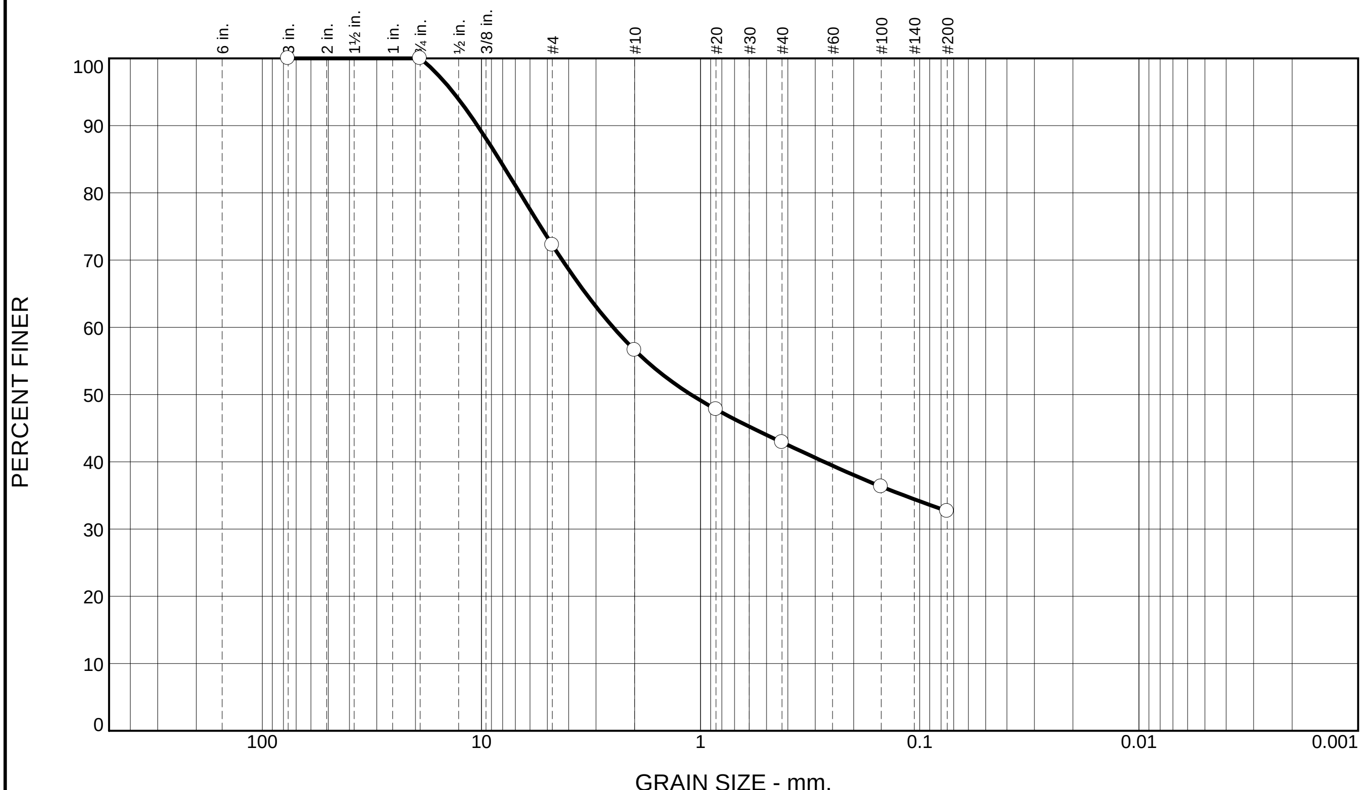
Remarks:

●As received moisture content=40.9%

Figure

Tested By: JB **Checked By:** JC

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	27.8	15.6	13.7	10.2	32.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	72.2		
#10	56.6		
#20	47.8		
#40	42.9		
#100	36.3		
#200	32.7		

* (no specification provided)

Material Description

Silty sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 10.4293 D_{85}= 8.3012 D_{60}= 2.5055
D_{50}= 1.1064 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

As received moisture content=12.7%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-3 **Depth:** 60-62
Sample Number: S-19

Date: 2/27/15

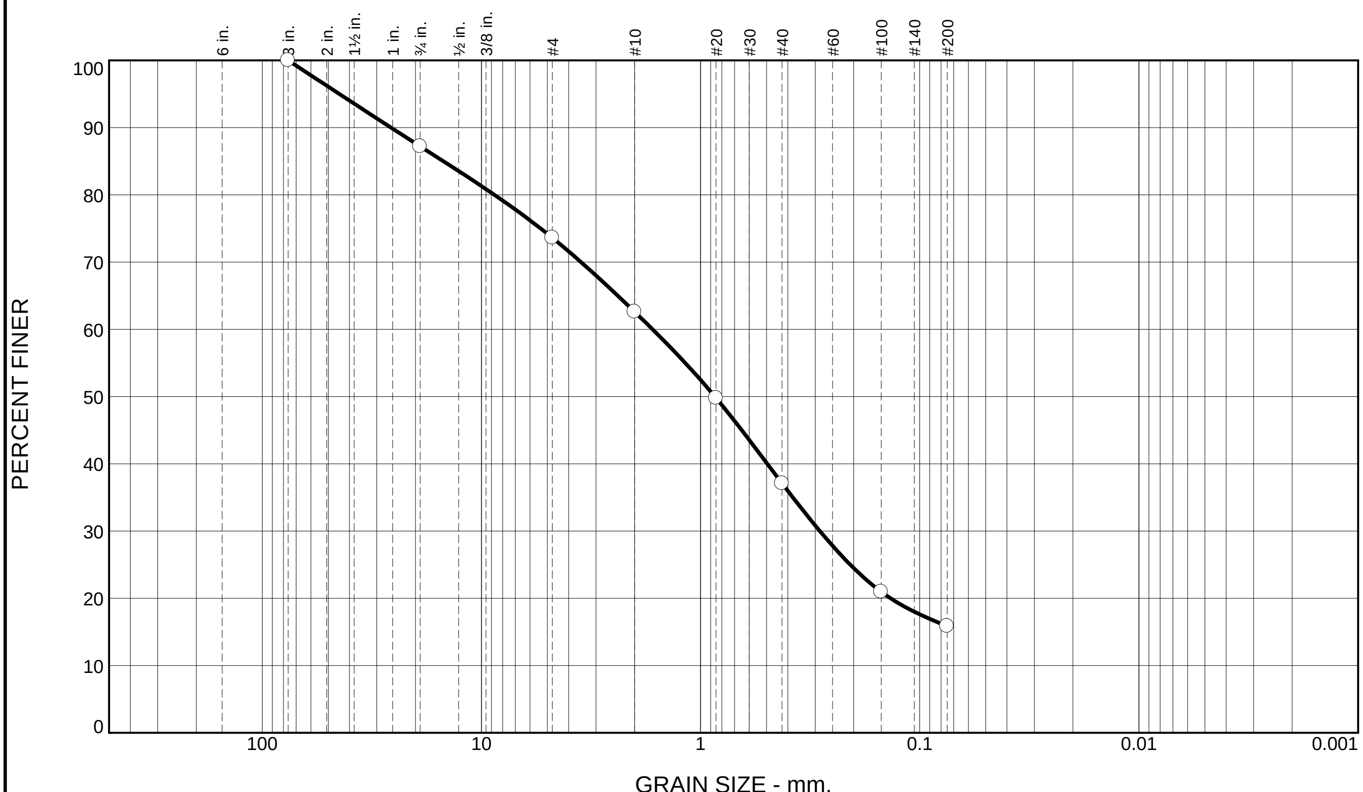
CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.8	13.6	11.0	25.5	21.2	15.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	87.2		
#4	73.6		
#10	62.6		
#20	49.8		
#40	37.1		
#100	21.0		
#200	15.9		

* (no specification provided)

Material Description

Silty sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 25.8750 D_{85}= 14.9253 D_{60}= 1.6575
D_{50}= 0.8605 D_{30}= 0.2857 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SM AASHTO=

Remarks

As received moisture content=23.7%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-4 **Depth:** 5-7
Sample Number: S-3 **Date:** 2/19/15

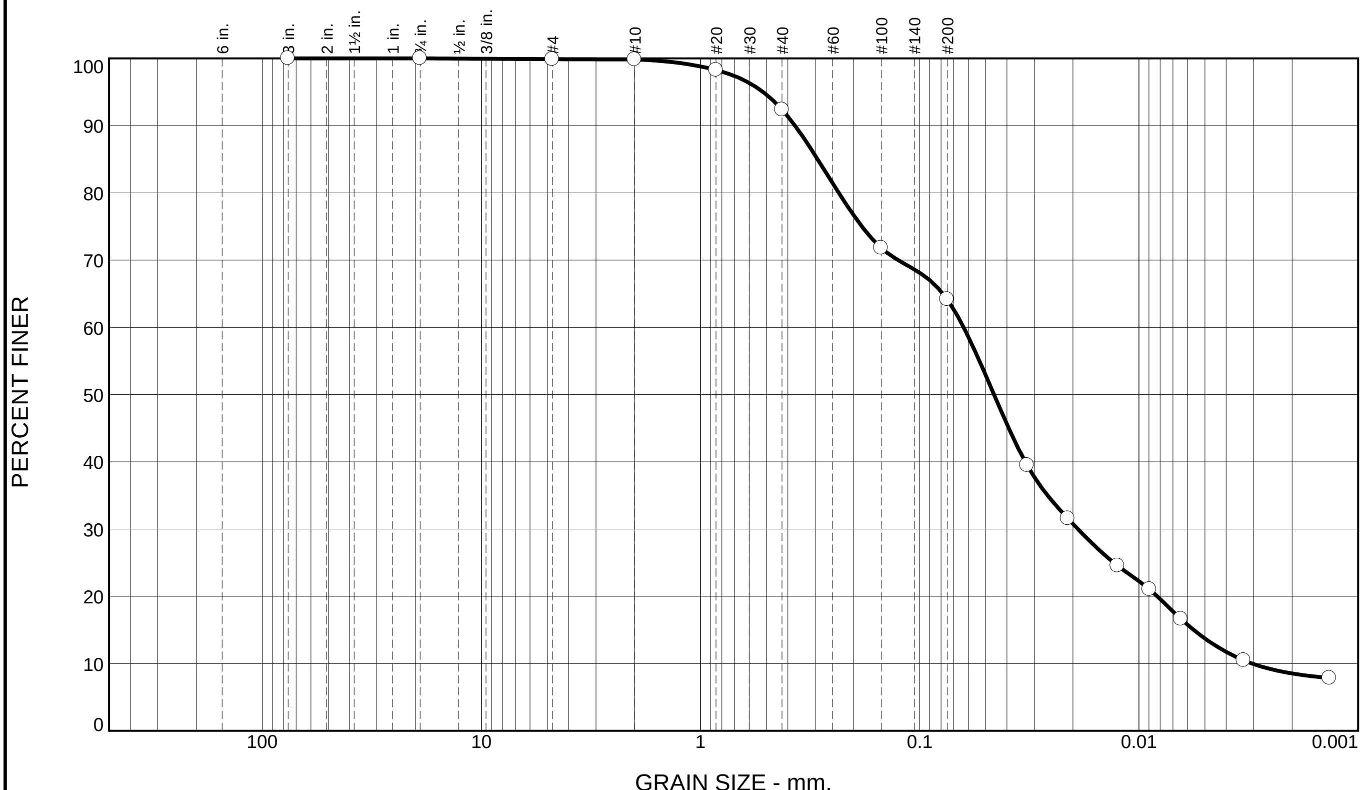
CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.1	7.4	28.2	50.5	13.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	99.9		
#10	99.8		
#20	98.3		
#40	92.4		
#100	71.8		
#200	64.2		

* (no specification provided)

Material Description

Sandy silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.3713 D_{85}= 0.2927 D_{60}= 0.0631
D_{50}= 0.0459 D_{30}= 0.0190 D_{15}= 0.0056
D_{10}= 0.0030 C_u= 20.70 C_c= 1.88

Classification

USCS= ML AASHTO=

Remarks

As received moisture content=14.9%
Fines classification and description based on
Visual Manual Procedure ASTM D2488

Source of Sample: CDM-4 **Depth:** 7-9
Sample Number: S-4 **Date:** 2/19/15

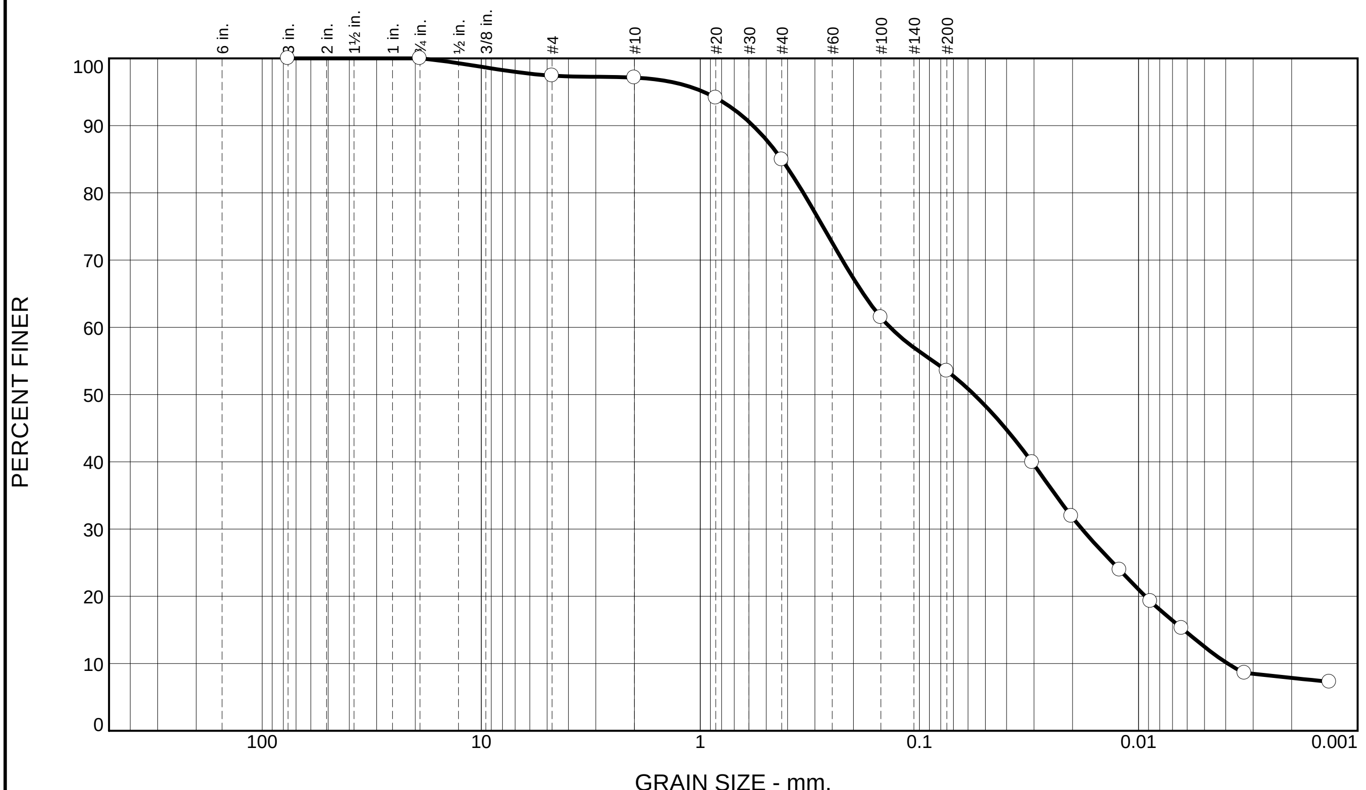
CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.6	0.3	12.1	31.5	41.0	12.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	97.4		
#10	97.1		
#20	94.1		
#40	85.0		
#100	61.5		
#200	53.5		

* (no specification provided)

Material Description

Sandy silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.5753 D_{85}= 0.4260 D_{60}= 0.1362
D_{50}= 0.0563 D_{30}= 0.0181 D_{15}= 0.0062
D_{10}= 0.0039 C_u= 34.74 C_c= 0.61

Classification

USCS= ML AASHTO=

Remarks

As received moisture content=24.7%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-4 **Depth:** 9-11
Sample Number: S-5

Date: 2/19/15

CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

CDM Smith

Geotechnical Engineering Laboratory

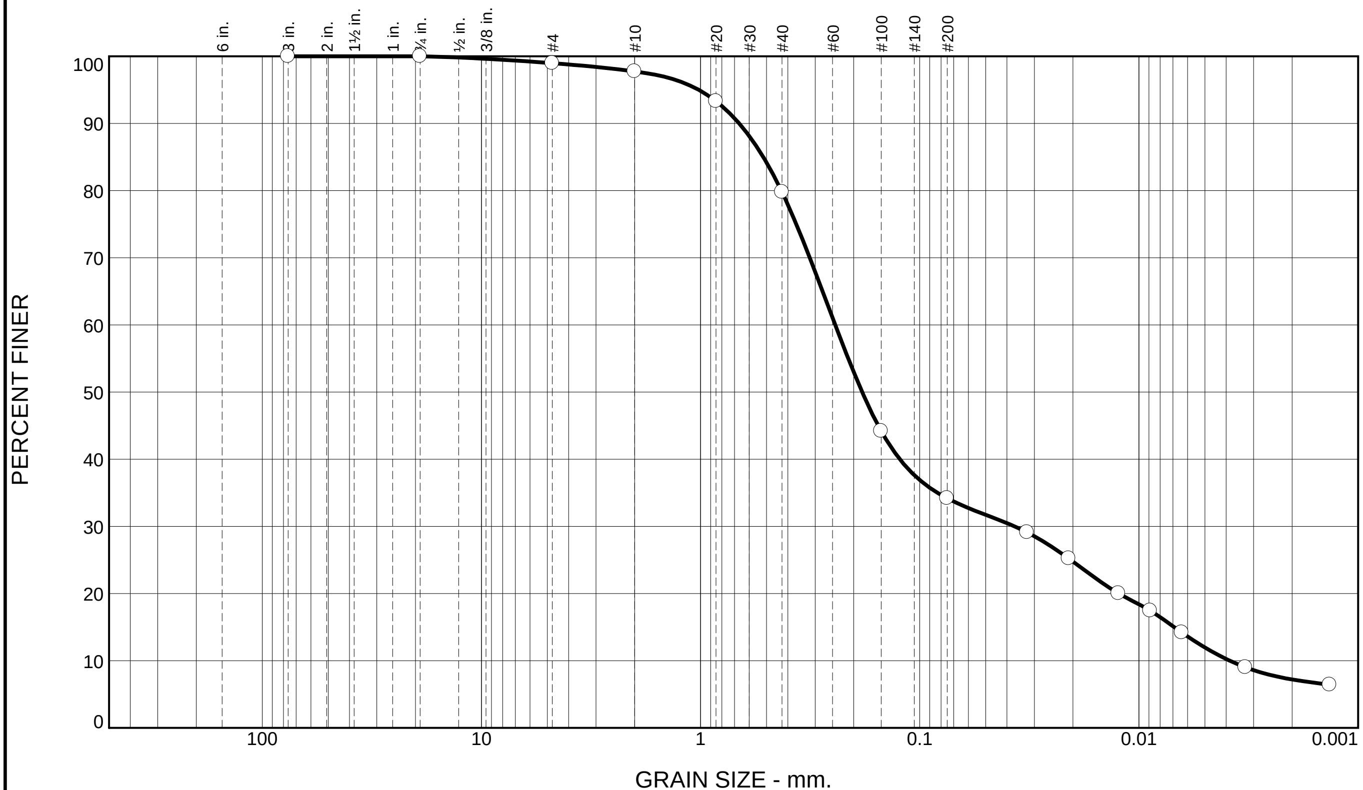
Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils(ASTM D2974)

Client:	City of Cambridge		
Project Name:	King Open School	Tested By:	JB
Project Location:	Cambridge, MA	Test Date:	3/12/2015
Project Number:	0139-107911		
Sample Number:	S-5	Procedure:	C
Sample Location:	CDM-4	Temperature:	440 ^{0}C
Sample Depth (ft):	9-11		
Sample Date:	2/19/2015		
Lab ID Number:	453074333		

AS RECEIVED MOISTURE CONTENT	
Tin Mass (g)	1.40
Wet Mass of Sample & Tin (g)	5.09
Dry Mass of Sample & Tin (g)	4.36
Mass of Water (g)	0.7
Mass of Dry Soil (g)	3.0
Moisture Content (%)	24.7

ASH CONTENT	
Porcelain Dish Mass (g)	18.2
Porcelain Dish + Oven Dried Soil (g)	21.4
Mass of Oven Dried Soil (g)	3.2
Mass of Dish & Burned Soil (g)	21.3
Mass of Burned Soil (g)	3.2
Mass of Organic Material (g)	0.1
Ash Content (%)	98.1
Organic Content (%)	1.9

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.0	1.3	17.9	45.6	22.2	12.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	99.0		
#10	97.7		
#20	93.3		
#40	79.8		
#100	44.2		
#200	34.2		

* (no specification provided)

Material Description

Silty sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.6670 D_{85}= 0.5178 D_{60}= 0.2430
D_{50}= 0.1831 D_{30}= 0.0370 D_{15}= 0.0069
D_{10}= 0.0039 C_u= 63.11 C_c= 1.46

Classification

USCS= SM AASHTO=

Remarks

As received moisture content=17.4%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-4 **Depth:** 11-13
Sample Number: S-6

Date: 2/19/15

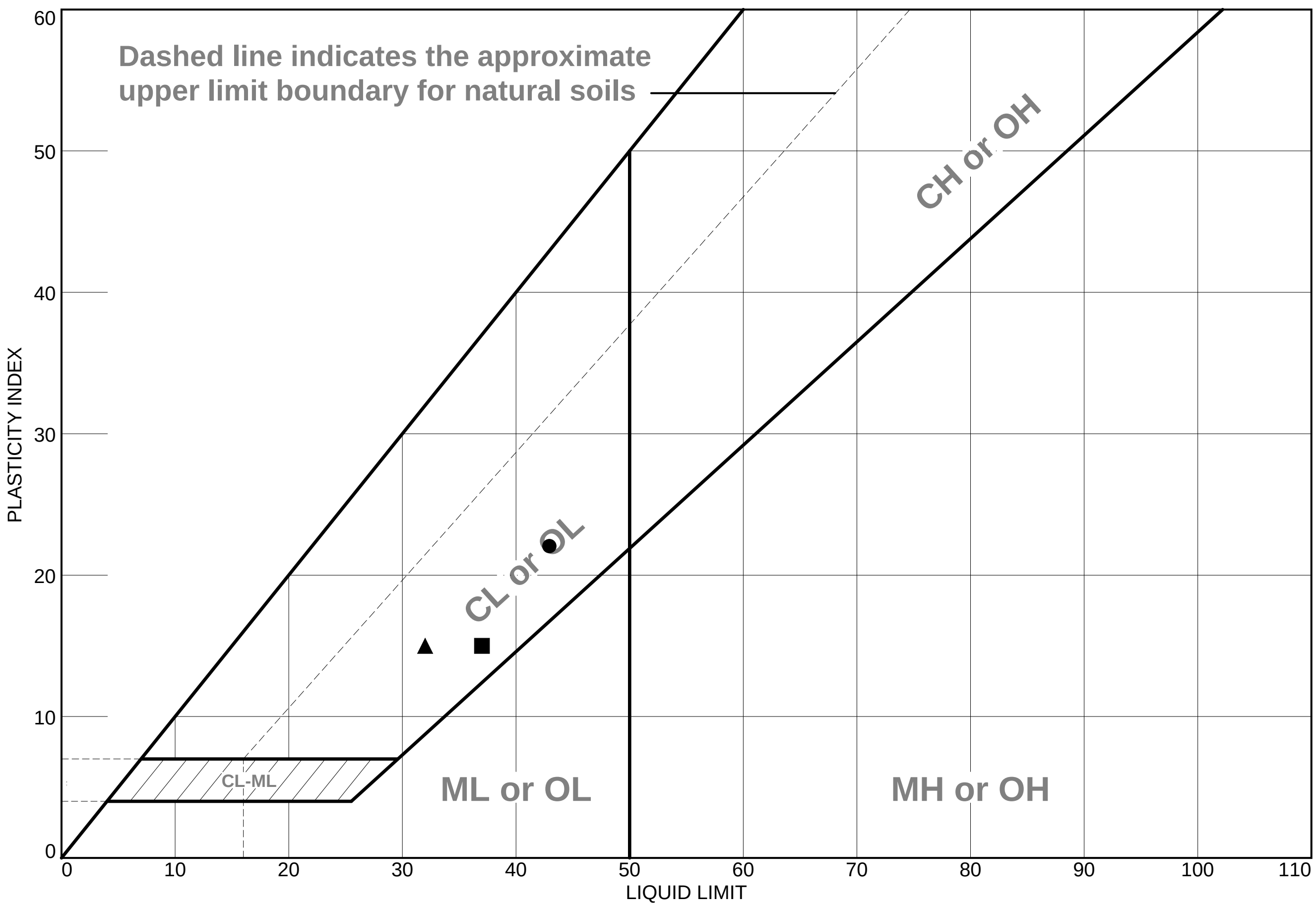
CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lena clay	43	21	22			CL
■	Lean clay	37	22	15	100.0	99.9	CL
▲		32	17	15			CL

Project No. 0139-107911 **Client:** City of Cambridge

Project: King Open School and Cambridge Street Upper Schools and Community Complex

●**Source of Sample:** CDM-4 **Depth:** 17-19 **Sample Number:** S-9
■**Source of Sample:** CDM-4 **Depth:** 46-48 **Sample Number:** U-19
▲**Source of Sample:** CDM-4 **Depth:** 59-61 **Sample Number:** S-22

Remarks:
●As received moisture content=38.3%
■As received moisture content=37.4%
▲As received moisture content=18.3%

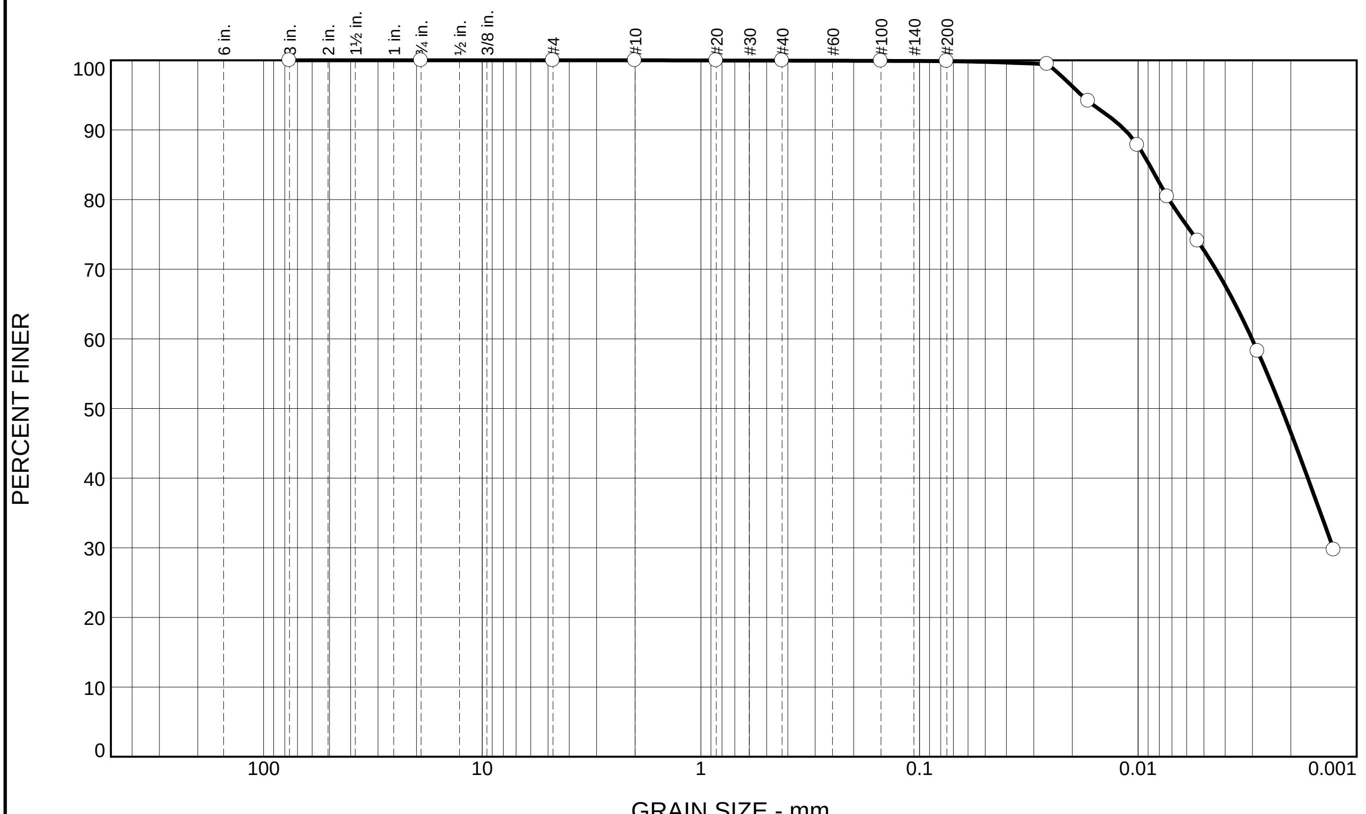
CDM Smith

Cambridge, Massachusetts

Figure

Tested By: ○ JC □ JB △ JC **Checked By:** BFM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.0	0.1	27.2	72.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	100.0		
#10	100.0		
#20	100.0		
#40	100.0		
#100	99.9		
#200	99.9		

* (no specification provided)

Material Description

Lean clay

Atterberg Limits

PL= 22 LL= 37 PI= 15

Coefficients

D_{90}= 0.0115 D_{85}= 0.0089 D_{60}= 0.0030
D_{50}= 0.0022 D_{30}= 0.0013 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-6(16)

Remarks

As received moisture content=35.6%

Source of Sample: CDM-4 **Depth:** 46-48
Sample Number: U-19 **Date:**

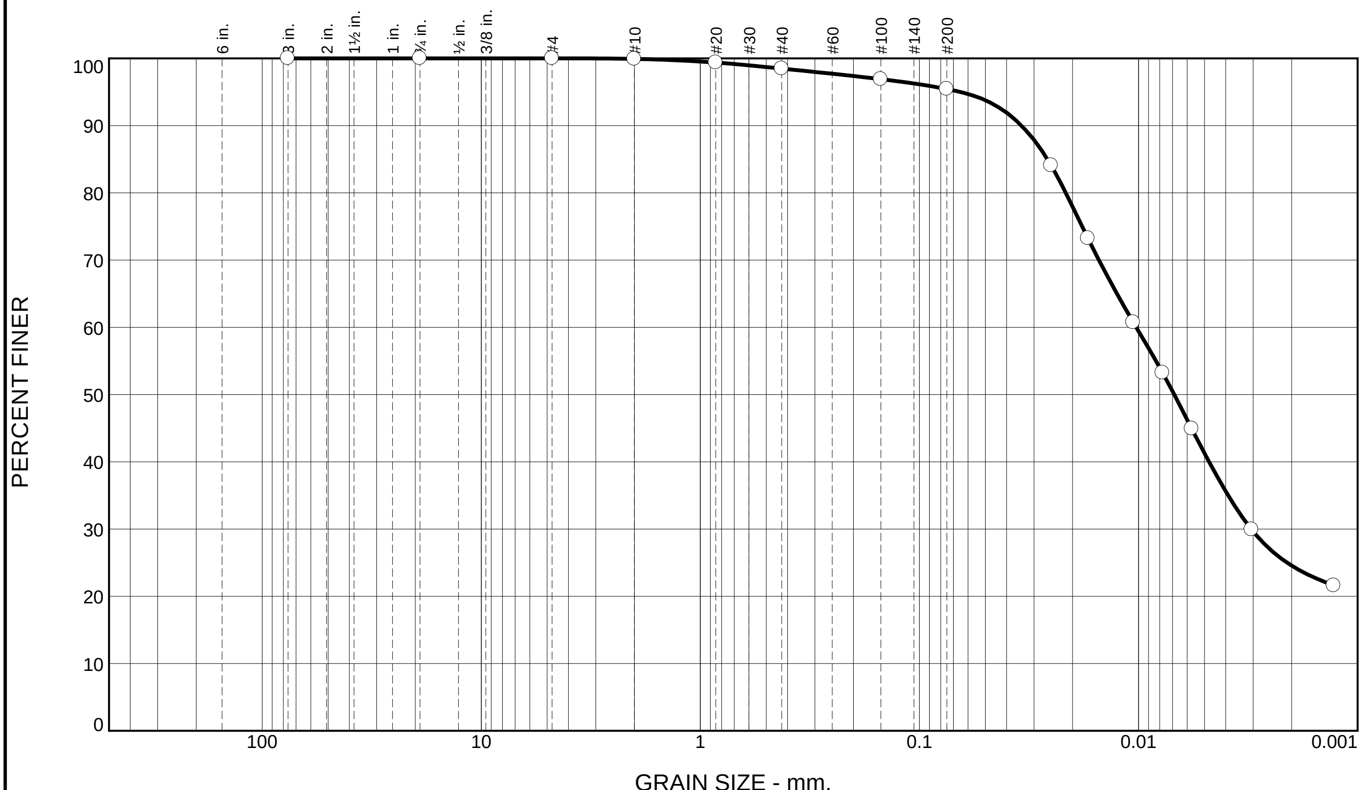
CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

100

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	1.4	3.1	54.1	41.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	100.0		
#10	99.9		
#20	99.4		
#40	98.5		
#100	96.9		
#200	95.4		

* (no specification provided)

Material Description

Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.0342 D_{85}= 0.0261 D_{60}= 0.0102
D_{50}= 0.0069 D_{30}= 0.0031 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

As received moisture content=24.5%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-5 **Depth:** 9-11
Sample Number: S-5 **Date:** 2/17/15

CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

CDM Smith

Geotechnical Engineering Laboratory

Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils(ASTM D2974)

Client: City of Cambridge
Project Name: King Open School
Project Location: Cambridge, MA
Project Number: 0139-107911
Sample Number: S-5
Sample Location: CDM-5
Sample Depth (ft): 9-11
Sample Date: 2/17/2015
Lab ID Number: 453074338

Tested By: JB
Test Date: 3/12/2015
Procedure: C
Temperature: 440 ^{0}C

AS RECEIVED MOISTURE CONTENT	
Tin Mass (g)	1.40
Wet Mass of Sample & Tin (g)	16.52
Dry Mass of Sample & Tin (g)	13.54
Mass of Water (g)	3.0
Mass of Dry Soil (g)	12.1
Moisture Content (%)	24.5

ASH CONTENT	
Porcelain Dish Mass (g)	19.5
Porcelain Dish + Oven Dried Soil (g)	31.7
Mass of Oven Dried Soil (g)	12.1
Mass of Dish & Burned Soil (g)	31.5
Mass of Burned Soil (g)	12.0
Mass of Organic Material (g)	0.2
Ash Content (%)	98.6
Organic Content (%)	1.4

CDM Smith

Geotechnical Engineering Laboratory

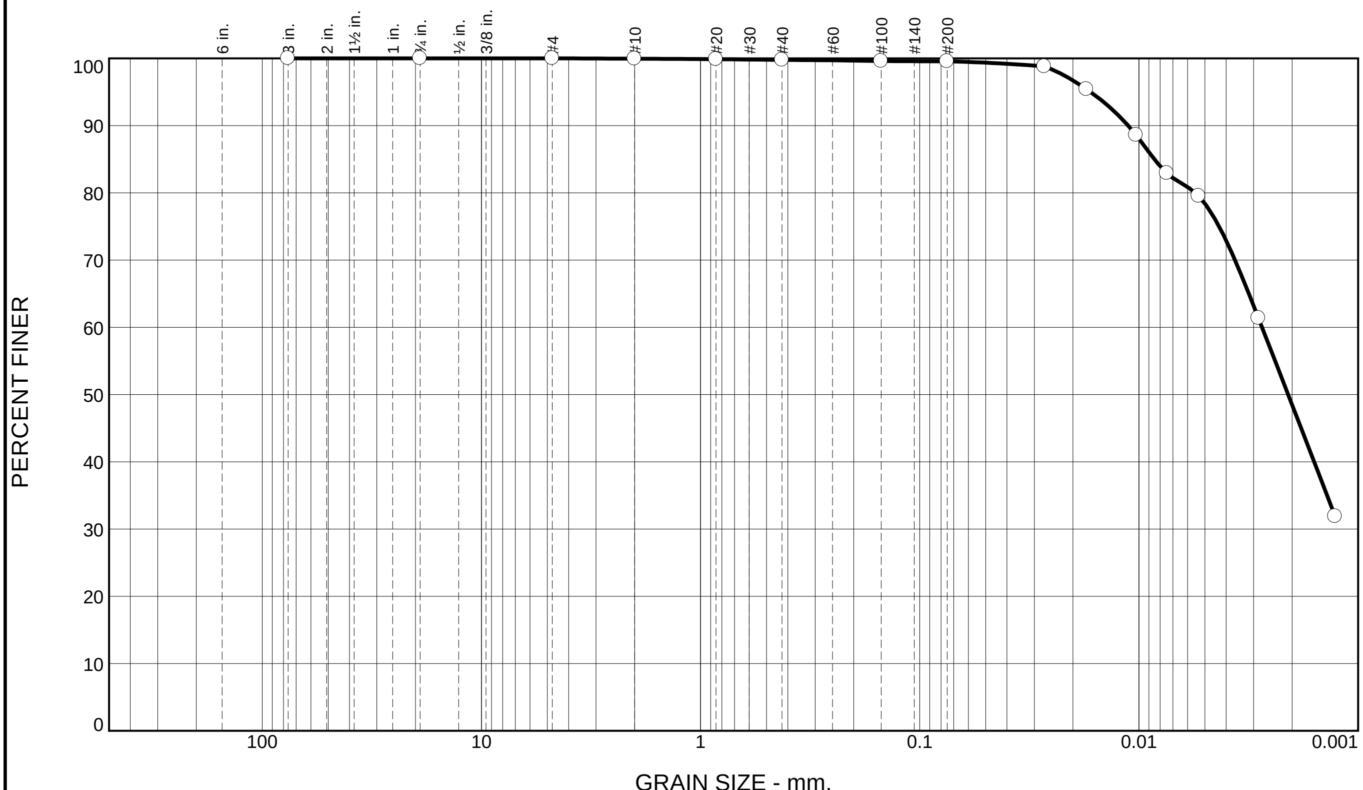
Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils(ASTM D2974)

Client:	City of Cambridge		
Project Name:	King Open School	Tested By:	JB
Project Location:	Cambridge, MA	Test Date:	3/12/2015
Project Number:	0139-107911		
Sample Number:	S-7	Procedure:	C
Sample Location:	CDM-5	Temperature:	440 ^{0}C
Sample Depth (ft):	13-15		
Sample Date:	2/17/2015		
Lab ID Number:	453074339		

AS RECEIVED MOISTURE CONTENT	
Tin Mass (g)	1.40
Wet Mass of Sample & Tin (g)	16.60
Dry Mass of Sample & Tin (g)	13.64
Mass of Water (g)	3.0
Mass of Dry Soil (g)	12.2
Moisture Content (%)	24.2

ASH CONTENT	
Porcelain Dish Mass (g)	19.5
Porcelain Dish + Oven Dried Soil (g)	31.8
Mass of Oven Dried Soil (g)	12.3
Mass of Dish & Burned Soil (g)	31.6
Mass of Burned Soil (g)	12.1
Mass of Organic Material (g)	0.2
Ash Content (%)	98.1
Organic Content (%)	1.9

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.1	0.2	21.2	78.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	100.0		
#10	99.9		
#20	99.9		
#40	99.8		
#100	99.6		
#200	99.6		

* (no specification provided)

Material Description

Lean clay

Atterberg Limits

PL= 22 LL= 42 PI= 20

Coefficients

D_{90}= 0.0112 D_{85}= 0.0085 D_{60}= 0.0027
D_{50}= 0.0021 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CL AASHTO= A-7-6(22)

Remarks

As received moisture content=37.1%

Source of Sample: CDM-5 **Depth:** 49-51
Sample Number: S-17 **Date:** 2/17/2015

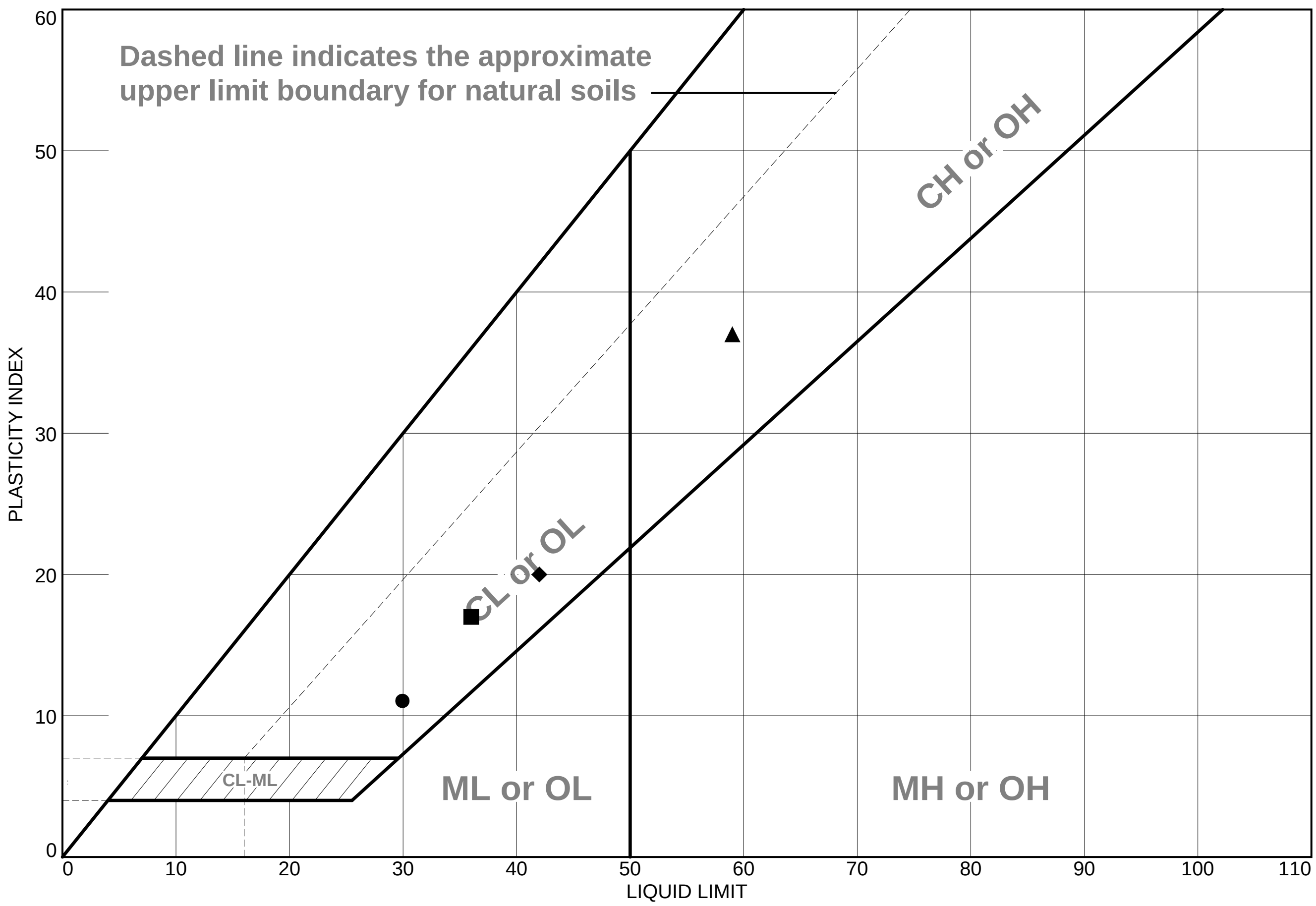
CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** BFM

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean clay	30	19	11			CL
■	Lean clay	36	19	17			CL
▲	Fat clay	59	22	37			CH
◆	Lean clay	42	22	20			CL

Project No. **Client:**

Project:

●**Source of Sample:** CDM-5 **Depth:** 13-15 **Sample Number:** S-7
■**Source of Sample:** CDM-5 **Depth:** 54-56 **Sample Number:** S-18
▲**Source of Sample:** CDM-5 **Depth:** 19-21 **Sample Number:** U-10
◆**Source of Sample:** CDM-5 **Depth:** 49-51 **Sample Number:** S-17

Remarks:
●As received moisture content=24.2%
■As received moisture content=33.2%
▲As received moisture content=37.0%
◆As received moisture content=37.1%

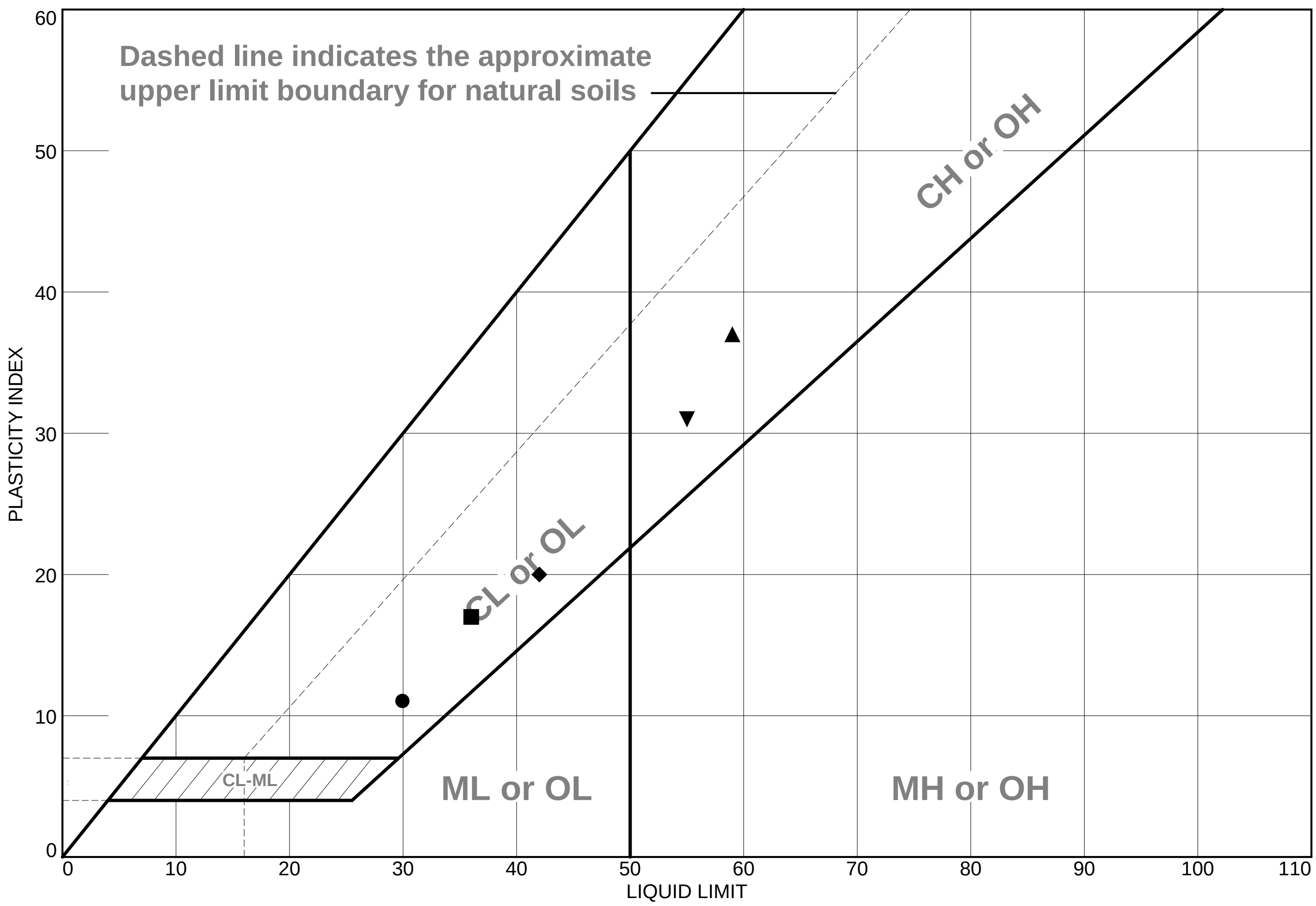
CDM Smith

Cambridge, Massachusetts

Figure

Tested By: ○ JB □ JC △ JB ◇ JB **Checked By:** JC

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean clay	30	19	11			CL
■	Lean clay	36	19	17			CL
▲	Fat clay	59	22	37	99.9	99.7	CH
◆	Lean clay	42	22	20	99.8	99.6	CL
▼	Fat clay	55	24	31			CH

Project No. 0139-107911 **Client:** City of Cambridge

Project: King Open School and Cambridge Street Upper Schools and Community Complex

●**Source of Sample:** CDM-5 **Depth:** 13-15 **Sample Number:** S-7
■**Source of Sample:** CDM-5 **Depth:** 54-56 **Sample Number:** S-18
▲**Source of Sample:** CDM-5 **Depth:** 19-21 **Sample Number:** U-10
◆**Source of Sample:** CDM-5 **Depth:** 49-51 **Sample Number:** S-17
▼**Source of Sample:** CDM-5 **Depth:** 19-21 **Sample Number:** U-10(b)

Remarks:
●As received moisture content=24.2%
■As received moisture content=33.2%
▲As received moisture content=37.0%
◆As received moisture content=37.1%
▼As received moisture content=37.8%

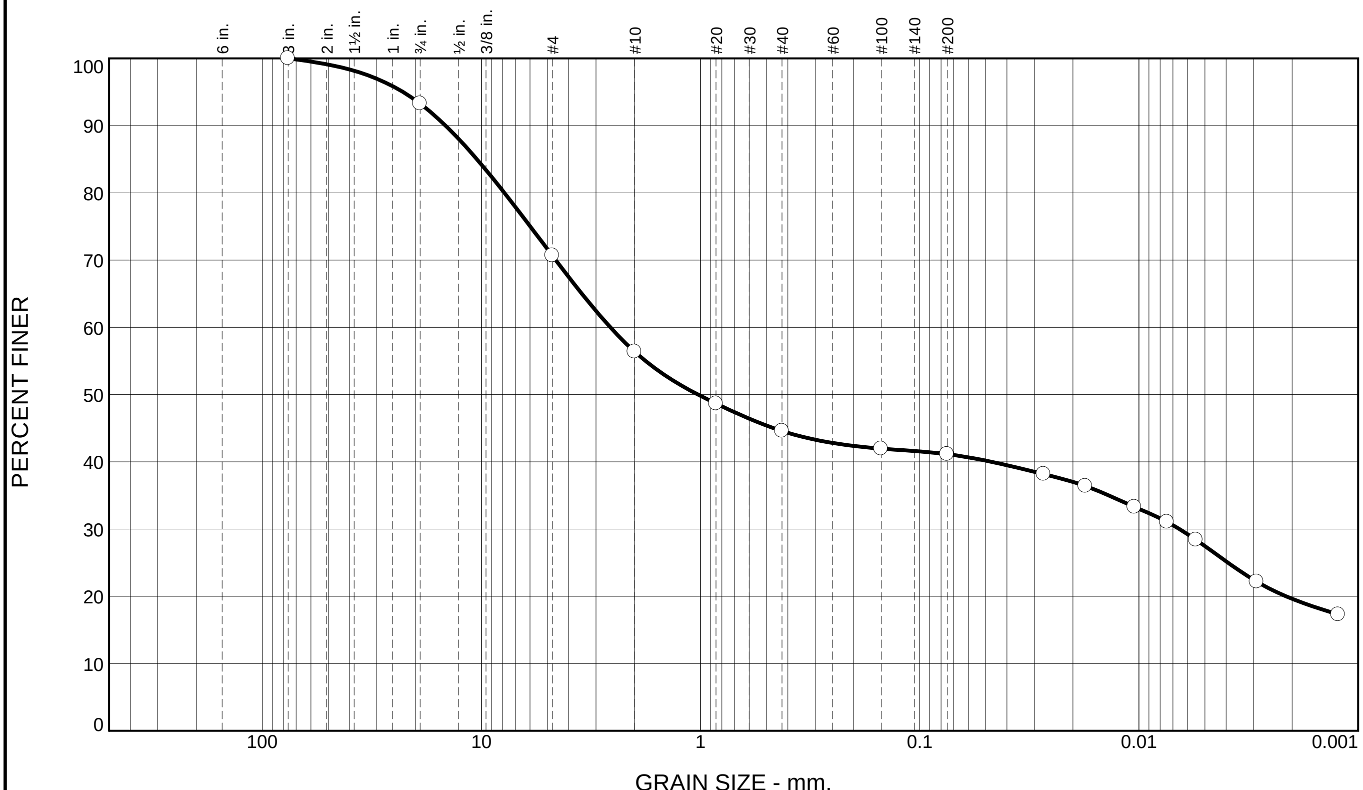
CDM Smith

Cambridge, Massachusetts

Figure

Tested By: ○ JB □ JC △ JB ◇ JB ▽ JB **Checked By:** JC

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.7	22.6	14.3	11.8	3.5	13.6	27.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	93.3		
#4	70.7		
#10	56.4		
#20	48.7		
#40	44.6		
#100	42.0		
#200	41.1		

* (no specification provided)

Material Description

Clayey sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 14.5900 D_{85}= 10.4927 D_{60}= 2.5801
D_{50}= 1.0277 D_{30}= 0.0065 D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= SC AASHTO=

Remarks

As received moisture content=20.8%
Fines classification and description based on Visual Manual Procedure ASTM D2488

Source of Sample: CDM-5 **Depth:** 64-66
Sample Number: S-20 **Date:** 2/17/15

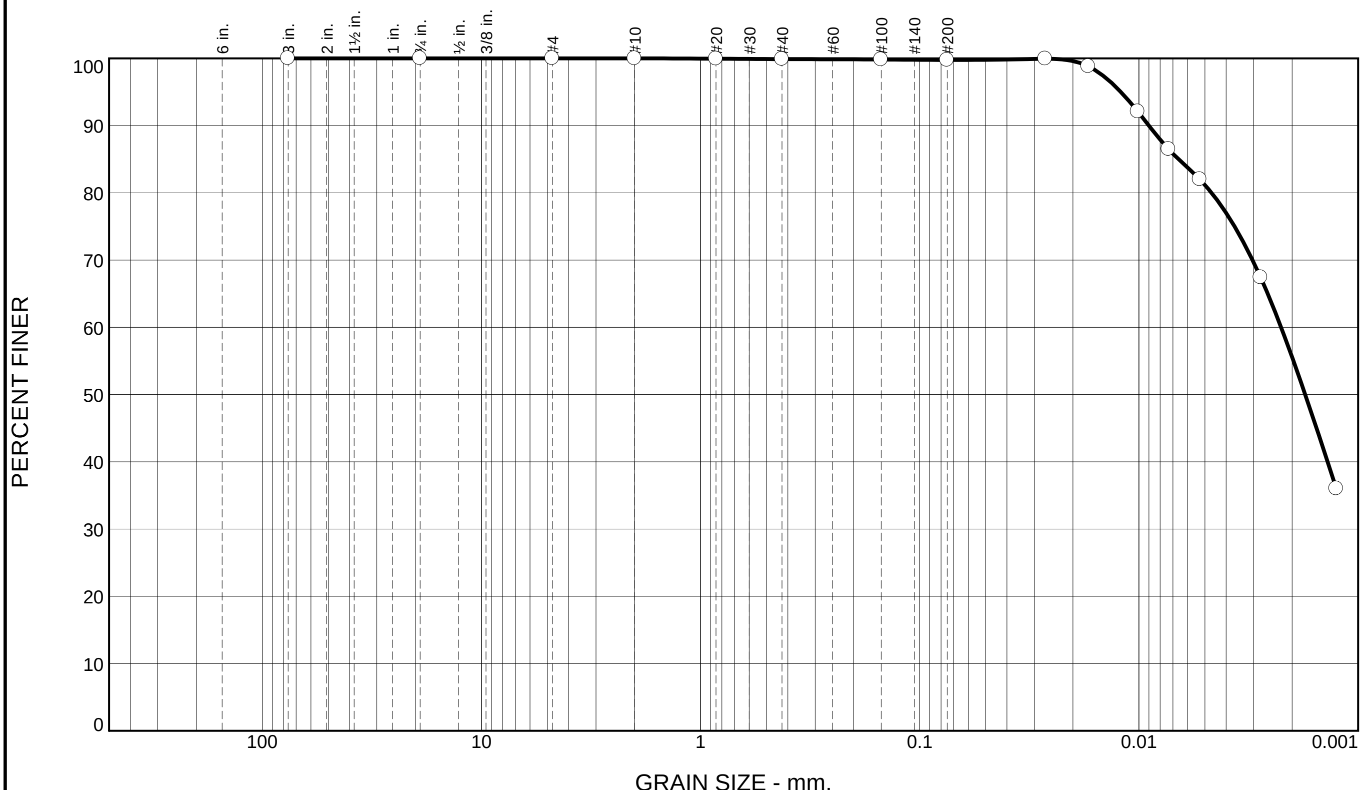
CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	0.2	18.5	81.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	100.0		
#10	100.0		
#20	99.9		
#40	99.9		
#100	99.8		
#200	99.7		

* (no specification provided)

Material Description

Fat clay

Atterberg Limits

PL= 22 LL= 59 PI= 37

Coefficients

D_{90}= 0.0090 D_{85}= 0.0066 D_{60}= 0.0022
D_{50}= 0.0017 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= CH AASHTO= A-7-6(42)

Remarks

As received moisture content=37.8%

Source of Sample: CDM-5 **Depth:** 19-21
Sample Number: U-10 **Date:** 2/17/2015

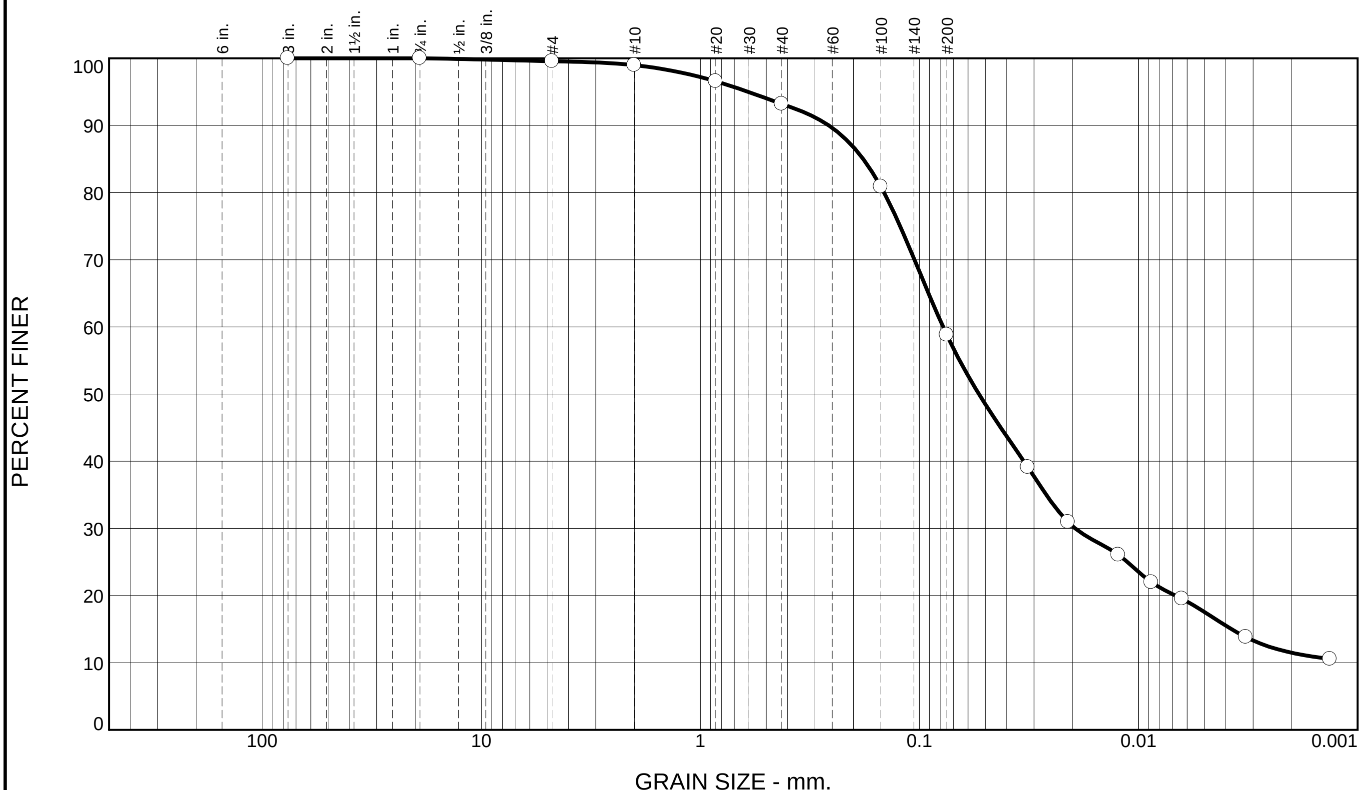
CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** BFM

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.4	0.6	5.8	34.4	41.2	17.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3	100.0		
3/4	100.0		
#4	99.6		
#10	99.0		
#20	96.6		
#40	93.2		
#100	80.9		
#200	58.8		

* (no specification provided)

Material Description

Sandy silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.2595 D_{85}= 0.1805 D_{60}= 0.0780
D_{50}= 0.0535 D_{30}= 0.0195 D_{15}= 0.0038
D_{10}= C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

As received moisture content=18.8%
Fines classification and description based on
Visual Manual Procedure ASTM D2488

Source of Sample: CDM-6 **Depth:** 8-10
Sample Number: S-5 **Date:** 2/18/15

CDM Smith

Cambridge, Massachusetts

Client: City of Cambridge
Project: King Open School and Cambridge Street Upper Schools and Community Complex
Project No: 0139-107911 **Figure**

Tested By: JB **Checked By:** JC

CDM Smith

Geotechnical Engineering Laboratory

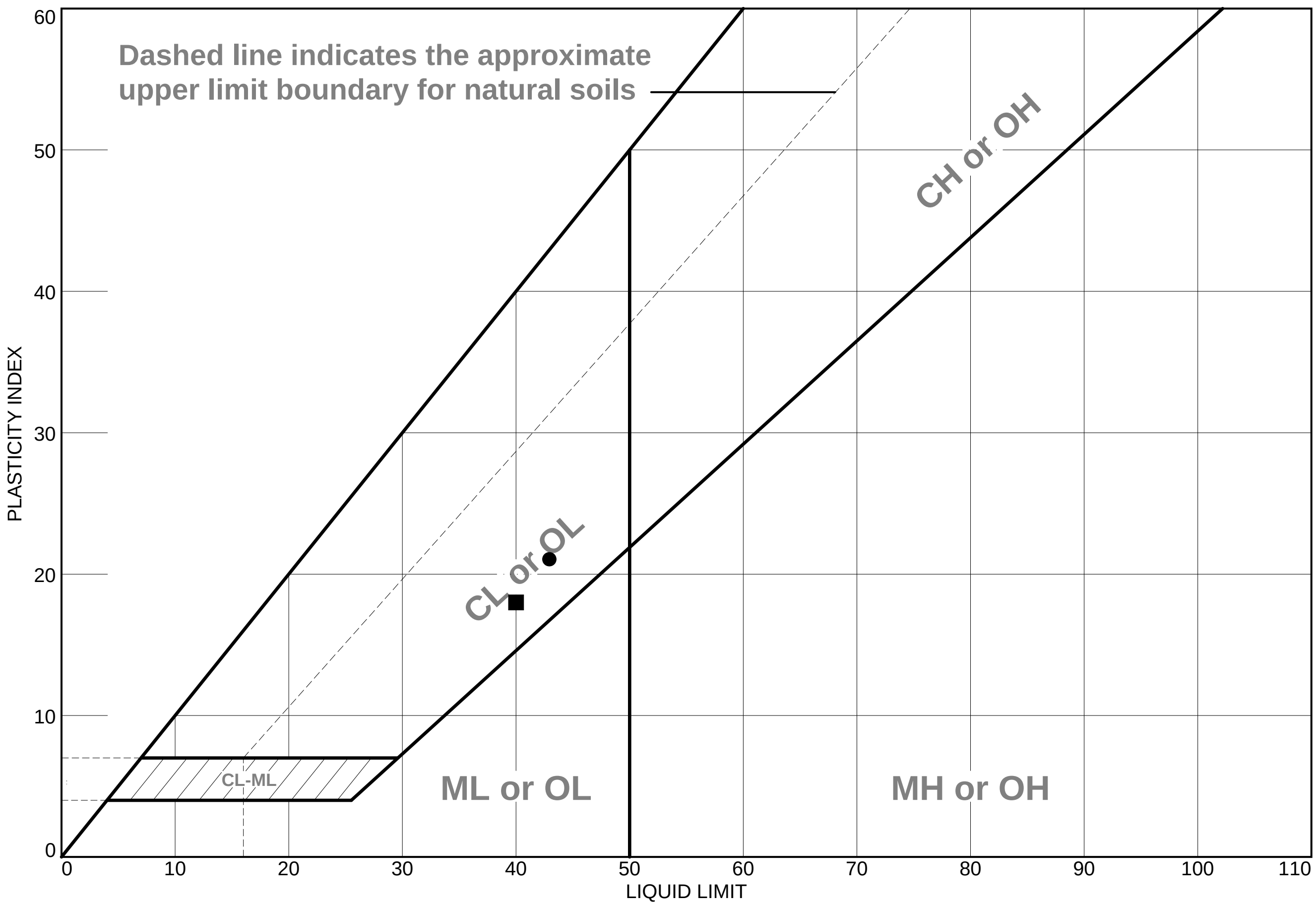
Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils(ASTM D2974)

Client:	City of Cambridge		
Project Name:	King Open School	Tested By:	JB
Project Location:	Cambridge, MA	Test Date:	3/12/2015
Project Number:	0139-107911		
Sample Number:	S-5	Procedure:	C
Sample Location:	CDM-6	Temperature:	440 ^{0}C
Sample Depth (ft):	8-10		
Sample Date:	2/18/2015		
Lab ID Number:	453074343		

AS RECEIVED MOISTURE CONTENT	
Tin Mass (g)	1.40
Wet Mass of Sample & Tin (g)	21.04
Dry Mass of Sample & Tin (g)	17.93
Mass of Water (g)	3.1
Mass of Dry Soil (g)	16.5
Moisture Content (%)	18.8

ASH CONTENT	
Porcelain Dish Mass (g)	17.3
Porcelain Dish + Oven Dried Soil (g)	33.9
Mass of Oven Dried Soil (g)	16.5
Mass of Dish & Burned Soil (g)	33.7
Mass of Burned Soil (g)	16.4
Mass of Organic Material (g)	0.2
Ash Content (%)	99.0
Organic Content (%)	1.0

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Lean clay	43	22	21			CL
■	Lean clay	40	22	18			CL

Project No. 0139-107911 **Client:** City of Cambridge

Project: King Open School and Cambridge Street Upper Schools and Community Complex

●**Source of Sample:** CDM-6 **Depth:** 14-16 **Sample Number:** S-8

■**Source of Sample:** CDM-6 **Depth:** 35-37 **Sample Number:** S-15

Remarks:

●As received moisture content=32.7%

■As received moisture content=33.9%

CDM Smith

Cambridge, Massachusetts

Figure

Tested By: ○ JC □ JB **Checked By:** BFM

CDM Smith Geotechnical Engineering Laboratory

CRS CONSOLIDATION TEST SUMMARY - ASTM D4186

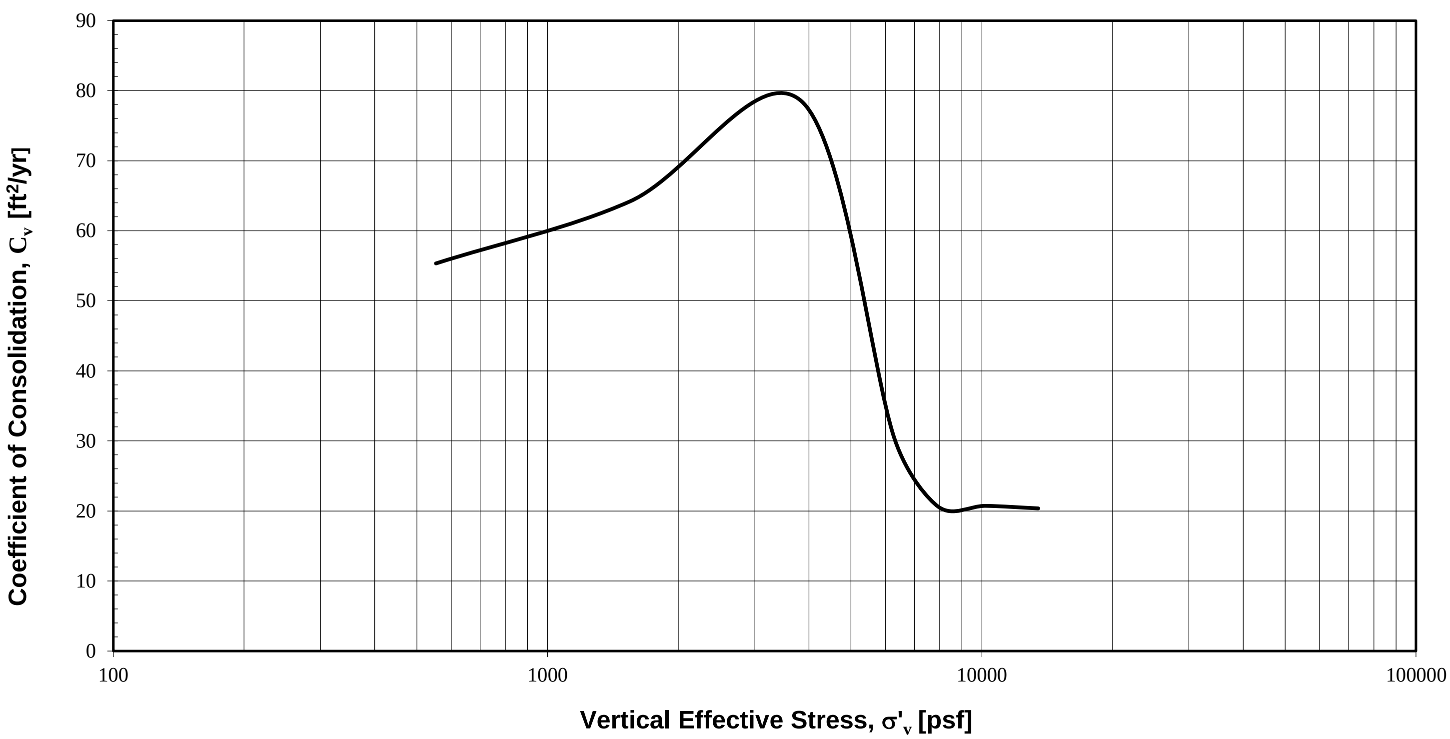
Client:	City of Cambridge	**Test Date:**	3/10/2015
Project:	King Open School	**Exploration No:**	CDM-4
Location:	Cambridge, MA	**Sample No:**	U-2
Project No:	00139-107911	**Depth (ft):**	47
		Sample Description:	Lean Clay - CL

	Initial	Final
Wet Mass (g)	147.06	135.28
Dry Mass (g)	103.15	103.15
Moisture Content (%):	42.6	31.1
Moist Unit Weight (pcf):	113.9	104.8
Dry Unit Weight (pcf):	79.9	79.9
Diameter (in):	2.50	2.50
Height (in)(*):	1.00	0.81
Void Ratio (-)(*):	1.12	0.73
Saturation (%):	100.0	100.0
Moisture Content (Trim -%):	37.4	

Atterberg Limits:

LL :	37
PL :	22
PI :	15

Consolidation Strain Rate (%/hr):	0.79
Final Back Pressure (psi):	60
Seating Pressure (psi):	2



Notes:

1. Consolidation test performed in accordance with ASTM D4186.
2. Value of Specific gravity Gs is assumed

(*) Reported final data are taken at maximum deformation

Test Remarks:

Sample description: Silty CLAY, trace fine sand

Exploration No:	CDM-4	**Preconsolidation Pressure (psf):**	5,400
Sample No:	U-2	**Estimated In Situ Pressure (psf):**	3,692
Depth (ft):	47	**Compression Ratio, CR:**	0.212
Sample Description:	Lean Clay - CL	**Recompression Ratio, RR:**	0.030

CDM Smith
Geotechnical Engineering Laboratory

Client: City of Cambridge
Project: King Open School
Project No: 00139-107911

CONSTANT RATE OF STRAIN CONSOLIDATION TEST
ASTM D4186

CDM Smith Geotechnical Engineering Laboratory

CRS CONSOLIDATION TEST SUMMARY - ASTM D4186

Client: City of Cambridge
Project: King Open School
Location: Cambridge, MA
Project No: 00139-107911

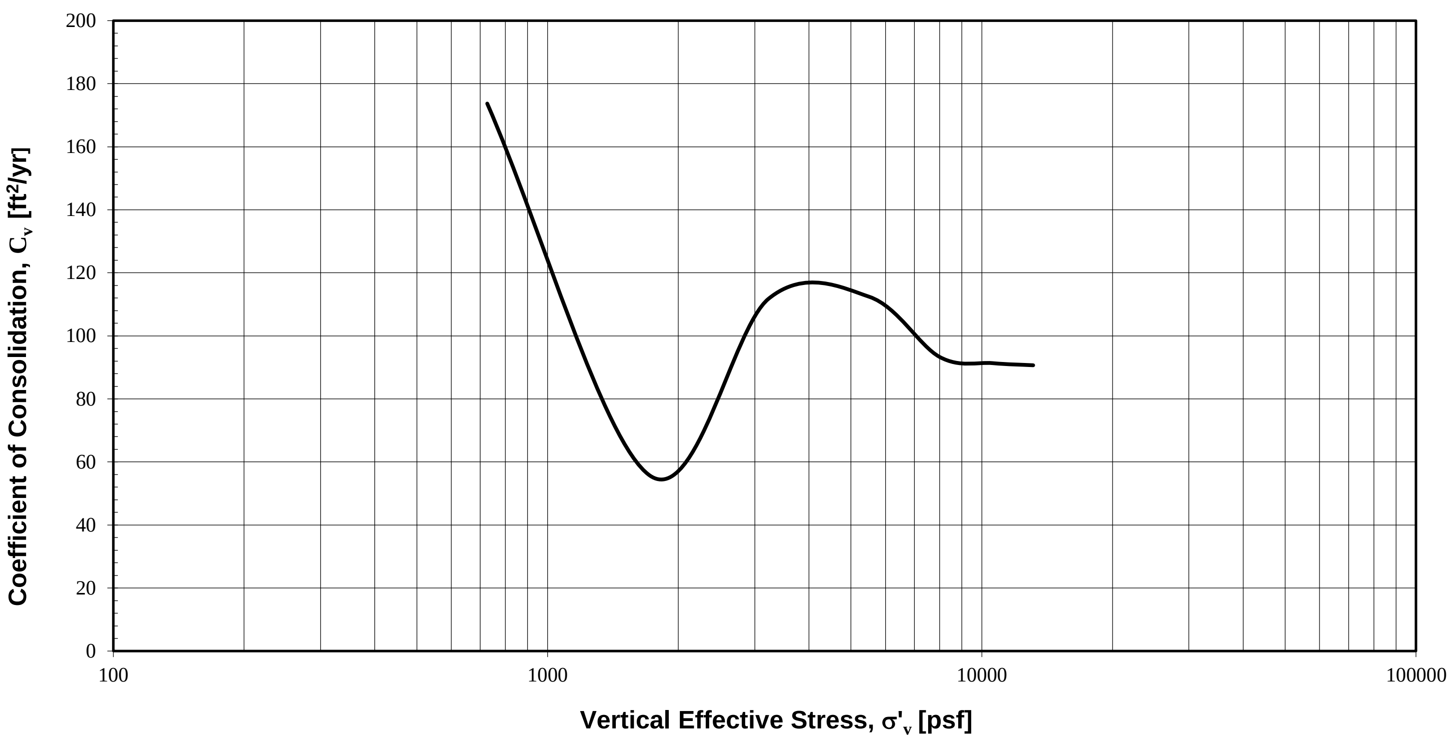
Test Date: 3/10/2015
Exploration No: CDM-5
Sample No: U-1
Depth (ft): 20
Sample Description: Lean Clay - CL

	Initial	Final
Wet Mass (g)	147.53	142.58
Dry Mass (g)	105.33	105.33
Moisture Content (%):	40.1	35.4
Moist Unit Weight (pcf):	114.3	110.4
Dry Unit Weight (pcf):	81.6	81.6
Diameter (in):	2.50	2.50
Height (in)(*):	1.00	0.85
Void Ratio (-)(*):	1.10	0.79
Saturation (%):	100.0	100.0
Moisture Content (Trim -%):	36.9	

Atterberg Limits:

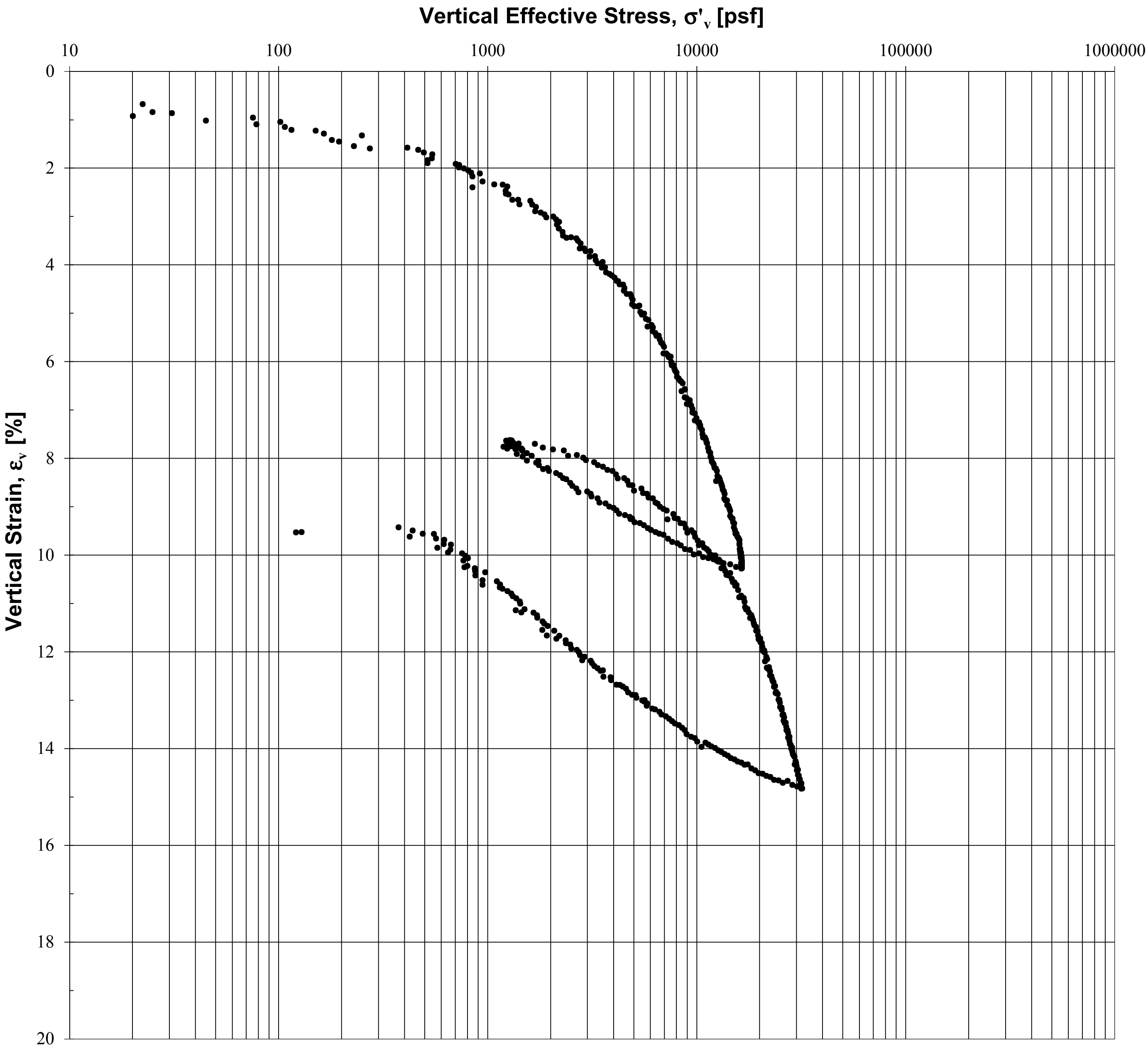
LL : 59
PL : 22
PI : 37

Consolidation Strain Rate (%/hr): 0.69
Final Back Pressure (psi): 60
Seating Pressure (psi): 2



Notes:
1. Consolidation test performed in accordance with ASTM D4186.
2. Value of Specific gravity Gs is assumed
(*) Reported final data are taken at maximum deformation

Test Remarks:
Sample description: Silty CLAY, trace fine sand



Exploration No:	CDM-5	**Preconsolidation Pressure (psf):**	4,800
Sample No:	U-1	**Estimated In Situ Pressure (psf):**	1,621
Depth (ft):	20	**Compression Ratio, CR:**	0.129
Sample Description:	Lean Clay - CL	**Recompression Ratio, RR:**	0.034

CDM Smith
Geotechnical Engineering Laboratory

Client: City of Cambridge
Project: King Open School
Project No: 00139-107911

CONSTANT RATE OF STRAIN CONSOLIDATION TEST
ASTM D4186

Appendix E

Drum Disposal Manifest

THE ENVIRONMENTAL QUALITY COMPANY®

EQ Northeast, Inc.
185 Industrial Road
Wrentham, MA 02093

Emergency Response #:
Phone: (508) 384-6151
Fax: (508) 384-6026

Work Order: 6605000
Reference Code:
Arrival Time:
Date: 03/25/2015
Prepared By: Michelle Nowak

BILLING INFORMATION

Name: CDM CONSTRUCTORS
Acct. #: 10514-28
Phone: (978) 250-6727
Addr: 25 INDUSTRIAL AVENUE
CHELMSFORD, MA 01824

Contact:
Title:
Phone:
Mobile: ( ) -
PO / Rel:

GENERATOR INFORMATION

Name: MARTIN LUTHER KING JR. SCI
EPA #: MP6173494251 (ID: 128743)
Phone: (617) 349-4251
Addr: 100 PUTNAM AVENUE
CAMBRIDGE, MA 02139

Contact:
Title:
Phone: ( ) -
Mobile: ( ) -

TSDF INFORMATION

TSDF: NORTHLAND ENVIRONMENTAL, INC.
Addr: 275 ALLENS AVENUE
PROVIDENCE,RI 02905

TSDF Contact: DAN ZIOBRO/CORI

EPA #: RID040098352
Phone: (401) 781-6340
Fax: (401) 781-9710

Manifest: 013575879JJK
TSDF Contact: DAN ZIOBRO/CORI

TSDF: NORTHLAND ENVIRONMENTAL, INC.
Addr: 275 ALLENS AVENUE
PROVIDENCE,RI 02905

EPA #: RID040098352
Phone: (401) 781-6340
Fax: (401) 781-9710

HM DESCRIPTION	# OF CONT.	TYPE	QUANTITY	UNIT
1. STATE REGULATED OILY MATERIAL Approval Code: LF01EONE-00 (69424) Waste Codes: MA01 R015 Hand. Instruct: (WO# 6605000)	1	DM	40	P

EQUIPMENT ACKNOWLEDGMENT

Customer acknowledges that this equipment is suitable for the transportation, storage or other service to be provided.

Tractor # 409 Trailer #_____ Tanker #_____ Roll-Off Box #_____ w/ liner?_____ Spotted #_____ Picked_up # _____ Vac Fee _________

Driver Signature ______ Date ______ Customer Signature ______ Date ______

Pickup	Date	Time	Explanation
Arrive at Shipper:	4/10	1000	
Start Loading:			P/U
Finish Loading:			
Leave Site:		1045	

SHIPMENT RECEIVED IN APPARENT GOOD ORDER (CONTENTS UNKNOWN) SUBJECT TO THE TERMS AND CONDITIONS OF THE UNIFORM STRAIGHT BILL OF LADING AND ANY GOVERNING CLASSFICATIONS AND TARIFFS LAWFULLY ON FILE ON THE DATE OF SHIPMENT.

THIS IS TO CERTIFY THAT THE ABOVE NAMED MATERIALS ARE PROPERLY CLASSIFIED, DESCRIBED, PACKAGED, MARKED AND LABELED AND ARE IN PROPER CONDITION FOR TRANSPORTATION ACCORDING TO THE APPLICABLE REGULATIONS OF THE DEPARTMENT OF TRANSPORTATION.

Red Mcwell [signature] 4/10 x [signature] 4/10

Driver Signature | Date | Customer Signature | Date

Delivery	Date	Time	Explanation
Arrive at TSDF:			
Start Unloading:			
Finish Unloading:			
Leave Site:			

Driver Signature ______ Date ______ Receiver Signature ______ Date ______

Please comment on the job so we can continue to provide better service: ☐ Excellent ☐ Satisfactory ☐ Poor

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Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: MP6 173 494 251
2. Page 1 of: 1
3. Emergency Response Phone: (800) 535-5053
4. Manifest Tracking Number: 013575879 JJK

5. Generator's Name and Mailing Address: CITY OF CAMBRIDGE
ATTN: MICHAEL BLACK
795 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139

Generator's Site Address (if different than mailing address):
MARTIN LUTHER KING JR. SCHOOL
100 PUTNAM AVENUE
CAMBRIDGE, MA 02139

Generator's Phone: (617) 349-4251

6. Transporter 1 Company Name: EQ NORTHEAST, INC. — U.S. EPA ID Number: MAD 084 814 136

7. Transporter 2 Company Name: — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: NORTHLAND ENVIRONMENTAL, INC.
275 ALLENS AVENUE
PROVIDENCE, RI 02905
Facility's Phone: (401) 781-6340
U.S. EPA ID Number: RID 040 098 352

GENERATOR

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes	
	1. STATE REGULATED OILY MATERIAL	001	DM	~~450~~ 410	P	MA01	R015
	2.						
	3.						
	4.						

14. Special Handling Instructions and Additional Information
1. LF01EQNE-00 / (S) 1 DRUM; PETROLEUM CONTAMINATED SOIL / (WO# 6605000)

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Brandon Roy — Signature: [signature] — Month 04 Day 10 Year 15

INT'L
16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER
17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Robert McAllister — Signature: Robert McAllister — Month 04 Day 10 Year 15
Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY
18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:
18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name — Signature — Month Day Year

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

GENERATOR'S INITIAL COPY

Appendix F

Soil and Groundwater Analytical Laboratory Data

ANALYTICAL REPORT

Lab Number:	L1503576
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Jay McMullen
Phone:	(617) 452-6303
Project Name:	KING OPEN SCHOOL
Project Number:	0139-107911
Report Date:	03/02/15

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

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

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1503576-01	CDM-1 1'-5'	SOIL	CAMBRIDGE, MA	02/25/15 10:45	02/25/15
L1503576-02	CDM-1 5'-9'	SOIL	CAMBRIDGE, MA	02/25/15 11:00	02/25/15

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503576
Project Number:	0139-107911	**Report Date:**	03/02/15

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).	YES
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)?	NO

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.

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. All specific QC 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. 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 (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar 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. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576
Project Number: 0139-107911 **Report Date:** 03/02/15

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Metals.

Volatile Organics

In reference to question H:

The initial calibration, associated with L1503576-01 and -02, did not meet the method required minimum response factor on the lowest calibration standard for 4-methyl-2-pentanone (0.05631) and 1,4-dioxane (0.00244), as well as the average response factor for 2-butanone, 4-methyl-2-pentanone, and 1,4-dioxane.
The initial calibration verification is outside acceptance criteria for dichlorodifluoromethane (144%), but within overall method criteria.
The continuing calibration standard, associated with L1503576-01 and -02, is outside the acceptance criteria for several compounds; however, it is within overall method allowances. A copy of the continuing calibration standard is included as an addendum to this report.

EPH

In reference to question I:

All samples were analyzed for a subset of MCP compounds per the Chain of Custody.

Metals

In reference to question H:

The WG764910-3 LCSD recovery, associated with L1503576-01 and -02, is outside the acceptance criteria for chromium (78%). Re-analysis of the LCSD yielded an unacceptable recovery of 76%. The LCS recovery was within acceptance criteria for this analyte; therefore, no further action was taken.

In reference to question I:

All samples were analyzed for a subset of MCP elements per the Chain of Custody.

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: 03/02/15

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ORGANICS

VOLATILES

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576

Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID:	L1503576-01	Date Collected:	02/25/15 10:45
Client ID:	CDM-1 1'-5'	Date Received:	02/25/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Analytical Method:	97,8260C		
Analytical Date:	02/27/15 10:45		
Analyst:	MV		
Percent Solids:	84%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	20	--	1
1,1-Dichloroethane	ND		ug/kg	3.1	--	1
Chloroform	ND		ug/kg	3.1	--	1
Carbon tetrachloride	ND		ug/kg	2.0	--	1
1,2-Dichloropropane	ND		ug/kg	7.2	--	1
Dibromochloromethane	ND		ug/kg	2.0	--	1
1,1,2-Trichloroethane	ND		ug/kg	3.1	--	1
Tetrachloroethene	ND		ug/kg	2.0	--	1
Chlorobenzene	ND		ug/kg	2.0	--	1
Trichlorofluoromethane	ND		ug/kg	8.2	--	1
1,2-Dichloroethane	ND		ug/kg	2.0	--	1
1,1,1-Trichloroethane	ND		ug/kg	2.0	--	1
Bromodichloromethane	ND		ug/kg	2.0	--	1
trans-1,3-Dichloropropene	ND		ug/kg	2.0	--	1
cis-1,3-Dichloropropene	ND		ug/kg	2.0	--	1
1,3-Dichloropropene, Total	ND		ug/kg	2.0	--	1
1,1-Dichloropropene	ND		ug/kg	8.2	--	1
Bromoform	ND		ug/kg	8.2	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	2.0	--	1
Benzene	ND		ug/kg	2.0	--	1
Toluene	ND		ug/kg	3.1	--	1
Ethylbenzene	ND		ug/kg	2.0	--	1
Chloromethane	ND		ug/kg	8.2	--	1
Bromomethane	ND		ug/kg	4.1	--	1
Vinyl chloride	ND		ug/kg	4.1	--	1
Chloroethane	ND		ug/kg	4.1	--	1
1,1-Dichloroethene	ND		ug/kg	2.0	--	1
trans-1,2-Dichloroethene	ND		ug/kg	3.1	--	1
Trichloroethene	ND		ug/kg	2.0	--	1
1,2-Dichlorobenzene	ND		ug/kg	8.2	--	1

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503576

Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID: L1503576-01 Date Collected: 02/25/15 10:45
Client ID: CDM-1 1'-5' Date Received: 02/25/15
Sample Location: CAMBRIDGE, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	8.2	--	1
1,4-Dichlorobenzene	ND		ug/kg	8.2	--	1
Methyl tert butyl ether	ND		ug/kg	4.1	--	1
p/m-Xylene	ND		ug/kg	4.1	--	1
o-Xylene	ND		ug/kg	4.1	--	1
Xylenes, Total	ND		ug/kg	4.1	--	1
cis-1,2-Dichloroethene	ND		ug/kg	2.0	--	1
1,2-Dichloroethene, Total	ND		ug/kg	2.0	--	1
Dibromomethane	ND		ug/kg	8.2	--	1
1,2,3-Trichloropropane	ND		ug/kg	8.2	--	1
Styrene	ND		ug/kg	4.1	--	1
Dichlorodifluoromethane	ND		ug/kg	20	--	1
Acetone	ND		ug/kg	74	--	1
Carbon disulfide	ND		ug/kg	8.2	--	1
Methyl ethyl ketone	ND		ug/kg	20	--	1
Methyl isobutyl ketone	ND		ug/kg	20	--	1
2-Hexanone	ND		ug/kg	20	--	1
Bromochloromethane	ND		ug/kg	8.2	--	1
Tetrahydrofuran	ND		ug/kg	8.2	--	1
2,2-Dichloropropane	ND		ug/kg	10	--	1
1,2-Dibromoethane	ND		ug/kg	8.2	--	1
1,3-Dichloropropane	ND		ug/kg	8.2	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	2.0	--	1
Bromobenzene	ND		ug/kg	10	--	1
n-Butylbenzene	ND		ug/kg	2.0	--	1
sec-Butylbenzene	ND		ug/kg	2.0	--	1
tert-Butylbenzene	ND		ug/kg	8.2	--	1
o-Chlorotoluene	ND		ug/kg	8.2	--	1
p-Chlorotoluene	ND		ug/kg	8.2	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	8.2	--	1
Hexachlorobutadiene	ND		ug/kg	8.2	--	1
Isopropylbenzene	ND		ug/kg	2.0	--	1
p-Isopropyltoluene	ND		ug/kg	2.0	--	1
Naphthalene	ND		ug/kg	8.2	--	1
n-Propylbenzene	ND		ug/kg	2.0	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	8.2	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	8.2	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	8.2	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	8.2	--	1

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503576

Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID:	L1503576-01	Date Collected:	02/25/15 10:45
Client ID:	CDM-1 1'-5'	Date Received:	02/25/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	10	--	1
Diisopropyl Ether	ND		ug/kg	8.2	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	8.2	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	8.2	--	1
1,4-Dioxane	ND		ug/kg	82	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
Toluene-d8	104		70-130
4-Bromofluorobenzene	120		70-130
Dibromofluoromethane	105		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576

Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID: L1503576-02
Client ID: CDM-1 5'-9'
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 02/27/15 11:38
Analyst: MV
Percent Solids: 85%

Date Collected: 02/25/15 11:00
Date Received: 02/25/15
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	5.8	--	1
1,1-Dichloroethane	ND		ug/kg	0.87	--	1
Chloroform	ND		ug/kg	0.87	--	1
Carbon tetrachloride	ND		ug/kg	0.58	--	1
1,2-Dichloropropane	ND		ug/kg	2.0	--	1
Dibromochloromethane	ND		ug/kg	0.58	--	1
1,1,2-Trichloroethane	ND		ug/kg	0.87	--	1
Tetrachloroethene	ND		ug/kg	0.58	--	1
Chlorobenzene	ND		ug/kg	0.58	--	1
Trichlorofluoromethane	ND		ug/kg	2.3	--	1
1,2-Dichloroethane	ND		ug/kg	0.58	--	1
1,1,1-Trichloroethane	ND		ug/kg	0.58	--	1
Bromodichloromethane	ND		ug/kg	0.58	--	1
trans-1,3-Dichloropropene	ND		ug/kg	0.58	--	1
cis-1,3-Dichloropropene	ND		ug/kg	0.58	--	1
1,3-Dichloropropene, Total	ND		ug/kg	0.58	--	1
1,1-Dichloropropene	ND		ug/kg	2.3	--	1
Bromoform	ND		ug/kg	2.3	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.58	--	1
Benzene	ND		ug/kg	0.58	--	1
Toluene	ND		ug/kg	0.87	--	1
Ethylbenzene	ND		ug/kg	0.58	--	1
Chloromethane	ND		ug/kg	2.3	--	1
Bromomethane	ND		ug/kg	1.2	--	1
Vinyl chloride	ND		ug/kg	1.2	--	1
Chloroethane	ND		ug/kg	1.2	--	1
1,1-Dichloroethene	ND		ug/kg	0.58	--	1
trans-1,2-Dichloroethene	ND		ug/kg	0.87	--	1
Trichloroethene	ND		ug/kg	0.58	--	1
1,2-Dichlorobenzene	ND		ug/kg	2.3	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576

Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID: L1503576-02 Date Collected: 02/25/15 11:00
Client ID: CDM-1 5'-9' Date Received: 02/25/15
Sample Location: CAMBRIDGE, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	2.3	--	1
1,4-Dichlorobenzene	ND		ug/kg	2.3	--	1
Methyl tert butyl ether	ND		ug/kg	1.2	--	1
p/m-Xylene	ND		ug/kg	1.2	--	1
o-Xylene	ND		ug/kg	1.2	--	1
Xylenes, Total	ND		ug/kg	1.2	--	1
cis-1,2-Dichloroethene	ND		ug/kg	0.58	--	1
1,2-Dichloroethene, Total	ND		ug/kg	0.58	--	1
Dibromomethane	ND		ug/kg	2.3	--	1
1,2,3-Trichloropropane	ND		ug/kg	2.3	--	1
Styrene	ND		ug/kg	1.2	--	1
Dichlorodifluoromethane	ND		ug/kg	5.8	--	1
Acetone	ND		ug/kg	21	--	1
Carbon disulfide	ND		ug/kg	2.3	--	1
Methyl ethyl ketone	ND		ug/kg	5.8	--	1
Methyl isobutyl ketone	ND		ug/kg	5.8	--	1
2-Hexanone	ND		ug/kg	5.8	--	1
Bromochloromethane	ND		ug/kg	2.3	--	1
Tetrahydrofuran	ND		ug/kg	2.3	--	1
2,2-Dichloropropane	ND		ug/kg	2.9	--	1
1,2-Dibromoethane	ND		ug/kg	2.3	--	1
1,3-Dichloropropane	ND		ug/kg	2.3	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.58	--	1
Bromobenzene	ND		ug/kg	2.9	--	1
n-Butylbenzene	ND		ug/kg	0.58	--	1
sec-Butylbenzene	ND		ug/kg	0.58	--	1
tert-Butylbenzene	ND		ug/kg	2.3	--	1
o-Chlorotoluene	ND		ug/kg	2.3	--	1
p-Chlorotoluene	ND		ug/kg	2.3	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	2.3	--	1
Hexachlorobutadiene	ND		ug/kg	2.3	--	1
Isopropylbenzene	ND		ug/kg	0.58	--	1
p-Isopropyltoluene	ND		ug/kg	0.58	--	1
Naphthalene	ND		ug/kg	2.3	--	1
n-Propylbenzene	ND		ug/kg	0.58	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	2.3	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	2.3	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	2.3	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	2.3	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576

Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID:	L1503576-02	Date Collected:	02/25/15 11:00
Client ID:	CDM-1 5'-9'	Date Received:	02/25/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	2.9	--	1
Diisopropyl Ether	ND		ug/kg	2.3	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.3	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.3	--	1
1,4-Dioxane	ND		ug/kg	23	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	108		70-130
Dibromofluoromethane	101		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576
Project Number: 0139-107911 **Report Date:** 03/02/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/27/15 09:26
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG765450-3					
Methylene chloride	ND		ug/kg	10	--
1,1-Dichloroethane	ND		ug/kg	1.5	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	3.5	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.5	--
Tetrachloroethene	ND		ug/kg	1.0	--
Chlorobenzene	ND		ug/kg	1.0	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	1.0	--
Bromodichloromethane	ND		ug/kg	1.0	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	1.0	--
1,3-Dichloropropene, Total	ND		ug/kg	1.0	--
1,1-Dichloropropene	ND		ug/kg	4.0	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	--
Benzene	ND		ug/kg	1.0	--
Toluene	ND		ug/kg	1.5	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	2.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	1.0	--

Project Name: KING OPEN SCHOOL
Lab Number: L1503576
Project Number: 0139-107911
Report Date: 03/02/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/27/15 09:26
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG765450-3					
1,2-Dichlorobenzene	ND		ug/kg	4.0	--
1,3-Dichlorobenzene	ND		ug/kg	4.0	--
1,4-Dichlorobenzene	ND		ug/kg	4.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	2.0	--
Xylenes, Total	ND		ug/kg	2.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	4.0	--
1,2,3-Trichloropropane	ND		ug/kg	4.0	--
Styrene	ND		ug/kg	2.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	36	--
Carbon disulfide	ND		ug/kg	4.0	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	4.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	5.0	--
1,2-Dibromoethane	ND		ug/kg	4.0	--
1,3-Dichloropropane	ND		ug/kg	4.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	--
Bromobenzene	ND		ug/kg	5.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	4.0	--
o-Chlorotoluene	ND		ug/kg	4.0	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576
Project Number: 0139-107911 **Report Date:** 03/02/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/27/15 09:26
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG765450-3					
p-Chlorotoluene	ND		ug/kg	4.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	4.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	4.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	4.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	4.0	--
Diethyl ether	ND		ug/kg	5.0	--
Diisopropyl Ether	ND		ug/kg	4.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	4.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	4.0	--
1,4-Dioxane	ND		ug/kg	40	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	100		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503576
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG765450-1 WG765450-2								
Methylene chloride	101		100		70-130	1		20
1,1-Dichloroethane	106		100		70-130	6		20
Chloroform	110		106		70-130	4		20
Carbon tetrachloride	115		106		70-130	8		20
1,2-Dichloropropane	113		107		70-130	5		20
Dibromochloromethane	110		108		70-130	2		20
1,1,2-Trichloroethane	109		106		70-130	3		20
Tetrachloroethene	118		112		70-130	5		20
Chlorobenzene	114		110		70-130	4		20
Trichlorofluoromethane	109		99		70-130	10		20
1,2-Dichloroethane	108		102		70-130	6		20
1,1,1-Trichloroethane	112		105		70-130	6		20
Bromodichloromethane	115		109		70-130	5		20
trans-1,3-Dichloropropene	111		106		70-130	5		20
cis-1,3-Dichloropropene	112		108		70-130	4		20
1,1-Dichloropropene	114		105		70-130	8		20
Bromoform	108		105		70-130	3		20
1,1,2,2-Tetrachloroethane	108		103		70-130	5		20
Benzene	108		103		70-130	5		20
Toluene	111		106		70-130	5		20
Ethylbenzene	120		115		70-130	4		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG765450-1 WG765450-2								
Chloromethane	91		85		70-130	7		20
Bromomethane	89		86		70-130	3		20
Vinyl chloride	97		91		70-130	6		20
Chloroethane	110		101		70-130	9		20
1,1-Dichloroethene	92		93		70-130	1		20
trans-1,2-Dichloroethene	104		96		70-130	8		20
Trichloroethene	115		108		70-130	6		20
1,2-Dichlorobenzene	113		110		70-130	3		20
1,3-Dichlorobenzene	118		113		70-130	4		20
1,4-Dichlorobenzene	113		110		70-130	3		20
Methyl tert butyl ether	100		95		70-130	5		20
p/m-Xylene	121		116		70-130	4		20
o-Xylene	119		114		70-130	4		20
cis-1,2-Dichloroethene	108		103		70-130	5		20
Dibromomethane	104		99		70-130	5		20
1,2,3-Trichloropropane	108		103		70-130	5		20
Styrene	118		113		70-130	4		20
Dichlorodifluoromethane	85		79		70-130	7		20
Acetone	130		109		70-130	18		20
Carbon disulfide	92		89		70-130	3		20
Methyl ethyl ketone	111		96		70-130	14		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG765450-1 WG765450-2								
Methyl isobutyl ketone	112		103		70-130	8		20
2-Hexanone	110		100		70-130	10		20
Bromochloromethane	104		98		70-130	6		20
Tetrahydrofuran	108		98		70-130	10		20
2,2-Dichloropropane	109		103		70-130	6		20
1,2-Dibromoethane	106		100		70-130	6		20
1,3-Dichloropropane	109		105		70-130	4		20
1,1,1,2-Tetrachloroethane	114		111		70-130	3		20
Bromobenzene	110		108		70-130	2		20
n-Butylbenzene	**132**	Q	126		70-130	5		20
sec-Butylbenzene	124		118		70-130	5		20
tert-Butylbenzene	120		116		70-130	3		20
o-Chlorotoluene	117		112		70-130	4		20
p-Chlorotoluene	119		116		70-130	3		20
1,2-Dibromo-3-chloropropane	100		93		70-130	7		20
Hexachlorobutadiene	120		115		70-130	4		20
Isopropylbenzene	120		117		70-130	3		20
p-Isopropyltoluene	125		119		70-130	5		20
Naphthalene	102		96		70-130	6		20
n-Propylbenzene	125		120		70-130	4		20
1,2,3-Trichlorobenzene	110		108		70-130	2		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503576
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG765450-1 WG765450-2								
1,2,4-Trichlorobenzene	118		112		70-130	5		20
1,3,5-Trimethylbenzene	122		116		70-130	5		20
1,2,4-Trimethylbenzene	121		116		70-130	4		20
Diethyl ether	105		99		70-130	6		20
Diisopropyl Ether	112		107		70-130	5		20
Ethyl-Tert-Butyl-Ether	106		102		70-130	4		20
Tertiary-Amyl Methyl Ether	105		100		70-130	5		20
1,4-Dioxane	98		89		70-130	10		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	100		97		70-130
Toluene-d8	100		101		70-130
4-Bromofluorobenzene	102		104		70-130
Dibromofluoromethane	102		101		70-130

SEMIVOLATILES

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576

Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID:	L1503576-01	Date Collected:	02/25/15 10:45
Client ID:	CDM-1 1'-5'	Date Received:	02/25/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/26/15 04:13
Analytical Date:	02/26/15 13:19		
Analyst:	RC		
Percent Solids:	84%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	160	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	200	--	1
Hexachlorobenzene	ND		ug/kg	120	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	180	--	1
2-Chloronaphthalene	ND		ug/kg	200	--	1
1,2-Dichlorobenzene	ND		ug/kg	200	--	1
1,3-Dichlorobenzene	ND		ug/kg	200	--	1
1,4-Dichlorobenzene	ND		ug/kg	200	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	200	--	1
2,4-Dinitrotoluene	ND		ug/kg	200	--	1
2,6-Dinitrotoluene	ND		ug/kg	200	--	1
Azobenzene	ND		ug/kg	200	--	1
Fluoranthene	ND		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	200	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	240	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	--	1
Hexachlorobutadiene	ND		ug/kg	200	--	1
Hexachloroethane	ND		ug/kg	160	--	1
Isophorone	ND		ug/kg	180	--	1
Naphthalene	ND		ug/kg	200	--	1
Nitrobenzene	ND		ug/kg	180	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	200	--	1
Butyl benzyl phthalate	ND		ug/kg	200	--	1
Di-n-butylphthalate	ND		ug/kg	200	--	1
Di-n-octylphthalate	ND		ug/kg	200	--	1
Diethyl phthalate	ND		ug/kg	200	--	1
Dimethyl phthalate	ND		ug/kg	200	--	1
Benzo(a)anthracene	ND		ug/kg	120	--	1
Benzo(a)pyrene	ND		ug/kg	160	--	1
Benzo(b)fluoranthene	ND		ug/kg	120	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576
Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID:	L1503576-01	Date Collected:	02/25/15 10:45
Client ID:	CDM-1 1'-5'	Date Received:	02/25/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	ND		ug/kg	120	--	1
Chrysene	ND		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	160	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	ND		ug/kg	160	--	1
Fluorene	ND		ug/kg	200	--	1
Phenanthrene	ND		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	120	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	160	--	1
Pyrene	ND		ug/kg	120	--	1
Aniline	ND		ug/kg	240	--	1
4-Chloroaniline	ND		ug/kg	200	--	1
Dibenzofuran	ND		ug/kg	200	--	1
2-Methylnaphthalene	ND		ug/kg	240	--	1
Acetophenone	ND		ug/kg	200	--	1
2,4,6-Trichlorophenol	ND		ug/kg	120	--	1
2-Chlorophenol	ND		ug/kg	200	--	1
2,4-Dichlorophenol	ND		ug/kg	180	--	1
2,4-Dimethylphenol	ND		ug/kg	200	--	1
2-Nitrophenol	ND		ug/kg	420	--	1
4-Nitrophenol	ND		ug/kg	280	--	1
2,4-Dinitrophenol	ND		ug/kg	940	--	1
Pentachlorophenol	ND		ug/kg	390	--	1
Phenol	ND		ug/kg	200	--	1
2-Methylphenol	ND		ug/kg	200	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	280	--	1
2,4,5-Trichlorophenol	ND		ug/kg	200	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	74		30-130
Phenol-d6	82		30-130
Nitrobenzene-d5	82		30-130
2-Fluorobiphenyl	82		30-130
2,4,6-Tribromophenol	98		30-130
4-Terphenyl-d14	80		30-130

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503576

Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID:	L1503576-02	Date Collected:	02/25/15 11:00
Client ID:	CDM-1 5'-9'	Date Received:	02/25/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/26/15 04:13
Analytical Date:	02/26/15 13:45		
Analyst:	RC		
Percent Solids:	85%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	--	1
Hexachlorobenzene	ND		ug/kg	120	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	--	1
2-Chloronaphthalene	ND		ug/kg	190	--	1
1,2-Dichlorobenzene	ND		ug/kg	190	--	1
1,3-Dichlorobenzene	ND		ug/kg	190	--	1
1,4-Dichlorobenzene	ND		ug/kg	190	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	--	1
2,4-Dinitrotoluene	ND		ug/kg	190	--	1
2,6-Dinitrotoluene	ND		ug/kg	190	--	1
Azobenzene	ND		ug/kg	190	--	1
Fluoranthene	ND		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	--	1
Hexachlorobutadiene	ND		ug/kg	190	--	1
Hexachloroethane	ND		ug/kg	150	--	1
Isophorone	ND		ug/kg	170	--	1
Naphthalene	ND		ug/kg	190	--	1
Nitrobenzene	ND		ug/kg	170	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	190	--	1
Butyl benzyl phthalate	ND		ug/kg	190	--	1
Di-n-butylphthalate	ND		ug/kg	190	--	1
Di-n-octylphthalate	ND		ug/kg	190	--	1
Diethyl phthalate	ND		ug/kg	190	--	1
Dimethyl phthalate	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	120	--	1
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	120	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576
Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID:	L1503576-02	Date Collected:	02/25/15 11:00
Client ID:	CDM-1 5'-9'	Date Received:	02/25/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	ND		ug/kg	120	--	1
Chrysene	ND		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	120	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	150	--	1
Pyrene	ND		ug/kg	120	--	1
Aniline	ND		ug/kg	230	--	1
4-Chloroaniline	ND		ug/kg	190	--	1
Dibenzofuran	ND		ug/kg	190	--	1
2-Methylnaphthalene	ND		ug/kg	230	--	1
Acetophenone	ND		ug/kg	190	--	1
2,4,6-Trichlorophenol	ND		ug/kg	120	--	1
2-Chlorophenol	ND		ug/kg	190	--	1
2,4-Dichlorophenol	ND		ug/kg	170	--	1
2,4-Dimethylphenol	ND		ug/kg	190	--	1
2-Nitrophenol	ND		ug/kg	420	--	1
4-Nitrophenol	ND		ug/kg	270	--	1
2,4-Dinitrophenol	ND		ug/kg	920	--	1
Pentachlorophenol	ND		ug/kg	380	--	1
Phenol	ND		ug/kg	190	--	1
2-Methylphenol	ND		ug/kg	190	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	280	--	1
2,4,5-Trichlorophenol	ND		ug/kg	190	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	88		30-130
Phenol-d6	93		30-130
Nitrobenzene-d5	93		30-130
2-Fluorobiphenyl	93		30-130
2,4,6-Tribromophenol	116		30-130
4-Terphenyl-d14	86		30-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576
Project Number: 0139-107911 **Report Date:** 03/02/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/26/15 11:11
Analyst: RC

Extraction Method: EPA 3546
Extraction Date: 02/26/15 04:13

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG764897-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	98	--
Bis(2-chloroethyl)ether	ND		ug/kg	150	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	160	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	160	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	98	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	130	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/26/15 11:11
Analyst: RC

Extraction Method: EPA 3546
Extraction Date: 02/26/15 04:13

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG764897-1					
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	98	--
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	200	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	98	--
2-Chlorophenol	ND		ug/kg	160	--
2,4-Dichlorophenol	ND		ug/kg	150	--
2,4-Dimethylphenol	ND		ug/kg	160	--
2-Nitrophenol	ND		ug/kg	350	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	780	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/26/15 11:11
Analyst: RC

Extraction Method: EPA 3546
Extraction Date: 02/26/15 04:13

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG764897-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	77		30-130
Phenol-d6	81		30-130
Nitrobenzene-d5	82		30-130
2-Fluorobiphenyl	79		30-130
2,4,6-Tribromophenol	94		30-130
4-Terphenyl-d14	86		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG764897-2 WG764897-3								
Acenaphthene	90		88		40-140	2		30
1,2,4-Trichlorobenzene	78		80		40-140	3		30
Hexachlorobenzene	96		91		40-140	5		30
Bis(2-chloroethyl)ether	72		75		40-140	4		30
2-Chloronaphthalene	88		87		40-140	1		30
1,2-Dichlorobenzene	70		76		40-140	8		30
1,3-Dichlorobenzene	66		74		40-140	11		30
1,4-Dichlorobenzene	70		74		40-140	6		30
3,3'-Dichlorobenzidine	67		75		40-140	11		30
2,4-Dinitrotoluene	98		92		40-140	6		30
2,6-Dinitrotoluene	95		89		40-140	7		30
Azobenzene	97		92		40-140	5		30
Fluoranthene	96		90		40-140	6		30
4-Bromophenyl phenyl ether	98		94		40-140	4		30
Bis(2-chloroisopropyl)ether	74		76		40-140	3		30
Bis(2-chloroethoxy)methane	81		83		40-140	2		30
Hexachlorobutadiene	75		80		40-140	6		30
Hexachloroethane	74		79		40-140	7		30
Isophorone	87		87		40-140	0		30
Naphthalene	76		81		40-140	6		30
Nitrobenzene	81		84		40-140	4		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG764897-2 WG764897-3								
Bis(2-Ethylhexyl)phthalate	105		99		40-140	6		30
Butyl benzyl phthalate	100		98		40-140	2		30
Di-n-butylphthalate	99		95		40-140	4		30
Di-n-octylphthalate	110		105		40-140	5		30
Diethyl phthalate	98		92		40-140	6		30
Dimethyl phthalate	95		90		40-140	5		30
Benzo(a)anthracene	99		94		40-140	5		30
Benzo(a)pyrene	102		97		40-140	5		30
Benzo(b)fluoranthene	102		96		40-140	6		30
Benzo(k)fluoranthene	103		99		40-140	4		30
Chrysene	95		90		40-140	5		30
Acenaphthylene	91		88		40-140	3		30
Anthracene	99		94		40-140	5		30
Benzo(ghi)perylene	95		91		40-140	4		30
Fluorene	96		91		40-140	5		30
Phenanthrene	95		90		40-140	5		30
Dibenzo(a,h)anthracene	97		91		40-140	6		30
Indeno(1,2,3-cd)Pyrene	100		96		40-140	4		30
Pyrene	94		91		40-140	3		30
Aniline	40		50		40-140	22		30
4-Chloroaniline	66		70		40-140	6		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG764897-2 WG764897-3								
Dibenzofuran	93		90		40-140	3		30
2-Methylnaphthalene	82		82		40-140	0		30
Acetophenone	82		86		40-140	5		30
2,4,6-Trichlorophenol	99		96		30-130	3		30
2-Chlorophenol	77		83		30-130	8		30
2,4-Dichlorophenol	94		96		30-130	2		30
2,4-Dimethylphenol	97		94		30-130	3		30
2-Nitrophenol	82		86		30-130	5		30
4-Nitrophenol	**132**	Q	128		30-130	3		30
2,4-Dinitrophenol	69		52		30-130	28		30
Pentachlorophenol	111		107		30-130	4		30
Phenol	78		80		30-130	3		30
2-Methylphenol	84		86		30-130	2		30
3-Methylphenol/4-Methylphenol	92		91		30-130	1		30
2,4,5-Trichlorophenol	102		97		30-130	5		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1503576
Project Number: 0139-107911
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG764897-2 WG764897-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	76		82		30-130
Phenol-d6	84		88		30-130
Nitrobenzene-d5	84		85		30-130
2-Fluorobiphenyl	87		86		30-130
2,4,6-Tribromophenol	104		99		30-130
4-Terphenyl-d14	88		86		30-130

PETROLEUM HYDROCARBONS

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576

Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID:	L1503576-01	Date Collected:	02/25/15 10:45
Client ID:	CDM-1 1'-5'	Date Received:	02/25/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/26/15 01:41
Analytical Date:	02/27/15 04:32	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/26/15
Percent Solids:	84%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.70	--	1
C19-C36 Aliphatics	ND		mg/kg	7.70	--	1
C11-C22 Aromatics	ND		mg/kg	7.70	--	1
C11-C22 Aromatics, Adjusted	ND		mg/kg	7.70	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	62		40-140
o-Terphenyl	66		40-140
2-Fluorobiphenyl	66		40-140
2-Bromonaphthalene	67		40-140

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576
Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID:	L1503576-02	Date Collected:	02/25/15 11:00
Client ID:	CDM-1 5'-9'	Date Received:	02/25/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/26/15 01:41
Analytical Date:	02/27/15 05:17	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/26/15
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.69	--	1
C19-C36 Aliphatics	ND		mg/kg	7.69	--	1
C11-C22 Aromatics	ND		mg/kg	7.69	--	1
C11-C22 Aromatics, Adjusted	ND		mg/kg	7.69	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	65		40-140
o-Terphenyl	65		40-140
2-Fluorobiphenyl	68		40-140
2-Bromonaphthalene	69		40-140

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 02/27/15 02:17
Analyst: SR

Extraction Method: EPA 3546
Extraction Date: 02/26/15 01:41
Cleanup Method: EPH-04-1
Cleanup Date: 02/26/15

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG764893-1					
C9-C18 Aliphatics	ND		mg/kg	6.59	--
C19-C36 Aliphatics	ND		mg/kg	6.59	--
C11-C22 Aromatics	ND		mg/kg	6.59	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.59	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	69		40-140
o-Terphenyl	71		40-140
2-Fluorobiphenyl	74		40-140
2-Bromonaphthalene	75		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG764893-2 WG764893-3								
C9-C18 Aliphatics	63		52		40-140	19		25
C19-C36 Aliphatics	85		70		40-140	19		25
C11-C22 Aromatics	79		62		40-140	24		25
Naphthalene	68		55		40-140	21		25
2-Methylnaphthalene	74		59		40-140	23		25
Acenaphthylene	65		51		40-140	24		25
Acenaphthene	74		59		40-140	23		25
Fluorene	78		61		40-140	24		25
Phenanthrene	80		62		40-140	25		25
Anthracene	83		64		40-140	**26**	Q	25
Fluoranthene	84		64		40-140	**27**	Q	25
Pyrene	85		65		40-140	**27**	Q	25
Benzo(a)anthracene	82		63		40-140	**26**	Q	25
Chrysene	89		68		40-140	**27**	Q	25
Benzo(b)fluoranthene	88		69		40-140	24		25
Benzo(k)fluoranthene	85		62		40-140	**31**	Q	25
Benzo(a)pyrene	81		61		40-140	**28**	Q	25
Indeno(1,2,3-cd)Pyrene	72		52		40-140	**32**	Q	25
Dibenzo(a,h)anthracene	81		60		40-140	**30**	Q	25
Benzo(ghi)perylene	85		62		40-140	**31**	Q	25
Nonane (C9)	56		47		30-140	17		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503576
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG764893-2 WG764893-3								
Decane (C10)	64		53		40-140	19		25
Dodecane (C12)	68		56		40-140	19		25
Tetradecane (C14)	70		59		40-140	17		25
Hexadecane (C16)	76		62		40-140	20		25
Octadecane (C18)	82		66		40-140	22		25
Nonadecane (C19)	84		68		40-140	21		25
Eicosane (C20)	84		68		40-140	21		25
Docosane (C22)	86		70		40-140	21		25
Tetracosane (C24)	83		67		40-140	21		25
Hexacosane (C26)	87		71		40-140	20		25
Octacosane (C28)	87		70		40-140	22		25
Triacontane (C30)	88		72		40-140	20		25
Hexatriacontane (C36)	89		72		40-140	21		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	76		59		40-140
o-Terphenyl	77		60		40-140
2-Fluorobiphenyl	76		64		40-140
2-Bromonaphthalene	78		65		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

PCBS

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576

Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID:	L1503576-01	Date Collected:	02/25/15 10:45
Client ID:	CDM-1 1'-5'	Date Received:	02/25/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/26/15 00:13
Analytical Date:	02/26/15 16:40	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	02/26/15
Percent Solids:	84%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/26/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	39.0	--	1	A
Aroclor 1221	ND		ug/kg	39.0	--	1	A
Aroclor 1232	ND		ug/kg	39.0	--	1	A
Aroclor 1242	ND		ug/kg	39.0	--	1	A
Aroclor 1248	ND		ug/kg	39.0	--	1	A
Aroclor 1254	ND		ug/kg	39.0	--	1	A
Aroclor 1260	ND		ug/kg	39.0	--	1	A
Aroclor 1262	ND		ug/kg	39.0	--	1	A
Aroclor 1268	ND		ug/kg	39.0	--	1	A
PCBs, Total	ND		ug/kg	39.0	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	52		30-150	A
Decachlorobiphenyl	53		30-150	A
2,4,5,6-Tetrachloro-m-xylene	56		30-150	B
Decachlorobiphenyl	58		30-150	B

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576

Project Number: 0139-107911 **Report Date:** 03/02/15

SAMPLE RESULTS

Lab ID:	L1503576-02	Date Collected:	02/25/15 11:00
Client ID:	CDM-1 5'-9'	Date Received:	02/25/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/26/15 16:11
Analytical Date:	02/27/15 14:19	Cleanup Method:	EPA 3665A
Analyst:	JT	Cleanup Date:	02/27/15
Percent Solids:	85%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/27/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	37.8	--	1	A
Aroclor 1221	ND		ug/kg	37.8	--	1	A
Aroclor 1232	ND		ug/kg	37.8	--	1	A
Aroclor 1242	ND		ug/kg	37.8	--	1	A
Aroclor 1248	ND		ug/kg	37.8	--	1	A
Aroclor 1254	ND		ug/kg	37.8	--	1	A
Aroclor 1260	ND		ug/kg	37.8	--	1	A
Aroclor 1262	ND		ug/kg	37.8	--	1	A
Aroclor 1268	ND		ug/kg	37.8	--	1	A
PCBs, Total	ND		ug/kg	37.8	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	56		30-150	A
Decachlorobiphenyl	69		30-150	A
2,4,5,6-Tetrachloro-m-xylene	51		30-150	B
Decachlorobiphenyl	72		30-150	B

Project Name: KING OPEN SCHOOL
Lab Number: L1503576
Project Number: 0139-107911
Report Date: 03/02/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 02/26/15 15:32
Analyst: JW

Extraction Method: EPA 3546
Extraction Date: 02/26/15 00:13
Cleanup Method: EPA 3665A
Cleanup Date: 02/26/15
Cleanup Method: EPA 3660B
Cleanup Date: 02/26/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG764881-1						
Aroclor 1016	ND		ug/kg	31.9	--	A
Aroclor 1221	ND		ug/kg	31.9	--	A
Aroclor 1232	ND		ug/kg	31.9	--	A
Aroclor 1242	ND		ug/kg	31.9	--	A
Aroclor 1248	ND		ug/kg	31.9	--	A
Aroclor 1254	ND		ug/kg	31.9	--	A
Aroclor 1260	ND		ug/kg	31.9	--	A
Aroclor 1262	ND		ug/kg	31.9	--	A
Aroclor 1268	ND		ug/kg	31.9	--	A
PCBs, Total	ND		ug/kg	31.9	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	78		30-150	A
Decachlorobiphenyl	80		30-150	A
2,4,5,6-Tetrachloro-m-xylene	84		30-150	B
Decachlorobiphenyl	88		30-150	B

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503576
Report Date: 03/02/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 02/27/15 13:29
Analyst: JT

Extraction Method: EPA 3546
Extraction Date: 02/26/15 16:11
Cleanup Method: EPA 3665A
Cleanup Date: 02/27/15
Cleanup Method: EPA 3660B
Cleanup Date: 02/27/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 02 Batch: WG765037-1						
Aroclor 1016	ND		ug/kg	32.1	--	A
Aroclor 1221	ND		ug/kg	32.1	--	A
Aroclor 1232	ND		ug/kg	32.1	--	A
Aroclor 1242	ND		ug/kg	32.1	--	A
Aroclor 1248	ND		ug/kg	32.1	--	A
Aroclor 1254	ND		ug/kg	32.1	--	A
Aroclor 1260	ND		ug/kg	32.1	--	A
Aroclor 1262	ND		ug/kg	32.1	--	A
Aroclor 1268	ND		ug/kg	32.1	--	A
PCBs, Total	ND		ug/kg	32.1	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	62		30-150	A
Decachlorobiphenyl	79		30-150	A
2,4,5,6-Tetrachloro-m-xylene	56		30-150	B
Decachlorobiphenyl	79		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG764881-2 WG764881-3									
Aroclor 1016	79		77		40-140	3		30	A
Aroclor 1260	83		83		40-140	0		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	80		78		30-150	A
Decachlorobiphenyl	82		87		30-150	A
2,4,5,6-Tetrachloro-m-xylene	85		83		30-150	B
Decachlorobiphenyl	94		93		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503576
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 02 Batch: WG765037-2 WG765037-3									
Aroclor 1016	68		74		40-140	8		30	A
Aroclor 1260	66		73		40-140	10		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	61		68		30-150	A
Decachlorobiphenyl	78		86		30-150	A
2,4,5,6-Tetrachloro-m-xylene	52		59		30-150	B
Decachlorobiphenyl	76		85		30-150	B

METALS

Project Name: KING OPEN SCHOOL
Lab Number: L1503576
Project Number: 0139-107911
Report Date: 03/02/15

SAMPLE RESULTS

Lab ID: L1503576-01
Date Collected: 02/25/15 10:45
Client ID: CDM-1 1'-5'
Date Received: 02/25/15
Sample Location: CAMBRIDGE, MA
Field Prep: Not Specified
Matrix: Soil
Percent Solids: 84%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	4.0		mg/kg	0.46	--	1	02/26/15 07:00	02/26/15 13:15	EPA 3050B	97,6010C	JH
Barium, Total	28		mg/kg	0.46	--	1	02/26/15 07:00	02/26/15 13:15	EPA 3050B	97,6010C	JH
Cadmium, Total	ND		mg/kg	0.46	--	1	02/26/15 07:00	02/26/15 13:15	EPA 3050B	97,6010C	JH
Chromium, Total	11		mg/kg	0.46	--	1	02/26/15 07:00	02/26/15 13:15	EPA 3050B	97,6010C	JH
Lead, Total	28		mg/kg	2.3	--	1	02/26/15 07:00	02/26/15 13:15	EPA 3050B	97,6010C	JH
Mercury, Total	ND		mg/kg	0.082	--	1	02/26/15 05:58	02/27/15 10:38	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.3	--	1	02/26/15 07:00	02/26/15 13:15	EPA 3050B	97,6010C	JH
Silver, Total	ND		mg/kg	0.46	--	1	02/26/15 07:00	02/26/15 13:15	EPA 3050B	97,6010C	JH

Project Name: KING OPEN SCHOOL
Lab Number: L1503576
Project Number: 0139-107911
Report Date: 03/02/15

SAMPLE RESULTS

Lab ID: L1503576-02
Date Collected: 02/25/15 11:00
Client ID: CDM-1 5'-9'
Date Received: 02/25/15
Sample Location: CAMBRIDGE, MA
Field Prep: Not Specified
Matrix: Soil
Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	1.9		mg/kg	0.45	--	1	02/26/15 07:00	02/26/15 13:19	EPA 3050B	97,6010C	JH
Barium, Total	8.1		mg/kg	0.45	--	1	02/26/15 07:00	02/26/15 13:19	EPA 3050B	97,6010C	JH
Cadmium, Total	ND		mg/kg	0.45	--	1	02/26/15 07:00	02/26/15 13:19	EPA 3050B	97,6010C	JH
Chromium, Total	8.4		mg/kg	0.45	--	1	02/26/15 07:00	02/26/15 13:19	EPA 3050B	97,6010C	JH
Lead, Total	3.6		mg/kg	2.3	--	1	02/26/15 07:00	02/26/15 13:19	EPA 3050B	97,6010C	JH
Mercury, Total	1.62		mg/kg	0.080	--	1	02/26/15 05:58	02/27/15 10:40	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.3	--	1	02/26/15 07:00	02/26/15 13:19	EPA 3050B	97,6010C	JH
Silver, Total	ND		mg/kg	0.45	--	1	02/26/15 07:00	02/26/15 13:19	EPA 3050B	97,6010C	JH

Project Name: KING OPEN SCHOOL **Lab Number:** L1503576
Project Number: 0139-107911 **Report Date:** 03/02/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG764901-1										
Mercury, Total	ND		mg/kg	0.083	--	1	02/26/15 05:58	02/27/15 10:24	97,7471B	MC

Prep Information

Digestion Method: EPA 7471B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG764910-1										
Arsenic, Total	ND		mg/kg	0.40	--	1	02/26/15 07:00	02/26/15 12:29	97,6010C	JH
Barium, Total	ND		mg/kg	0.40	--	1	02/26/15 07:00	02/26/15 12:29	97,6010C	JH
Cadmium, Total	ND		mg/kg	0.40	--	1	02/26/15 07:00	02/26/15 12:29	97,6010C	JH
Chromium, Total	ND		mg/kg	0.40	--	1	02/26/15 07:00	02/26/15 12:29	97,6010C	JH
Lead, Total	ND		mg/kg	2.0	--	1	02/26/15 07:00	02/26/15 12:29	97,6010C	JH
Selenium, Total	ND		mg/kg	2.0	--	1	02/26/15 07:00	02/26/15 12:29	97,6010C	JH
Silver, Total	ND		mg/kg	0.40	--	1	02/26/15 07:00	02/26/15 12:29	97,6010C	JH

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1503576
Project Number: 0139-107911
Report Date: 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG764901-2 WG764901-3 SRM Lot Number: D083-540								
Mercury, Total	123		125		75-126	2		30
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG764910-2 WG764910-3 SRM Lot Number: D083-540								
Arsenic, Total	90		90		78-122	0		30
Barium, Total	90		84		82-117	7		30
Cadmium, Total	84		86		82-118	2		30
Chromium, Total	80		**78**	Q	79-121	3		30
Lead, Total	85		83		81-119	2		30
Selenium, Total	90		90		78-123	0		30
Silver, Total	88		88		74-125	0		30

INORGANICS
&
MISCELLANEOUS

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

SAMPLE RESULTS

Lab ID: L1503576-01
Client ID: CDM-1 1'-5'
Sample Location: CAMBRIDGE, MA
Matrix: Soil

Date Collected: 02/25/15 10:45
Date Received: 02/25/15
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	83.8		%	0.100	NA	1	-	02/26/15 01:05	30,2540G	RT

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503576
Report Date: 03/02/15

SAMPLE RESULTS

Lab ID: L1503576-02
Client ID: CDM-1 5'-9'
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Date Collected: 02/25/15 11:00
Date Received: 02/25/15
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	85.0		%	0.100	NA	1	-	02/26/15 01:05	30,2540G	RT

Lab Duplicate Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503576
Report Date: 03/02/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG764889-1 QC Sample: L1503545-01 Client ID: DUP Sample						
Solids, Total	83.3	83.3	%	0		20

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: 02/25/2015 20:21

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503576-01A	Vial MeOH preserved	A	N/A	3.2	Y	Absent	MCP-8260HLW-10(14)
L1503576-01B	Vial water preserved	A	N/A	3.2	Y	Absent	MCP-8260HLW-10(14)
L1503576-01C	Vial water preserved	A	N/A	3.2	Y	Absent	MCP-8260HLW-10(14)
L1503576-01D	Glass 120ml/4oz unpreserved	A	N/A	3.2	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1503576-01E	Glass 250ml/8oz unpreserved	A	N/A	3.2	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1503576-02A	Vial MeOH preserved	A	N/A	3.2	Y	Absent	MCP-8260HLW-10(14)
L1503576-02B	Vial water preserved	A	N/A	3.2	Y	Absent	MCP-8260HLW-10(14)
L1503576-02C	Vial water preserved	A	N/A	3.2	Y	Absent	MCP-8260HLW-10(14)
L1503576-02D	Glass 120ml/4oz unpreserved	A	N/A	3.2	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)

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*Values in parentheses indicate holding time in days

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503576
Report Date: 03/02/15

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503576-02E	Glass 250ml/8oz unpreserved	A	N/A	3.2	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL - Estimated 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 EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

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

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

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 ten times (10x) 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. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

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.

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503576
Project Number:	0139-107911	**Report Date:**	03/02/15

Data Qualifiers

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 lower value for the two columns 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.

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.

S - Analytical results are from modified screening analysis.

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

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.

98 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, 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.

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: 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
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

Revised COC - MMM 2/26/15 Serial_No:03021518:41

CHAIN OF CUSTODY

PAGE ___ OF ___

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: 2/25/15

ALPHA Job #: L1503576

Project Information

Project Name: King Open School

Project Location: Cambridge, MA

Project #: 0139-107911

Project Manager: Jay McMullen

ALPHA Quote #:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL

☒ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Client Information

Client: CDM Smith

Address: 50 HAMPSHIRE ST CAMBRIDGE, MA 02139

Phone: 617 452 6419

Fax:

Email: wroee@cdmsmith.com

☐ These samples have been previously analyzed by Alpha

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?

Turn-Around Time

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

Date Due: 3/4/15 Time:

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)

RUN TCLP IF 20X RULE EXCEEDED

ANALYSIS: VOC ~~6240~~ 8260, SVOC ABN, METALS RCRA8, EPH RANGES ONLY, PCB

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	VOC 8260	SVOC ABN	METALS RCRA8	EPH RANGES ONLY	PCB	Sample Specific Comments	TOTAL # BOTTLES
03576-01	CDM-1 ~~0~~ 1'-5'	2/25	10:45	S	EW	X	X	X	X	X		
-02	~~CDM-2 5'-9'~~ CDM-1 5'-9'	2/25	11:00	S	EW	X	X	X	X	X		

Container Type	V	V	A	A	A
Preservative	H	A	A	A	A

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	2/25/15 2:30	[signature] AAL	2/25/15 1430
[signature]	2/25/15 1833	[signature]	2/25/15 18:33

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 ____ OF ____

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: 2/25/15

ALPHA Job #: L1503576

Client Information

Client: CDM Smith

Address: 50 HAMPSHIRE ST CAMBRIDGE, MA 02139

Phone: 617 452 6419

Fax:

Email: wroee@cdmsmith.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: King Open School

Project Location: Cambridge, MA

Project #: 0139-107911

Project Manager: Jay McMullen

ALPHA Quote #:

Turn-Around Time

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

Date Due: 3/4/15 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)

RUN TCLP if 20x RULE EXCEEDED

ANALYSIS

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOC 6260	SVOC ABN	METALS RCRA8	EPH RANGES ONLY	PCB	Sample Specific Comments	TOTAL # BOTTLES
03576-01	CDM-1 ~~0~~ 1'-5'	2/25	10:45	S	EW	X	X	X	X	X		
-02	CDM-2 5'-9'	2/25	11:00	S	EW	X	X	X	X			

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

	VOC 6260	SVOC ABN	METALS RCRA8	EPH RANGES ONLY	PCB
Container Type	V	V	A	A	A
Preservative	H	A	A	A	A

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
Elizabeth Wr[illegible]	2/25/15 2:30	[signature] AAL	2/25/15 1430
[signature]	2/25/15 1833	[signature]	2/25/15 18:33

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)

7A
Volatile Organics CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503576

Instrument ID: Voa104.i Calibration Date: 27-FEB-2015 Time: 08:07

Lab File ID: 0227A02 Init. Calib. Date(s): 14-NOV-2 14-NOV-2

Sample No: 8260 CCAL Init. Calib. Times : 18:34 21:39

Compound	$\overline{RRF}$	RRF	MIN RRF	%D	MAX %D	
dichlorodifluoromethane	.16305	.13899	.1	-15	20	
chloromethane	.31614	.28889	.1	-9	20	
vinyl chloride	.2743	.26683	.1	-3	20	
bromomethane	100	88.967	.1	-11	20	
chloroethane	.13774	.15193	.1	10	20	
trichlorofluoromethane	.27387	.29893	.1	9	20	
ethyl ether	.09232	.09713	.05	5	20	
1,1,-dichloroethene	.2177	.19982	.1	-8	20	
carbon disulfide	.70085	.64762	.1	-8	20	
methylene chloride	.26137	.26416	.1	1	20	
acetone	100	130	.1	30	20	F
trans-1,2-dichloroethene	.25442	.26485	.1	4	20	
methyl tert butyl ether	.55986	.56065	.1	0	20	
Diisopropyl Ether	.94156	1.0576	.05	12	20	
1,1-dichloroethane	.49595	.5245	.2	6	20	
Ethyl-Tert-Butyl-Ether	.82014	.86583	.05	6	20	
cis-1,2-dichloroethene	.28074	.30236	.1	8	20	
2,2-dichloropropane	.35677	.38855	.05	9	20	
bromochloromethane	.12861	.13329	.05	4	20	
chloroform	.44837	.49512	.2	10	20	
carbontetrachloride	.32832	.37789	.1	15	20	
tetrahydrofuran	.06814	.07355	.05	8	20	
1,1,1-trichloroethane	.37681	.423	.1	12	20	
2-butanone	.09192	.10234	.1	11	20	F
1,1-dichloropropene	.33481	.38037	.05	14	20	
benzene	.97656	1.0589	.5	8	20	
Tertiary-Amyl Methyl Ether	.62875	.66096	.05	5	20	
1,2-dichloroethane	.30244	.32544	.1	8	20	
trichloroethene	.264	.30344	.2	15	20	
dibromomethane	.14205	.14724	.05	4	20	
1,2-dichloropropane	.27957	.31663	.1	13	20	
bromodichloromethane	.33098	.3821	.2	15	20	
1,4-dioxane	.00202	.00197	.05	-2	20	F
cis-1,3-dichloropropene	.39239	.4404	.2	12	20	
toluene	.87644	.97154	.4	11	20	
tetrachloroethene	.36363	.42986	.2	18	20	
4-methyl-2-pentanone	.07517	.08435	.1	12	20	F
trans-1,3-dichloropropene	.46349	.51288	.1	11	20	

FORM VII MCP-8260HLW-10

7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503576

Instrument ID: Voa104.i   Calibration Date: 27-FEB-2015 Time: 08:07

Lab File ID: 0227A02   Init. Calib. Date(s): 14-NOV-2   14-NOV-2

Sample No: 8260 CCAL   Init. Calib. Times : 18:34   21:39

Compound	$\overline{RRF}$	RRF	MIN RRF	%D	MAX %D	
1,1,2-trichloroethane	.23224	.25391	.1	9	20	
chlorodibromomethane	.34856	.38519	.1	11	20	
1,3-dichloropropane	.45928	.50027	.05	9	20	
1,2-dibromoethane	.28223	.29792	.1	6	20	
2-hexanone	.19278	.2123	.1	10	20	
chlorobenzene	1.0010	1.1386	.5	14	20	
ethyl benzene	1.6393	1.9696	.1	20	20	F
1,1,1,2-tetrachloroethane	.3581	.40934	.05	14	20	
p/m xylene	.63448	.76656	.1	21	20	F
o xylene	.6125	.7283	.3	19	20	
styrene	1.0136	1.1946	.3	18	20	
bromoform	.39846	.4293	.1	8	20	
isopropylbenzene	3.1932	3.8447	.1	20	20	F
bromobenzene	.84329	.92762	.05	10	20	
n-propylbenzene	3.6352	4.5371	.05	25	20	F
1,1,2,2,-tetrachloroethane	.67812	.73179	.3	8	20	
2-chlorotoluene	2.3296	2.7235	.05	17	20	
1,2,3-trichloropropane	.49557	.53309	.05	8	20	
1,3,5-trimethybenzene	2.6303	3.2013	.05	22	20	F
4-chorotoluene	2.2427	2.6643	.05	19	20	
tert-butylbenzene	2.2838	2.7507	.05	20	20	F
1,2,4-trimethylbenzene	2.6527	3.2028	.05	21	20	F
sec-butylbenzene	3.4242	4.2460	.05	24	20	F
p-isopropyltoluene	2.8275	3.5461	.05	25	20	F
1,3-dichlorobenzene	1.5651	1.8477	.6	18	20	
1,4-dichlorobenzene	1.6000	1.8160	.5	13	20	
n-butylbenzene	2.4383	3.2272	.05	32	20	F
1,2-dichlorobenzene	1.4443	1.6365	.4	13	20	
1,2-dibromo-3-chloropropane	.10573	.1057	.05	0	20	
hexachlorobutadiene	.45607	.54574	.05	20	20	
1,2,4-trichlorobenzene	.95262	1.1201	.2	18	20	
naphthalene	2.1836	2.2289	.05	2	20	
1,2,3-trichlorobenzene	.88772	.98096	.05	11	20	
dibromofluoromethane	.2538	.25995	.05	2	30	
1,2-dichloroethane-d4	.22706	.22798	.05	0	30	
toluene-d8	1.3076	1.3131	.05	0	30	
4-bromofluorobenzene	.90729	.92815	.05	2	30	

FORM VII MCP-8260HLW-10

ANALYTICAL REPORT

Lab Number:	L1503333
Client:	CDM Smith, Inc. 1 Cambridge Place 50 Hampshire Street Cambridge, MA 02139
ATTN:	Jay McMullen
Phone:	(617) 452-6303
Project Name:	KING OPEN SCHOOL
Project Number:	0139-107911
Report Date:	02/27/15

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

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

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1503333-01	CDM-2 1'-5'	SOIL	CAMBRIDGE, MA	02/23/15 09:17	02/23/15
L1503333-02	CDM-2 5'-9'	SOIL	CAMBRIDGE, MA	02/23/15 09:40	02/23/15

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

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).	YES
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)?	NO

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.

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. All specific QC 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. 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 (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar 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. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Metals.

Volatile Organics

In reference to question H:

L1503333-01: The internal standard (IS) responses for chlorobenzene-d5 (45%) and 1,4-dichlorobenzene-d4 (8%) and the surrogate recoveries for toluene-d8 (146%) and 4-bromofluorobenzene (158%) were outside the acceptance criteria; however, re-analysis achieved similar results: chlorobenzene-d5 (26%) and 1,4-dichlorobenzene-d4 (8%) and 1,2-dichloroethane-d4 (132%), toluene-d8 (166%), 4-bromofluorobenzene (159%), and dibromofluoromethane (140%). The results of both analyses are reported; however, since the IS response was below the method criteria, all associated compounds and surrogate recoveries are considered to have a potentially high bias. In addition, because the internal standard responses were below the rejection criteria at less than 20% recovery, a high-level analysis was performed and those results are also reported.

L1503333-02: The internal standard (IS) responses for fluorobenzene (45%), chlorobenzene-d5 (43%), and 1,4-dichlorobenzene-d4 (33%) and the surrogate recovery for 1,2-dichloroethane-d4 (133%) were outside the acceptance criteria; however, re-analysis achieved similar results: 1,4-dichlorobenzene-d4 (26%) and toluene-d8 (133%) and 4-bromofluorobenzene (146%). The results of both analyses are reported; however, since the IS response was below method criteria, all associated compounds and surrogate recoveries are considered to have a potentially high bias.

L1503333-02: The acetone result should be considered estimated because the concentration exceeded the level of calibration. This analyte was not present in the high-level screen analysis.

The initial calibration, associated with L1503333-01 and -02, did not meet the method required minimum response factor on the lowest calibration standard for 4-methyl-2-pentanone (0.05631) and 1,4-dioxane (0.00244), as well as the average response factor for 2-butanone, 4-methyl-2-pentanone, and 1,4-dioxane.

The initial calibration verification is outside acceptance criteria for dichlorodifluoromethane (144%), but within overall method criteria.

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

Case Narrative (continued)

The continuing calibration standards, associated with L1503333-01 and -02, are outside the acceptance criteria for several compounds; however, they are within overall method allowances. A copy of the continuing calibration standards is included as an addendum to this report.

EPH

In reference to question I:

All samples were analyzed for a subset of MCP compounds per the Chain of Custody.

Metals

In reference to question I:

All samples were analyzed for a subset of MCP elements per the Chain of Custody.

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: 02/27/15

189

ORGANICS

VOLATILES

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503333
Project Number:	0139-107911	**Report Date:**	02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Analytical Method:	97,8260C		
Analytical Date:	02/25/15 11:11		
Analyst:	BN		
Percent Solids:	78%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	19	--	1
1,1-Dichloroethane	ND		ug/kg	2.9	--	1
Chloroform	ND		ug/kg	2.9	--	1
Carbon tetrachloride	ND		ug/kg	1.9	--	1
1,2-Dichloropropane	ND		ug/kg	6.8	--	1
Dibromochloromethane	ND		ug/kg	1.9	--	1
1,1,2-Trichloroethane	ND		ug/kg	2.9	--	1
Tetrachloroethene	ND		ug/kg	1.9	--	1
Chlorobenzene	ND		ug/kg	1.9	--	1
Trichlorofluoromethane	ND		ug/kg	7.7	--	1
1,2-Dichloroethane	ND		ug/kg	1.9	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.9	--	1
Bromodichloromethane	ND		ug/kg	1.9	--	1
trans-1,3-Dichloropropene	ND		ug/kg	1.9	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.9	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.9	--	1
1,1-Dichloropropene	ND		ug/kg	7.7	--	1
Bromoform	ND		ug/kg	7.7	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.9	--	1
Benzene	ND		ug/kg	1.9	--	1
Toluene	ND		ug/kg	2.9	--	1
Ethylbenzene	ND		ug/kg	1.9	--	1
Chloromethane	ND		ug/kg	7.7	--	1
Bromomethane	ND		ug/kg	3.9	--	1
Vinyl chloride	ND		ug/kg	3.9	--	1
Chloroethane	ND		ug/kg	3.9	--	1
1,1-Dichloroethene	ND		ug/kg	1.9	--	1
trans-1,2-Dichloroethene	ND		ug/kg	2.9	--	1
Trichloroethene	ND		ug/kg	1.9	--	1
1,2-Dichlorobenzene	ND		ug/kg	7.7	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333

Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	7.7	--	1
1,4-Dichlorobenzene	ND		ug/kg	7.7	--	1
Methyl tert butyl ether	ND		ug/kg	3.9	--	1
p/m-Xylene	ND		ug/kg	3.9	--	1
o-Xylene	ND		ug/kg	3.9	--	1
Xylenes, Total	ND		ug/kg	3.9	--	1
cis-1,2-Dichloroethene	ND		ug/kg	1.9	--	1
1,2-Dichloroethene, Total	ND		ug/kg	1.9	--	1
Dibromomethane	ND		ug/kg	7.7	--	1
1,2,3-Trichloropropane	ND		ug/kg	7.7	--	1
Styrene	ND		ug/kg	3.9	--	1
Dichlorodifluoromethane	ND		ug/kg	19	--	1
Acetone	ND		ug/kg	70	--	1
Carbon disulfide	ND		ug/kg	7.7	--	1
Methyl ethyl ketone	ND		ug/kg	19	--	1
Methyl isobutyl ketone	ND		ug/kg	19	--	1
2-Hexanone	ND		ug/kg	19	--	1
Bromochloromethane	ND		ug/kg	7.7	--	1
Tetrahydrofuran	ND		ug/kg	7.7	--	1
2,2-Dichloropropane	ND		ug/kg	9.7	--	1
1,2-Dibromoethane	ND		ug/kg	7.7	--	1
1,3-Dichloropropane	ND		ug/kg	7.7	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.9	--	1
Bromobenzene	ND		ug/kg	9.7	--	1
n-Butylbenzene	ND		ug/kg	1.9	--	1
sec-Butylbenzene	ND		ug/kg	1.9	--	1
tert-Butylbenzene	ND		ug/kg	7.7	--	1
o-Chlorotoluene	ND		ug/kg	7.7	--	1
p-Chlorotoluene	ND		ug/kg	7.7	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	7.7	--	1
Hexachlorobutadiene	ND		ug/kg	7.7	--	1
Isopropylbenzene	ND		ug/kg	1.9	--	1
p-Isopropyltoluene	ND		ug/kg	1.9	--	1
Naphthalene	ND		ug/kg	7.7	--	1
n-Propylbenzene	ND		ug/kg	1.9	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	7.7	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	7.7	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	7.7	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	7.7	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	9.7	--	1
Diisopropyl Ether	ND		ug/kg	7.7	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	7.7	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	7.7	--	1
1,4-Dioxane	ND		ug/kg	77	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	123		70-130
Toluene-d8	**146**	Q	70-130
4-Bromofluorobenzene	**158**	Q	70-130
Dibromofluoromethane	123		70-130

Project Name: KING OPEN SCHOOL

Project Number: 0139-107911

Lab Number: L1503333

Report Date: 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Analytical Method:	97,8260C		
Analytical Date:	02/26/15 11:34		
Analyst:	MV		
Percent Solids:	78%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	1200	--	1
1,1-Dichloroethane	ND		ug/kg	170	--	1
Chloroform	ND		ug/kg	170	--	1
Carbon tetrachloride	ND		ug/kg	120	--	1
1,2-Dichloropropane	ND		ug/kg	400	--	1
Dibromochloromethane	ND		ug/kg	120	--	1
1,1,2-Trichloroethane	ND		ug/kg	170	--	1
Tetrachloroethene	ND		ug/kg	120	--	1
Chlorobenzene	ND		ug/kg	120	--	1
Trichlorofluoromethane	ND		ug/kg	460	--	1
1,2-Dichloroethane	ND		ug/kg	120	--	1
1,1,1-Trichloroethane	ND		ug/kg	120	--	1
Bromodichloromethane	ND		ug/kg	120	--	1
trans-1,3-Dichloropropene	ND		ug/kg	120	--	1
cis-1,3-Dichloropropene	ND		ug/kg	120	--	1
1,3-Dichloropropene, Total	ND		ug/kg	120	--	1
1,1-Dichloropropene	ND		ug/kg	460	--	1
Bromoform	ND		ug/kg	460	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	120	--	1
Benzene	ND		ug/kg	120	--	1
Toluene	ND		ug/kg	170	--	1
Ethylbenzene	ND		ug/kg	120	--	1
Chloromethane	ND		ug/kg	460	--	1
Bromomethane	ND		ug/kg	230	--	1
Vinyl chloride	ND		ug/kg	230	--	1
Chloroethane	ND		ug/kg	230	--	1
1,1-Dichloroethene	ND		ug/kg	120	--	1
trans-1,2-Dichloroethene	ND		ug/kg	170	--	1
Trichloroethene	ND		ug/kg	120	--	1
1,2-Dichlorobenzene	ND		ug/kg	460	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333

Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID: L1503333-01 Date Collected: 02/23/15 09:17

Client ID: CDM-2 1'-5' Date Received: 02/23/15

Sample Location: CAMBRIDGE, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	460	--	1
1,4-Dichlorobenzene	ND		ug/kg	460	--	1
Methyl tert butyl ether	ND		ug/kg	230	--	1
p/m-Xylene	ND		ug/kg	230	--	1
o-Xylene	ND		ug/kg	230	--	1
Xylenes, Total	ND		ug/kg	230	--	1
cis-1,2-Dichloroethene	ND		ug/kg	120	--	1
1,2-Dichloroethene, Total	ND		ug/kg	120	--	1
Dibromomethane	ND		ug/kg	460	--	1
1,2,3-Trichloropropane	ND		ug/kg	460	--	1
Styrene	ND		ug/kg	230	--	1
Dichlorodifluoromethane	ND		ug/kg	1200	--	1
Acetone	ND		ug/kg	4200	--	1
Carbon disulfide	ND		ug/kg	460	--	1
Methyl ethyl ketone	ND		ug/kg	1200	--	1
Methyl isobutyl ketone	ND		ug/kg	1200	--	1
2-Hexanone	ND		ug/kg	1200	--	1
Bromochloromethane	ND		ug/kg	460	--	1
Tetrahydrofuran	ND		ug/kg	460	--	1
2,2-Dichloropropane	ND		ug/kg	580	--	1
1,2-Dibromoethane	ND		ug/kg	460	--	1
1,3-Dichloropropane	ND		ug/kg	460	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	120	--	1
Bromobenzene	ND		ug/kg	580	--	1
n-Butylbenzene	ND		ug/kg	120	--	1
sec-Butylbenzene	ND		ug/kg	120	--	1
tert-Butylbenzene	ND		ug/kg	460	--	1
o-Chlorotoluene	ND		ug/kg	460	--	1
p-Chlorotoluene	ND		ug/kg	460	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	460	--	1
Hexachlorobutadiene	ND		ug/kg	460	--	1
Isopropylbenzene	ND		ug/kg	120	--	1
p-Isopropyltoluene	ND		ug/kg	120	--	1
Naphthalene	ND		ug/kg	460	--	1
n-Propylbenzene	ND		ug/kg	120	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	460	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	460	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	460	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	460	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333

Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 5035 High - Westborough Lab						
Diethyl ether	ND		ug/kg	580	--	1
Diisopropyl Ether	ND		ug/kg	460	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	460	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	460	--	1
1,4-Dioxane	ND		ug/kg	12000	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	100		70-130

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503333
Project Number:	0139-107911	**Report Date:**	02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	R	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'		Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA		Field Prep:	Not Specified
Matrix:	Soil			
Analytical Method:	97,8260C			
Analytical Date:	02/25/15 18:13			
Analyst:	BN			
Percent Solids:	78%			

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	17	--	1
1,1-Dichloroethane	ND		ug/kg	2.6	--	1
Chloroform	ND		ug/kg	2.6	--	1
Carbon tetrachloride	ND		ug/kg	1.7	--	1
1,2-Dichloropropane	ND		ug/kg	6.0	--	1
Dibromochloromethane	ND		ug/kg	1.7	--	1
1,1,2-Trichloroethane	ND		ug/kg	2.6	--	1
Tetrachloroethene	ND		ug/kg	1.7	--	1
Chlorobenzene	ND		ug/kg	1.7	--	1
Trichlorofluoromethane	ND		ug/kg	6.9	--	1
1,2-Dichloroethane	ND		ug/kg	1.7	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.7	--	1
Bromodichloromethane	ND		ug/kg	1.7	--	1
trans-1,3-Dichloropropene	ND		ug/kg	1.7	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.7	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.7	--	1
1,1-Dichloropropene	ND		ug/kg	6.9	--	1
Bromoform	ND		ug/kg	6.9	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.7	--	1
Benzene	ND		ug/kg	1.7	--	1
Toluene	ND		ug/kg	2.6	--	1
Ethylbenzene	ND		ug/kg	1.7	--	1
Chloromethane	ND		ug/kg	6.9	--	1
Bromomethane	ND		ug/kg	3.4	--	1
Vinyl chloride	ND		ug/kg	3.4	--	1
Chloroethane	ND		ug/kg	3.4	--	1
1,1-Dichloroethene	ND		ug/kg	1.7	--	1
trans-1,2-Dichloroethene	ND		ug/kg	2.6	--	1
Trichloroethene	ND		ug/kg	1.7	--	1
1,2-Dichlorobenzene	ND		ug/kg	6.9	--	1

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503333
Project Number:	0139-107911	**Report Date:**	02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	R	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'		Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA		Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	6.9	--	1
1,4-Dichlorobenzene	ND		ug/kg	6.9	--	1
Methyl tert butyl ether	ND		ug/kg	3.4	--	1
p/m-Xylene	ND		ug/kg	3.4	--	1
o-Xylene	ND		ug/kg	3.4	--	1
Xylenes, Total	ND		ug/kg	3.4	--	1
cis-1,2-Dichloroethene	ND		ug/kg	1.7	--	1
1,2-Dichloroethene, Total	ND		ug/kg	1.7	--	1
Dibromomethane	ND		ug/kg	6.9	--	1
1,2,3-Trichloropropane	ND		ug/kg	6.9	--	1
Styrene	ND		ug/kg	3.4	--	1
Dichlorodifluoromethane	ND		ug/kg	17	--	1
Acetone	ND		ug/kg	62	--	1
Carbon disulfide	ND		ug/kg	6.9	--	1
Methyl ethyl ketone	ND		ug/kg	17	--	1
Methyl isobutyl ketone	ND		ug/kg	17	--	1
2-Hexanone	ND		ug/kg	17	--	1
Bromochloromethane	ND		ug/kg	6.9	--	1
Tetrahydrofuran	ND		ug/kg	6.9	--	1
2,2-Dichloropropane	ND		ug/kg	8.6	--	1
1,2-Dibromoethane	ND		ug/kg	6.9	--	1
1,3-Dichloropropane	ND		ug/kg	6.9	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.7	--	1
Bromobenzene	ND		ug/kg	8.6	--	1
n-Butylbenzene	ND		ug/kg	1.7	--	1
sec-Butylbenzene	ND		ug/kg	1.7	--	1
tert-Butylbenzene	ND		ug/kg	6.9	--	1
o-Chlorotoluene	ND		ug/kg	6.9	--	1
p-Chlorotoluene	ND		ug/kg	6.9	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	6.9	--	1
Hexachlorobutadiene	ND		ug/kg	6.9	--	1
Isopropylbenzene	ND		ug/kg	1.7	--	1
p-Isopropyltoluene	ND		ug/kg	1.7	--	1
Naphthalene	ND		ug/kg	6.9	--	1
n-Propylbenzene	ND		ug/kg	1.7	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	6.9	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	6.9	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	6.9	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	6.9	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333

Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	R	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'		Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA		Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	8.6	--	1
Diisopropyl Ether	ND		ug/kg	6.9	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	6.9	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	6.9	--	1
1,4-Dioxane	ND		ug/kg	69	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	**132**	Q	70-130
Toluene-d8	**166**	Q	70-130
4-Bromofluorobenzene	**159**	Q	70-130
Dibromofluoromethane	**140**	Q	70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333

Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-02	Date Collected:	02/23/15 09:40
Client ID:	CDM-2 5'-9'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Analytical Method:	97,8260C		
Analytical Date:	02/25/15 11:38		
Analyst:	BN		
Percent Solids:	78%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	6.8	--	1
1,1-Dichloroethane	ND		ug/kg	1.0	--	1
Chloroform	ND		ug/kg	1.0	--	1
Carbon tetrachloride	ND		ug/kg	0.68	--	1
1,2-Dichloropropane	ND		ug/kg	2.4	--	1
Dibromochloromethane	ND		ug/kg	0.68	--	1
1,1,2-Trichloroethane	ND		ug/kg	1.0	--	1
Tetrachloroethene	ND		ug/kg	0.68	--	1
Chlorobenzene	ND		ug/kg	0.68	--	1
Trichlorofluoromethane	ND		ug/kg	2.7	--	1
1,2-Dichloroethane	ND		ug/kg	0.68	--	1
1,1,1-Trichloroethane	ND		ug/kg	0.68	--	1
Bromodichloromethane	ND		ug/kg	0.68	--	1
trans-1,3-Dichloropropene	ND		ug/kg	0.68	--	1
cis-1,3-Dichloropropene	ND		ug/kg	0.68	--	1
1,3-Dichloropropene, Total	ND		ug/kg	0.68	--	1
1,1-Dichloropropene	ND		ug/kg	2.7	--	1
Bromoform	ND		ug/kg	2.7	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.68	--	1
Benzene	ND		ug/kg	0.68	--	1
Toluene	ND		ug/kg	1.0	--	1
Ethylbenzene	ND		ug/kg	0.68	--	1
Chloromethane	ND		ug/kg	2.7	--	1
Bromomethane	ND		ug/kg	1.4	--	1
Vinyl chloride	ND		ug/kg	1.4	--	1
Chloroethane	ND		ug/kg	1.4	--	1
1,1-Dichloroethene	ND		ug/kg	0.68	--	1
trans-1,2-Dichloroethene	ND		ug/kg	1.0	--	1
Trichloroethene	ND		ug/kg	0.68	--	1
1,2-Dichlorobenzene	ND		ug/kg	2.7	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID: L1503333-02
Client ID: CDM-2 5'-9'
Sample Location: CAMBRIDGE, MA
Date Collected: 02/23/15 09:40
Date Received: 02/23/15
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	2.7	--	1
1,4-Dichlorobenzene	ND		ug/kg	2.7	--	1
Methyl tert butyl ether	ND		ug/kg	1.4	--	1
p/m-Xylene	ND		ug/kg	1.4	--	1
o-Xylene	ND		ug/kg	1.4	--	1
Xylenes, Total	ND		ug/kg	1.4	--	1
cis-1,2-Dichloroethene	ND		ug/kg	0.68	--	1
1,2-Dichloroethene, Total	ND		ug/kg	0.68	--	1
Dibromomethane	ND		ug/kg	2.7	--	1
1,2,3-Trichloropropane	ND		ug/kg	2.7	--	1
Styrene	ND		ug/kg	1.4	--	1
Dichlorodifluoromethane	ND		ug/kg	6.8	--	1
Acetone	32		ug/kg	24	--	1
Carbon disulfide	ND		ug/kg	2.7	--	1
Methyl ethyl ketone	ND		ug/kg	6.8	--	1
Methyl isobutyl ketone	ND		ug/kg	6.8	--	1
2-Hexanone	ND		ug/kg	6.8	--	1
Bromochloromethane	ND		ug/kg	2.7	--	1
Tetrahydrofuran	ND		ug/kg	2.7	--	1
2,2-Dichloropropane	ND		ug/kg	3.4	--	1
1,2-Dibromoethane	ND		ug/kg	2.7	--	1
1,3-Dichloropropane	ND		ug/kg	2.7	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.68	--	1
Bromobenzene	ND		ug/kg	3.4	--	1
n-Butylbenzene	ND		ug/kg	0.68	--	1
sec-Butylbenzene	ND		ug/kg	0.68	--	1
tert-Butylbenzene	ND		ug/kg	2.7	--	1
o-Chlorotoluene	ND		ug/kg	2.7	--	1
p-Chlorotoluene	ND		ug/kg	2.7	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	2.7	--	1
Hexachlorobutadiene	ND		ug/kg	2.7	--	1
Isopropylbenzene	ND		ug/kg	0.68	--	1
p-Isopropyltoluene	ND		ug/kg	0.68	--	1
Naphthalene	ND		ug/kg	2.7	--	1
n-Propylbenzene	ND		ug/kg	0.68	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	2.7	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	2.7	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	2.7	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	2.7	--	1

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Project Name: KING OPEN SCHOOL | **Lab Number:** L1503333

Project Number: 0139-107911 | **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-02	Date Collected:	02/23/15 09:40
Client ID:	CDM-2 5'-9'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	3.4	--	1
Diisopropyl Ether	ND		ug/kg	2.7	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2.7	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	2.7	--	1
1,4-Dioxane	ND		ug/kg	27	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	**133**	Q	70-130
Toluene-d8	104		70-130
4-Bromofluorobenzene	122		70-130
Dibromofluoromethane	110		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-02 R	Date Collected:	02/23/15 09:40
Client ID:	CDM-2 5'-9'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Analytical Method:	97,8260C		
Analytical Date:	02/25/15 18:40		
Analyst:	BN		
Percent Solids:	78%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	15	--	1
1,1-Dichloroethane	ND		ug/kg	2.2	--	1
Chloroform	ND		ug/kg	2.2	--	1
Carbon tetrachloride	ND		ug/kg	1.5	--	1
1,2-Dichloropropane	ND		ug/kg	5.1	--	1
Dibromochloromethane	ND		ug/kg	1.5	--	1
1,1,2-Trichloroethane	ND		ug/kg	2.2	--	1
Tetrachloroethene	ND		ug/kg	1.5	--	1
Chlorobenzene	ND		ug/kg	1.5	--	1
Trichlorofluoromethane	ND		ug/kg	5.8	--	1
1,2-Dichloroethane	ND		ug/kg	1.5	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.5	--	1
Bromodichloromethane	ND		ug/kg	1.5	--	1
trans-1,3-Dichloropropene	ND		ug/kg	1.5	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.5	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.5	--	1
1,1-Dichloropropene	ND		ug/kg	5.8	--	1
Bromoform	ND		ug/kg	5.8	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.5	--	1
Benzene	ND		ug/kg	1.5	--	1
Toluene	ND		ug/kg	2.2	--	1
Ethylbenzene	ND		ug/kg	1.5	--	1
Chloromethane	ND		ug/kg	5.8	--	1
Bromomethane	ND		ug/kg	2.9	--	1
Vinyl chloride	ND		ug/kg	2.9	--	1
Chloroethane	ND		ug/kg	2.9	--	1
1,1-Dichloroethene	ND		ug/kg	1.5	--	1
trans-1,2-Dichloroethene	ND		ug/kg	2.2	--	1
Trichloroethene	ND		ug/kg	1.5	--	1
1,2-Dichlorobenzene	ND		ug/kg	5.8	--	1

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Serial_No:02271515:09

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333

Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-02	R	Date Collected:	02/23/15 09:40
Client ID:	CDM-2 5'-9'		Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA		Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.8	--	1
1,4-Dichlorobenzene	ND		ug/kg	5.8	--	1
Methyl tert butyl ether	ND		ug/kg	2.9	--	1
p/m-Xylene	ND		ug/kg	2.9	--	1
o-Xylene	ND		ug/kg	2.9	--	1
Xylenes, Total	ND		ug/kg	2.9	--	1
cis-1,2-Dichloroethene	ND		ug/kg	1.5	--	1
1,2-Dichloroethene, Total	ND		ug/kg	1.5	--	1
Dibromomethane	ND		ug/kg	5.8	--	1
1,2,3-Trichloropropane	ND		ug/kg	5.8	--	1
Styrene	ND		ug/kg	2.9	--	1
Dichlorodifluoromethane	ND		ug/kg	15	--	1
Acetone	590	E	ug/kg	53	--	1
Carbon disulfide	ND		ug/kg	5.8	--	1
Methyl ethyl ketone	110		ug/kg	15	--	1
Methyl isobutyl ketone	ND		ug/kg	15	--	1
2-Hexanone	ND		ug/kg	15	--	1
Bromochloromethane	ND		ug/kg	5.8	--	1
Tetrahydrofuran	ND		ug/kg	5.8	--	1
2,2-Dichloropropane	ND		ug/kg	7.3	--	1
1,2-Dibromoethane	ND		ug/kg	5.8	--	1
1,3-Dichloropropane	ND		ug/kg	5.8	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.5	--	1
Bromobenzene	ND		ug/kg	7.3	--	1
n-Butylbenzene	ND		ug/kg	1.5	--	1
sec-Butylbenzene	ND		ug/kg	1.5	--	1
tert-Butylbenzene	ND		ug/kg	5.8	--	1
o-Chlorotoluene	ND		ug/kg	5.8	--	1
p-Chlorotoluene	ND		ug/kg	5.8	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.8	--	1
Hexachlorobutadiene	ND		ug/kg	5.8	--	1
Isopropylbenzene	ND		ug/kg	1.5	--	1
p-Isopropyltoluene	ND		ug/kg	1.5	--	1
Naphthalene	ND		ug/kg	5.8	--	1
n-Propylbenzene	ND		ug/kg	1.5	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.8	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.8	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	5.8	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	5.8	--	1

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503333

Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-02 R	Date Collected:	02/23/15 09:40
Client ID:	CDM-2 5'-9'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	7.3	--	1
Diisopropyl Ether	ND		ug/kg	5.8	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	5.8	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	5.8	--	1
1,4-Dioxane	ND		ug/kg	58	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	**133**	Q	70-130
4-Bromofluorobenzene	**146**	Q	70-130
Dibromofluoromethane	107		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/25/15 09:25
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG764742-3					
Methylene chloride	ND		ug/kg	10	--
1,1-Dichloroethane	ND		ug/kg	1.5	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	3.5	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.5	--
Tetrachloroethene	ND		ug/kg	1.0	--
Chlorobenzene	ND		ug/kg	1.0	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	1.0	--
Bromodichloromethane	ND		ug/kg	1.0	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	1.0	--
1,3-Dichloropropene, Total	ND		ug/kg	1.0	--
1,1-Dichloropropene	ND		ug/kg	4.0	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	--
Benzene	ND		ug/kg	1.0	--
Toluene	ND		ug/kg	1.5	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	2.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	1.0	--

Project Name: KING OPEN SCHOOL
Lab Number: L1503333
Project Number: 0139-107911
Report Date: 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/25/15 09:25
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG764742-3					
1,2-Dichlorobenzene	ND		ug/kg	4.0	--
1,3-Dichlorobenzene	ND		ug/kg	4.0	--
1,4-Dichlorobenzene	ND		ug/kg	4.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	2.0	--
Xylenes, Total	ND		ug/kg	2.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	4.0	--
1,2,3-Trichloropropane	ND		ug/kg	4.0	--
Styrene	ND		ug/kg	2.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	36	--
Carbon disulfide	ND		ug/kg	4.0	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	4.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	5.0	--
1,2-Dibromoethane	ND		ug/kg	4.0	--
1,3-Dichloropropane	ND		ug/kg	4.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	--
Bromobenzene	ND		ug/kg	5.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	4.0	--
o-Chlorotoluene	ND		ug/kg	4.0	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/25/15 09:25
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG764742-3					
p-Chlorotoluene	ND		ug/kg	4.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	4.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	4.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	4.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	4.0	--
Diethyl ether	ND		ug/kg	5.0	--
Diisopropyl Ether	ND		ug/kg	4.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	4.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	4.0	--
1,4-Dioxane	ND		ug/kg	40	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	102		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/26/15 11:08
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 5035 High - Westborough Lab for sample(s):				01	Batch: WG764995-3
Methylene chloride	ND		ug/kg	500	--
1,1-Dichloroethane	ND		ug/kg	75	--
Chloroform	ND		ug/kg	75	--
Carbon tetrachloride	ND		ug/kg	50	--
1,2-Dichloropropane	ND		ug/kg	180	--
Dibromochloromethane	ND		ug/kg	50	--
1,1,2-Trichloroethane	ND		ug/kg	75	--
Tetrachloroethene	ND		ug/kg	50	--
Chlorobenzene	ND		ug/kg	50	--
Trichlorofluoromethane	ND		ug/kg	200	--
1,2-Dichloroethane	ND		ug/kg	50	--
1,1,1-Trichloroethane	ND		ug/kg	50	--
Bromodichloromethane	ND		ug/kg	50	--
trans-1,3-Dichloropropene	ND		ug/kg	50	--
cis-1,3-Dichloropropene	ND		ug/kg	50	--
1,3-Dichloropropene, Total	ND		ug/kg	50	--
1,1-Dichloropropene	ND		ug/kg	200	--
Bromoform	ND		ug/kg	200	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	50	--
Benzene	ND		ug/kg	50	--
Toluene	ND		ug/kg	75	--
Ethylbenzene	ND		ug/kg	50	--
Chloromethane	ND		ug/kg	200	--
Bromomethane	ND		ug/kg	100	--
Vinyl chloride	ND		ug/kg	100	--
Chloroethane	ND		ug/kg	100	--
1,1-Dichloroethene	ND		ug/kg	50	--
trans-1,2-Dichloroethene	ND		ug/kg	75	--
Trichloroethene	ND		ug/kg	50	--

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/26/15 11:08
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 5035 High - Westborough Lab for sample(s): 01 Batch: WG764995-3					
1,2-Dichlorobenzene	ND		ug/kg	200	--
1,3-Dichlorobenzene	ND		ug/kg	200	--
1,4-Dichlorobenzene	ND		ug/kg	200	--
Methyl tert butyl ether	ND		ug/kg	100	--
p/m-Xylene	ND		ug/kg	100	--
o-Xylene	ND		ug/kg	100	--
Xylenes, Total	ND		ug/kg	100	--
cis-1,2-Dichloroethene	ND		ug/kg	50	--
1,2-Dichloroethene, Total	ND		ug/kg	50	--
Dibromomethane	ND		ug/kg	200	--
1,2,3-Trichloropropane	ND		ug/kg	200	--
Styrene	ND		ug/kg	100	--
Dichlorodifluoromethane	ND		ug/kg	500	--
Acetone	ND		ug/kg	1800	--
Carbon disulfide	ND		ug/kg	200	--
Methyl ethyl ketone	ND		ug/kg	500	--
Methyl isobutyl ketone	ND		ug/kg	500	--
2-Hexanone	ND		ug/kg	500	--
Bromochloromethane	ND		ug/kg	200	--
Tetrahydrofuran	ND		ug/kg	200	--
2,2-Dichloropropane	ND		ug/kg	250	--
1,2-Dibromoethane	ND		ug/kg	200	--
1,3-Dichloropropane	ND		ug/kg	200	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	50	--
Bromobenzene	ND		ug/kg	250	--
n-Butylbenzene	ND		ug/kg	50	--
sec-Butylbenzene	ND		ug/kg	50	--
tert-Butylbenzene	ND		ug/kg	200	--
o-Chlorotoluene	ND		ug/kg	200	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/26/15 11:08
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 5035 High - Westborough Lab for sample(s): 01 Batch: WG764995-3					
p-Chlorotoluene	ND		ug/kg	200	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	200	--
Hexachlorobutadiene	ND		ug/kg	200	--
Isopropylbenzene	ND		ug/kg	50	--
p-Isopropyltoluene	ND		ug/kg	50	--
Naphthalene	ND		ug/kg	200	--
n-Propylbenzene	ND		ug/kg	50	--
1,2,3-Trichlorobenzene	ND		ug/kg	200	--
1,2,4-Trichlorobenzene	ND		ug/kg	200	--
1,3,5-Trimethylbenzene	ND		ug/kg	200	--
1,2,4-Trimethylbenzene	ND		ug/kg	200	--
Diethyl ether	ND		ug/kg	250	--
Diisopropyl Ether	ND		ug/kg	200	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	200	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	200	--
1,4-Dioxane	ND		ug/kg	5000	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	103		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	102		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503333
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG764742-1 WG764742-2								
Methylene chloride	97		97		70-130	0		20
1,1-Dichloroethane	102		99		70-130	3		20
Chloroform	104		102		70-130	2		20
Carbon tetrachloride	103		98		70-130	5		20
1,2-Dichloropropane	108		105		70-130	3		20
Dibromochloromethane	105		105		70-130	0		20
1,1,2-Trichloroethane	105		104		70-130	1		20
Tetrachloroethene	108		106		70-130	2		20
Chlorobenzene	106		106		70-130	0		20
Trichlorofluoromethane	98		92		70-130	6		20
1,2-Dichloroethane	102		102		70-130	0		20
1,1,1-Trichloroethane	103		99		70-130	4		20
Bromodichloromethane	107		105		70-130	2		20
trans-1,3-Dichloropropene	105		105		70-130	0		20
cis-1,3-Dichloropropene	107		105		70-130	2		20
1,1-Dichloropropene	104		99		70-130	5		20
Bromoform	104		102		70-130	2		20
1,1,2,2-Tetrachloroethane	105		100		70-130	5		20
Benzene	104		100		70-130	4		20
Toluene	104		103		70-130	1		20
Ethylbenzene	112		110		70-130	2		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG764742-1 WG764742-2								
Chloromethane	94		71		70-130	**28**	Q	20
Bromomethane	92		89		70-130	3		20
Vinyl chloride	94		88		70-130	7		20
Chloroethane	108		100		70-130	8		20
1,1-Dichloroethene	87		80		70-130	8		20
trans-1,2-Dichloroethene	99		96		70-130	3		20
Trichloroethene	107		103		70-130	4		20
1,2-Dichlorobenzene	109		106		70-130	3		20
1,3-Dichlorobenzene	112		109		70-130	3		20
1,4-Dichlorobenzene	109		108		70-130	1		20
Methyl tert butyl ether	100		97		70-130	3		20
p/m-Xylene	115		112		70-130	3		20
o-Xylene	112		111		70-130	1		20
cis-1,2-Dichloroethene	103		100		70-130	3		20
Dibromomethane	100		98		70-130	2		20
1,2,3-Trichloropropane	105		102		70-130	3		20
Styrene	111		111		70-130	0		20
Dichlorodifluoromethane	81		73		70-130	10		20
Acetone	**137**	Q	117		70-130	16		20
Carbon disulfide	90		79		70-130	13		20
Methyl ethyl ketone	108		98		70-130	10		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1503333
Project Number: 0139-107911
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG764742-1 WG764742-2								
Methyl isobutyl ketone	108		101		70-130	7		20
2-Hexanone	108		99		70-130	9		20
Bromochloromethane	102		99		70-130	3		20
Tetrahydrofuran	106		93		70-130	13		20
2,2-Dichloropropane	102		98		70-130	4		20
1,2-Dibromoethane	101		100		70-130	1		20
1,3-Dichloropropane	106		104		70-130	2		20
1,1,1,2-Tetrachloroethane	107		108		70-130	1		20
Bromobenzene	107		105		70-130	2		20
n-Butylbenzene	124		118		70-130	5		20
sec-Butylbenzene	114		109		70-130	4		20
tert-Butylbenzene	112		108		70-130	4		20
o-Chlorotoluene	110		108		70-130	2		20
p-Chlorotoluene	113		110		70-130	3		20
1,2-Dibromo-3-chloropropane	99		94		70-130	5		20
Hexachlorobutadiene	111		105		70-130	6		20
Isopropylbenzene	112		108		70-130	4		20
p-Isopropyltoluene	116		113		70-130	3		20
Naphthalene	99		95		70-130	4		20
n-Propylbenzene	116		112		70-130	4		20
1,2,3-Trichlorobenzene	107		104		70-130	3		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1503333
Project Number: 0139-107911
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG764742-1 WG764742-2								
1,2,4-Trichlorobenzene	114		111		70-130	3		20
1,3,5-Trimethylbenzene	115		111		70-130	4		20
1,2,4-Trimethylbenzene	114		111		70-130	3		20
Diethyl ether	106		104		70-130	2		20
Diisopropyl Ether	108		106		70-130	2		20
Ethyl-Tert-Butyl-Ether	103		101		70-130	2		20
Tertiary-Amyl Methyl Ether	101		99		70-130	2		20
1,4-Dioxane	101		92		70-130	9		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	100		98		70-130
Toluene-d8	101		101		70-130
4-Bromofluorobenzene	104		101		70-130
Dibromofluoromethane	102		100		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG764995-1 WG764995-2								
Methylene chloride	102		100		70-130	2		20
1,1-Dichloroethane	110		108		70-130	2		20
Chloroform	110		110		70-130	0		20
Carbon tetrachloride	118		117		70-130	1		20
1,2-Dichloropropane	113		112		70-130	1		20
Dibromochloromethane	108		111		70-130	3		20
1,1,2-Trichloroethane	109		110		70-130	1		20
Tetrachloroethene	120		116		70-130	3		20
Chlorobenzene	112		111		70-130	1		20
Trichlorofluoromethane	121		115		70-130	5		20
1,2-Dichloroethane	108		111		70-130	3		20
1,1,1-Trichloroethane	115		114		70-130	1		20
Bromodichloromethane	112		113		70-130	1		20
trans-1,3-Dichloropropene	110		110		70-130	0		20
cis-1,3-Dichloropropene	112		112		70-130	0		20
1,1-Dichloropropene	117		114		70-130	3		20
Bromoform	104		111		70-130	7		20
1,1,2,2-Tetrachloroethane	106		109		70-130	3		20
Benzene	111		108		70-130	3		20
Toluene	111		108		70-130	3		20
Ethylbenzene	117		114		70-130	3		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG764995-1 WG764995-2								
Chloromethane	106		101		70-130	5		20
Bromomethane	92		91		70-130	1		20
Vinyl chloride	110		104		70-130	6		20
Chloroethane	122		115		70-130	6		20
1,1-Dichloroethene	96		97		70-130	1		20
trans-1,2-Dichloroethene	109		106		70-130	3		20
Trichloroethene	116		114		70-130	2		20
1,2-Dichlorobenzene	111		111		70-130	0		20
1,3-Dichlorobenzene	115		114		70-130	1		20
1,4-Dichlorobenzene	113		111		70-130	2		20
Methyl tert butyl ether	103		105		70-130	2		20
p/m-Xylene	120		116		70-130	3		20
o-Xylene	118		114		70-130	3		20
cis-1,2-Dichloroethene	110		108		70-130	2		20
Dibromomethane	105		107		70-130	2		20
1,2,3-Trichloropropane	107		110		70-130	3		20
Styrene	117		114		70-130	3		20
Dichlorodifluoromethane	99		96		70-130	3		20
Acetone	103		94		70-130	9		20
Carbon disulfide	94		99		70-130	5		20
Methyl ethyl ketone	96		96		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503333
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG764995-1 WG764995-2								
Methyl isobutyl ketone	108		113		70-130	5		20
2-Hexanone	98		102		70-130	4		20
Bromochloromethane	108		107		70-130	1		20
Tetrahydrofuran	110		111		70-130	1		20
2,2-Dichloropropane	115		110		70-130	4		20
1,2-Dibromoethane	103		105		70-130	2		20
1,3-Dichloropropane	109		110		70-130	1		20
1,1,1,2-Tetrachloroethane	113		112		70-130	1		20
Bromobenzene	108		109		70-130	1		20
n-Butylbenzene	**131**	Q	127		70-130	3		20
sec-Butylbenzene	123		119		70-130	3		20
tert-Butylbenzene	118		116		70-130	2		20
o-Chlorotoluene	115		113		70-130	2		20
p-Chlorotoluene	116		115		70-130	1		20
1,2-Dibromo-3-chloropropane	94		105		70-130	11		20
Hexachlorobutadiene	120		112		70-130	7		20
Isopropylbenzene	119		117		70-130	2		20
p-Isopropyltoluene	123		120		70-130	2		20
Naphthalene	96		100		70-130	4		20
n-Propylbenzene	123		120		70-130	2		20
1,2,3-Trichlorobenzene	107		107		70-130	0		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 5035 High - Westborough Lab Associated sample(s): 01 Batch: WG764995-1 WG764995-2								
1,2,4-Trichlorobenzene	114		112		70-130	2		20
1,3,5-Trimethylbenzene	118		117		70-130	1		20
1,2,4-Trimethylbenzene	117		116		70-130	1		20
Diethyl ether	110		108		70-130	2		20
Diisopropyl Ether	115		116		70-130	1		20
Ethyl-Tert-Butyl-Ether	108		109		70-130	1		20
Tertiary-Amyl Methyl Ether	106		107		70-130	1		20
1,4-Dioxane	93		97		70-130	4		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	103		102		70-130
Toluene-d8	101		99		70-130
4-Bromofluorobenzene	100		102		70-130
Dibromofluoromethane	102		103		70-130

SEMIVOLATILES

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333

Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/24/15 08:10
Analytical Date:	02/24/15 20:58		
Analyst:	AS		
Percent Solids:	78%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	170	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	210	--	1
Hexachlorobenzene	ND		ug/kg	130	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	190	--	1
2-Chloronaphthalene	ND		ug/kg	210	--	1
1,2-Dichlorobenzene	ND		ug/kg	210	--	1
1,3-Dichlorobenzene	ND		ug/kg	210	--	1
1,4-Dichlorobenzene	ND		ug/kg	210	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	210	--	1
2,4-Dinitrotoluene	ND		ug/kg	210	--	1
2,6-Dinitrotoluene	ND		ug/kg	210	--	1
Azobenzene	ND		ug/kg	210	--	1
Fluoranthene	1100		ug/kg	130	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	210	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	250	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	230	--	1
Hexachlorobutadiene	ND		ug/kg	210	--	1
Hexachloroethane	ND		ug/kg	170	--	1
Isophorone	ND		ug/kg	190	--	1
Naphthalene	ND		ug/kg	210	--	1
Nitrobenzene	ND		ug/kg	190	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	210	--	1
Butyl benzyl phthalate	ND		ug/kg	210	--	1
Di-n-butylphthalate	ND		ug/kg	210	--	1
Di-n-octylphthalate	ND		ug/kg	210	--	1
Diethyl phthalate	ND		ug/kg	210	--	1
Dimethyl phthalate	ND		ug/kg	210	--	1
Benzo(a)anthracene	1300		ug/kg	130	--	1
Benzo(a)pyrene	3400		ug/kg	170	--	1
Benzo(b)fluoranthene	3500		ug/kg	130	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	1200		ug/kg	130	--	1
Chrysene	1200		ug/kg	130	--	1
Acenaphthylene	ND		ug/kg	170	--	1
Anthracene	190		ug/kg	130	--	1
Benzo(ghi)perylene	4500		ug/kg	170	--	1
Fluorene	ND		ug/kg	210	--	1
Phenanthrene	670		ug/kg	130	--	1
Dibenzo(a,h)anthracene	820		ug/kg	130	--	1
Indeno(1,2,3-cd)Pyrene	4500		ug/kg	170	--	1
Pyrene	1100		ug/kg	130	--	1
Aniline	ND		ug/kg	250	--	1
4-Chloroaniline	ND		ug/kg	210	--	1
Dibenzofuran	ND		ug/kg	210	--	1
2-Methylnaphthalene	ND		ug/kg	250	--	1
Acetophenone	ND		ug/kg	210	--	1
2,4,6-Trichlorophenol	ND		ug/kg	130	--	1
2-Chlorophenol	ND		ug/kg	210	--	1
2,4-Dichlorophenol	ND		ug/kg	190	--	1
2,4-Dimethylphenol	ND		ug/kg	210	--	1
2-Nitrophenol	ND		ug/kg	460	--	1
4-Nitrophenol	ND		ug/kg	300	--	1
2,4-Dinitrophenol	ND		ug/kg	1000	--	1
Pentachlorophenol	ND		ug/kg	420	--	1
Phenol	ND		ug/kg	210	--	1
2-Methylphenol	ND		ug/kg	210	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	300	--	1
2,4,5-Trichlorophenol	ND		ug/kg	210	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	77		30-130
Phenol-d6	82		30-130
Nitrobenzene-d5	79		30-130
2-Fluorobiphenyl	87		30-130
2,4,6-Tribromophenol	80		30-130
4-Terphenyl-d14	86		30-130

Project Name: KING OPEN SCHOOL | **Lab Number:** L1503333

Project Number: 0139-107911 | **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-02	Date Collected:	02/23/15 09:40
Client ID:	CDM-2 5'-9'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/24/15 08:10
Analytical Date:	02/24/15 21:24		
Analyst:	AS		
Percent Solids:	78%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	170	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	210	--	1
Hexachlorobenzene	ND		ug/kg	120	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	190	--	1
2-Chloronaphthalene	ND		ug/kg	210	--	1
1,2-Dichlorobenzene	ND		ug/kg	210	--	1
1,3-Dichlorobenzene	ND		ug/kg	210	--	1
1,4-Dichlorobenzene	ND		ug/kg	210	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	210	--	1
2,4-Dinitrotoluene	ND		ug/kg	210	--	1
2,6-Dinitrotoluene	ND		ug/kg	210	--	1
Azobenzene	ND		ug/kg	210	--	1
Fluoranthene	ND		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	210	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	250	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	220	--	1
Hexachlorobutadiene	ND		ug/kg	210	--	1
Hexachloroethane	ND		ug/kg	170	--	1
Isophorone	ND		ug/kg	190	--	1
Naphthalene	ND		ug/kg	210	--	1
Nitrobenzene	ND		ug/kg	190	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	210	--	1
Butyl benzyl phthalate	ND		ug/kg	210	--	1
Di-n-butylphthalate	ND		ug/kg	210	--	1
Di-n-octylphthalate	ND		ug/kg	210	--	1
Diethyl phthalate	ND		ug/kg	210	--	1
Dimethyl phthalate	ND		ug/kg	210	--	1
Benzo(a)anthracene	ND		ug/kg	120	--	1
Benzo(a)pyrene	ND		ug/kg	170	--	1
Benzo(b)fluoranthene	ND		ug/kg	120	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-02	Date Collected:	02/23/15 09:40
Client ID:	CDM-2 5'-9'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	ND		ug/kg	120	--	1
Chrysene	ND		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	170	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	ND		ug/kg	170	--	1
Fluorene	ND		ug/kg	210	--	1
Phenanthrene	ND		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	120	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	170	--	1
Pyrene	ND		ug/kg	120	--	1
Aniline	ND		ug/kg	250	--	1
4-Chloroaniline	ND		ug/kg	210	--	1
Dibenzofuran	ND		ug/kg	210	--	1
2-Methylnaphthalene	ND		ug/kg	250	--	1
Acetophenone	ND		ug/kg	210	--	1
2,4,6-Trichlorophenol	ND		ug/kg	120	--	1
2-Chlorophenol	ND		ug/kg	210	--	1
2,4-Dichlorophenol	ND		ug/kg	190	--	1
2,4-Dimethylphenol	ND		ug/kg	210	--	1
2-Nitrophenol	ND		ug/kg	450	--	1
4-Nitrophenol	ND		ug/kg	290	--	1
2,4-Dinitrophenol	ND		ug/kg	1000	--	1
Pentachlorophenol	ND		ug/kg	420	--	1
Phenol	ND		ug/kg	210	--	1
2-Methylphenol	ND		ug/kg	210	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	300	--	1
2,4,5-Trichlorophenol	ND		ug/kg	210	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	86		30-130
Phenol-d6	91		30-130
Nitrobenzene-d5	87		30-130
2-Fluorobiphenyl	91		30-130
2,4,6-Tribromophenol	99		30-130
4-Terphenyl-d14	85		30-130

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/24/15 18:01
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 02/24/15 08:10

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG764431-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	98	--
Bis(2-chloroethyl)ether	ND		ug/kg	150	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	160	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	160	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	98	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	130	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/24/15 18:01
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 02/24/15 08:10

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG764431-1					
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	98	--
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	200	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	98	--
2-Chlorophenol	ND		ug/kg	160	--
2,4-Dichlorophenol	ND		ug/kg	150	--
2,4-Dimethylphenol	ND		ug/kg	160	--
2-Nitrophenol	ND		ug/kg	350	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	790	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--

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Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503333
Report Date: 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/24/15 18:01
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 02/24/15 08:10

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG764431-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	88		30-130
Phenol-d6	88		30-130
Nitrobenzene-d5	87		30-130
2-Fluorobiphenyl	87		30-130
2,4,6-Tribromophenol	99		30-130
4-Terphenyl-d14	90		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG764431-2 WG764431-3								
Acenaphthene	97		98		40-140	1		30
1,2,4-Trichlorobenzene	97		94		40-140	3		30
Hexachlorobenzene	99		98		40-140	1		30
Bis(2-chloroethyl)ether	91		91		40-140	0		30
2-Chloronaphthalene	99		98		40-140	1		30
1,2-Dichlorobenzene	90		91		40-140	1		30
1,3-Dichlorobenzene	90		90		40-140	0		30
1,4-Dichlorobenzene	92		91		40-140	1		30
3,3'-Dichlorobenzidine	73		63		40-140	15		30
2,4-Dinitrotoluene	104		103		40-140	1		30
2,6-Dinitrotoluene	102		100		40-140	2		30
Azobenzene	105		103		40-140	2		30
Fluoranthene	104		103		40-140	1		30
4-Bromophenyl phenyl ether	102		106		40-140	4		30
Bis(2-chloroisopropyl)ether	90		92		40-140	2		30
Bis(2-chloroethoxy)methane	91		92		40-140	1		30
Hexachlorobutadiene	97		95		40-140	2		30
Hexachloroethane	92		92		40-140	0		30
Isophorone	95		93		40-140	2		30
Naphthalene	97		95		40-140	2		30
Nitrobenzene	101		99		40-140	2		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG764431-2 WG764431-3								
Bis(2-Ethylhexyl)phthalate	105		106		40-140	1		30
Butyl benzyl phthalate	111		105		40-140	6		30
Di-n-butylphthalate	107		105		40-140	2		30
Di-n-octylphthalate	113		111		40-140	2		30
Diethyl phthalate	104		102		40-140	2		30
Dimethyl phthalate	100		100		40-140	0		30
Benzo(a)anthracene	104		106		40-140	2		30
Benzo(a)pyrene	107		109		40-140	2		30
Benzo(b)fluoranthene	102		106		40-140	4		30
Benzo(k)fluoranthene	108		110		40-140	2		30
Chrysene	99		101		40-140	2		30
Acenaphthylene	99		100		40-140	1		30
Anthracene	105		107		40-140	2		30
Benzo(ghi)perylene	106		109		40-140	3		30
Fluorene	101		100		40-140	1		30
Phenanthrene	102		103		40-140	1		30
Dibenzo(a,h)anthracene	105		110		40-140	5		30
Indeno(1,2,3-cd)Pyrene	109		112		40-140	3		30
Pyrene	108		104		40-140	4		30
Aniline	61		52		40-140	16		30
4-Chloroaniline	86		80		40-140	7		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503333
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG764431-2 WG764431-3								
Dibenzofuran	100		100		40-140	0		30
2-Methylnaphthalene	96		95		40-140	1		30
Acetophenone	98		100		40-140	2		30
2,4,6-Trichlorophenol	108		103		30-130	5		30
2-Chlorophenol	96		100		30-130	4		30
2,4-Dichlorophenol	104		105		30-130	1		30
2,4-Dimethylphenol	103		106		30-130	3		30
2-Nitrophenol	97		98		30-130	1		30
4-Nitrophenol	**145**	Q	**148**	Q	30-130	2		30
2,4-Dinitrophenol	92		84		30-130	9		30
Pentachlorophenol	113		109		30-130	4		30
Phenol	92		95		30-130	3		30
2-Methylphenol	100		101		30-130	1		30
3-Methylphenol/4-Methylphenol	100		101		30-130	1		30
2,4,5-Trichlorophenol	109		107		30-130	2		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL

Project Number: 0139-107911

Lab Number: L1503333

Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG764431-2 WG764431-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	100		101		30-130
Phenol-d6	100		100		30-130
Nitrobenzene-d5	98		97		30-130
2-Fluorobiphenyl	96		94		30-130
2,4,6-Tribromophenol	109		107		30-130
4-Terphenyl-d14	99		94		30-130

PETROLEUM HYDROCARBONS

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503333
Project Number:	0139-107911	**Report Date:**	02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/24/15 21:50
Analytical Date:	02/26/15 14:18	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/25/15
Percent Solids:	78%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	8.14	--	1
C19-C36 Aliphatics	13.6		mg/kg	8.14	--	1
C11-C22 Aromatics	62.9		mg/kg	8.14	--	1
C11-C22 Aromatics, Adjusted	40.4		mg/kg	8.14	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	77		40-140
o-Terphenyl	68		40-140
2-Fluorobiphenyl	68		40-140
2-Bromonaphthalene	71		40-140

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-02	Date Collected:	02/23/15 09:40
Client ID:	CDM-2 5'-9'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/24/15 21:50
Analytical Date:	02/25/15 18:49	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/25/15
Percent Solids:	78%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	8.12	--	1
C19-C36 Aliphatics	14.7		mg/kg	8.12	--	1
C11-C22 Aromatics	29.7		mg/kg	8.12	--	1
C11-C22 Aromatics, Adjusted	28.0		mg/kg	8.12	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	75		40-140
o-Terphenyl	83		40-140
2-Fluorobiphenyl	86		40-140
2-Bromonaphthalene	88		40-140

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 02/25/15 13:30
Analyst: SR

Extraction Method: EPA 3546
Extraction Date: 02/24/15 21:50
Cleanup Method: EPH-04-1
Cleanup Date: 02/25/15

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG764593-1					
C9-C18 Aliphatics	ND		mg/kg	6.54	--
C19-C36 Aliphatics	ND		mg/kg	6.54	--
C11-C22 Aromatics	ND		mg/kg	6.54	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.54	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	67		40-140
o-Terphenyl	60		40-140
2-Fluorobiphenyl	66		40-140
2-Bromonaphthalene	71		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG764593-2 WG764593-3								
C9-C18 Aliphatics	58		56		40-140	4		25
C19-C36 Aliphatics	69		68		40-140	1		25
C11-C22 Aromatics	72		64		40-140	12		25
Naphthalene	73		57		40-140	25		25
2-Methylnaphthalene	77		62		40-140	22		25
Acenaphthylene	62		54		40-140	14		25
Acenaphthene	74		62		40-140	18		25
Fluorene	72		61		40-140	17		25
Phenanthrene	75		64		40-140	16		25
Anthracene	78		70		40-140	11		25
Fluoranthene	77		66		40-140	15		25
Pyrene	79		69		40-140	14		25
Benzo(a)anthracene	72		63		40-140	13		25
Chrysene	78		68		40-140	14		25
Benzo(b)fluoranthene	74		65		40-140	13		25
Benzo(k)fluoranthene	74		67		40-140	10		25
Benzo(a)pyrene	67		61		40-140	9		25
Indeno(1,2,3-cd)Pyrene	59		53		40-140	11		25
Dibenzo(a,h)anthracene	67		60		40-140	11		25
Benzo(ghi)perylene	70		62		40-140	12		25
Nonane (C9)	50		48		30-140	4		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1503333
Project Number: 0139-107911
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG764593-2 WG764593-3								
Decane (C10)	57		54		40-140	5		25
Dodecane (C12)	64		62		40-140	3		25
Tetradecane (C14)	67		65		40-140	3		25
Hexadecane (C16)	70		69		40-140	1		25
Octadecane (C18)	74		72		40-140	3		25
Nonadecane (C19)	76		74		40-140	3		25
Eicosane (C20)	77		75		40-140	3		25
Docosane (C22)	78		77		40-140	1		25
Tetracosane (C24)	78		77		40-140	1		25
Hexacosane (C26)	79		78		40-140	1		25
Octacosane (C28)	80		79		40-140	1		25
Triacontane (C30)	82		81		40-140	1		25
Hexatriacontane (C36)	83		82		40-140	1		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	78		71		40-140
o-Terphenyl	76		71		40-140
2-Fluorobiphenyl	82		68		40-140
2-Bromonaphthalene	86		73		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

PCBS

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333

Project Number: 0139-107911 **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/24/15 09:30
Analytical Date:	02/25/15 08:10	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	02/24/15
Percent Solids:	78%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/24/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	41.7	--	1	A
Aroclor 1221	ND		ug/kg	41.7	--	1	A
Aroclor 1232	ND		ug/kg	41.7	--	1	A
Aroclor 1242	ND		ug/kg	41.7	--	1	A
Aroclor 1248	ND		ug/kg	41.7	--	1	A
Aroclor 1254	ND		ug/kg	41.7	--	1	A
Aroclor 1260	ND		ug/kg	41.7	--	1	A
Aroclor 1262	ND		ug/kg	41.7	--	1	A
Aroclor 1268	ND		ug/kg	41.7	--	1	A
PCBs, Total	ND		ug/kg	41.7	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	59		30-150	A
Decachlorobiphenyl	49		30-150	A
2,4,5,6-Tetrachloro-m-xylene	63		30-150	B
Decachlorobiphenyl	49		30-150	B

Project Name: KING OPEN SCHOOL | **Lab Number:** L1503333

Project Number: 0139-107911 | **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-02	Date Collected:	02/23/15 09:40
Client ID:	CDM-2 5'-9'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/25/15 17:40
Analytical Date:	02/26/15 06:03	Cleanup Method:	EPA 3665A
Analyst:	JT	Cleanup Date:	02/25/15
Percent Solids:	78%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/25/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	42.2	--	1	A
Aroclor 1221	ND		ug/kg	42.2	--	1	A
Aroclor 1232	ND		ug/kg	42.2	--	1	A
Aroclor 1242	ND		ug/kg	42.2	--	1	A
Aroclor 1248	ND		ug/kg	42.2	--	1	A
Aroclor 1254	ND		ug/kg	42.2	--	1	A
Aroclor 1260	ND		ug/kg	42.2	--	1	A
Aroclor 1262	ND		ug/kg	42.2	--	1	A
Aroclor 1268	ND		ug/kg	42.2	--	1	A
PCBs, Total	ND		ug/kg	42.2	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	61		30-150	A
Decachlorobiphenyl	57		30-150	A
2,4,5,6-Tetrachloro-m-xylene	64		30-150	B
Decachlorobiphenyl	65		30-150	B

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 02/24/15 19:08
Analyst: JW

Extraction Method: EPA 3546
Extraction Date: 02/24/15 09:30
Cleanup Method: EPA 3665A
Cleanup Date: 02/24/15
Cleanup Method: EPA 3660B
Cleanup Date: 02/24/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG764444-1						
Aroclor 1016	ND		ug/kg	31.7	--	A
Aroclor 1221	ND		ug/kg	31.7	--	A
Aroclor 1232	ND		ug/kg	31.7	--	A
Aroclor 1242	ND		ug/kg	31.7	--	A
Aroclor 1248	ND		ug/kg	31.7	--	A
Aroclor 1254	ND		ug/kg	31.7	--	A
Aroclor 1260	ND		ug/kg	31.7	--	A
Aroclor 1262	ND		ug/kg	31.7	--	A
Aroclor 1268	ND		ug/kg	31.7	--	A
PCBs, Total	ND		ug/kg	31.7	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	35		30-150	A
Decachlorobiphenyl	32		30-150	A
2,4,5,6-Tetrachloro-m-xylene	37		30-150	B
Decachlorobiphenyl	37		30-150	B

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 02/26/15 04:56
Analyst: JT

Extraction Method: EPA 3546
Extraction Date: 02/25/15 17:40
Cleanup Method: EPA 3665A
Cleanup Date: 02/25/15
Cleanup Method: EPA 3660B
Cleanup Date: 02/25/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 02 Batch: WG764844-1						
Aroclor 1016	ND		ug/kg	32.3	--	A
Aroclor 1221	ND		ug/kg	32.3	--	A
Aroclor 1232	ND		ug/kg	32.3	--	A
Aroclor 1242	ND		ug/kg	32.3	--	A
Aroclor 1248	ND		ug/kg	32.3	--	A
Aroclor 1254	ND		ug/kg	32.3	--	A
Aroclor 1260	ND		ug/kg	32.3	--	A
Aroclor 1262	ND		ug/kg	32.3	--	A
Aroclor 1268	ND		ug/kg	32.3	--	A
PCBs, Total	ND		ug/kg	32.3	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	85		30-150	A
Decachlorobiphenyl	86		30-150	A
2,4,5,6-Tetrachloro-m-xylene	92		30-150	B
Decachlorobiphenyl	100		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1503333
Project Number: 0139-107911
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG764444-2 WG764444-3									
Aroclor 1016	64		58		40-140	10		30	A
Aroclor 1260	64		57		40-140	12		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	62		60		30-150	A
Decachlorobiphenyl	57		54		30-150	A
2,4,5,6-Tetrachloro-m-xylene	67		63		30-150	B
Decachlorobiphenyl	68		65		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 02 Batch: WG764844-2 WG764844-3									
Aroclor 1016	70		69		40-140	1		30	A
Aroclor 1260	70		69		40-140	1		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	82		82		30-150	A
Decachlorobiphenyl	84		86		30-150	A
2,4,5,6-Tetrachloro-m-xylene	88		87		30-150	B
Decachlorobiphenyl	98		98		30-150	B

METALS

Project Name: KING OPEN SCHOOL

Project Number: 0139-107911

Lab Number: L1503333

Report Date: 02/27/15

SAMPLE RESULTS

Lab ID:	L1503333-01	Date Collected:	02/23/15 09:17
Client ID:	CDM-2 1'-5'	Date Received:	02/23/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	78%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	8.0		mg/kg	0.48	--	1	02/24/15 11:12	02/24/15 19:13	EPA 3050B	97,6010C	MG
Barium, Total	76		mg/kg	0.48	--	1	02/24/15 11:12	02/24/15 19:13	EPA 3050B	97,6010C	MG
Cadmium, Total	ND		mg/kg	0.48	--	1	02/24/15 11:12	02/24/15 19:13	EPA 3050B	97,6010C	MG
Chromium, Total	9.3		mg/kg	0.48	--	1	02/24/15 11:12	02/24/15 19:13	EPA 3050B	97,6010C	MG
Lead, Total	81		mg/kg	2.4	--	1	02/24/15 11:12	02/24/15 19:13	EPA 3050B	97,6010C	MG
Mercury, Total	0.631		mg/kg	0.087	--	1	02/24/15 07:13	02/24/15 13:59	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.4	--	1	02/24/15 11:12	02/24/15 19:13	EPA 3050B	97,6010C	MG
Silver, Total	ND		mg/kg	0.48	--	1	02/24/15 11:12	02/24/15 19:13	EPA 3050B	97,6010C	MG

Project Name: KING OPEN SCHOOL | **Lab Number:** L1503333
Project Number: 0139-107911 | **Report Date:** 02/27/15

SAMPLE RESULTS

Lab ID: L1503333-02 | Date Collected: 02/23/15 09:40
Client ID: CDM-2 5'-9' | Date Received: 02/23/15
Sample Location: CAMBRIDGE, MA | Field Prep: Not Specified
Matrix: Soil
Percent Solids: 78%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	2.7		mg/kg	0.50	--	1	02/24/15 11:12	02/24/15 19:17	EPA 3050B	97,6010C	MG
Barium, Total	24		mg/kg	0.50	--	1	02/24/15 11:12	02/24/15 19:17	EPA 3050B	97,6010C	MG
Cadmium, Total	ND		mg/kg	0.50	--	1	02/24/15 11:12	02/24/15 19:17	EPA 3050B	97,6010C	MG
Chromium, Total	7.7		mg/kg	0.50	--	1	02/24/15 11:12	02/24/15 19:17	EPA 3050B	97,6010C	MG
Lead, Total	14		mg/kg	2.5	--	1	02/24/15 11:12	02/24/15 19:17	EPA 3050B	97,6010C	MG
Mercury, Total	0.150		mg/kg	0.086	--	1	02/24/15 07:13	02/24/15 14:01	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.5	--	1	02/24/15 11:12	02/24/15 19:17	EPA 3050B	97,6010C	MG
Silver, Total	ND		mg/kg	0.50	--	1	02/24/15 11:12	02/24/15 19:17	EPA 3050B	97,6010C	MG

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG764385-1										
Mercury, Total	ND		mg/kg	0.083	--	1	02/24/15 07:13	02/24/15 13:49	97,7471B	MC

Prep Information

Digestion Method: EPA 7471B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG764483-1										
Arsenic, Total	ND		mg/kg	0.40	--	1	02/24/15 11:12	02/24/15 18:54	97,6010C	MG
Barium, Total	ND		mg/kg	0.40	--	1	02/24/15 11:12	02/24/15 18:54	97,6010C	MG
Cadmium, Total	ND		mg/kg	0.40	--	1	02/24/15 11:12	02/24/15 18:54	97,6010C	MG
Chromium, Total	ND		mg/kg	0.40	--	1	02/24/15 11:12	02/24/15 18:54	97,6010C	MG
Lead, Total	ND		mg/kg	2.0	--	1	02/24/15 11:12	02/24/15 18:54	97,6010C	MG
Selenium, Total	ND		mg/kg	2.0	--	1	02/24/15 11:12	02/24/15 18:54	97,6010C	MG
Silver, Total	ND		mg/kg	0.40	--	1	02/24/15 11:12	02/24/15 18:54	97,6010C	MG

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL | **Lab Number:** L1503333
Project Number: 0139-107911 | **Report Date:** 02/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG764385-2 WG764385-3 SRM Lot Number: D083-540								
Mercury, Total	113		120		75-126	6		30
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG764483-2 WG764483-3 SRM Lot Number: D083-540								
Arsenic, Total	98		98		78-122	0		30
Barium, Total	84		84		82-117	0		30
Cadmium, Total	90		90		82-118	0		30
Chromium, Total	87		89		79-121	2		30
Lead, Total	90		90		81-119	0		30
Selenium, Total	96		96		78-123	0		30
Silver, Total	94		94		74-125	0		30

INORGANICS
&
MISCELLANEOUS

Project Name: KING OPEN SCHOOL
Lab Number: L1503333
Project Number: 0139-107911
Report Date: 02/27/15

SAMPLE RESULTS

Lab ID: L1503333-01
Client ID: CDM-2 1'-5'
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Date Collected: 02/23/15 09:17
Date Received: 02/23/15
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	78.4		%	0.100	NA	1	-	02/23/15 20:49	30,2540G	RT

Project Name: KING OPEN SCHOOL

Project Number: 0139-107911

Lab Number: L1503333

Report Date: 02/27/15

SAMPLE RESULTS

Lab ID: L1503333-02
Client ID: CDM-2 5'-9'
Sample Location: CAMBRIDGE, MA
Matrix: Soil

Date Collected: 02/23/15 09:40
Date Received: 02/23/15
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	77.6		%	0.100	NA	1	-	02/23/15 20:49	30,2540G	RT

Lab Duplicate Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG764341-1 QC Sample: L1502748-02 Client ID: DUP Sample						
Solids, Total	62.0	62.6	%	1		20

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: 02/23/2015 18:43

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503333-01A	Vial MeOH preserved	A	N/A	4.4	Y	Absent	MCP-8260H-10(14),MCP-8260HLW-10(14)
L1503333-01B	Vial water preserved	A	N/A	4.4	Y	Absent	MCP-8260H-10(14),MCP-8260HLW-10(14)
L1503333-01C	Vial water preserved	A	N/A	4.4	Y	Absent	MCP-8260H-10(14),MCP-8260HLW-10(14)
L1503333-01D	Glass 250ml/8oz unpreserved	A	N/A	4.4	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1503333-01E	Glass 250ml/8oz unpreserved	A	N/A	4.4	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1503333-02A	Vial MeOH preserved	A	N/A	4.4	Y	Absent	MCP-8260HLW-10(14)
L1503333-02B	Vial water preserved	A	N/A	4.4	Y	Absent	MCP-8260HLW-10(14)
L1503333-02C	Vial water preserved	A	N/A	4.4	Y	Absent	MCP-8260HLW-10(14)
L1503333-02D	Glass 250ml/8oz unpreserved	A	N/A	4.4	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503333
Report Date: 02/27/15

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503333-02E	Glass 250ml/8oz unpreserved	A	N/A	4.4	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-PB-6010T-10(180)

256

*Values in parentheses indicate holding time in days

Project Name: KING OPEN SCHOOL **Lab Number:** L1503333
Project Number: 0139-107911 **Report Date:** 02/27/15

GLOSSARY

Acronyms

EDL - Estimated 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 EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

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

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

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 ten times (10x) 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. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

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.

Report Format: Data Usability Report

Data Qualifiers

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 lower value for the two columns 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.
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.
S	- Analytical results are from modified screening analysis.
J	- Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
ND	- Not detected at the reporting limit (RL) for the sample.

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.

98 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, 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.

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: 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
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE ____ OF ____

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: 2/23/15

ALPHA Job #: L1503333

Project Information

Project Name: King Open School
Project Location: Cambridge, MA
Project #: 0589-107911
Project Manager: Jay McMullen
ALPHA Quote #:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☒ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #:

Client Information

Client: CDMSmith
Address: 50 Hampshire St Cambridge, MA
Phone: 617 4526419
Fax:
Email: wrec@cdmsmith.com

☐ These samples have been previously analyzed by Alpha

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: 3/2/15 Time:

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)

RUN TCLP if 20x Rule exceeded

ANALYSIS: VOC (LL), SVOC +PAH, Metals RCRA8 ~~RCRA 15~~, EPH Ranges, PCB

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOC (LL)	SVOC +PAH	Metals RCRA8	EPH Ranges	PCB	Sample Specific Comments	Total # Bottles
3333 -01	CDM-2 1'-5'	2/23/15	9:17	S	EW	X	X	X	X	X		
-02	CDM-2 5'-9'	2/23/15	9:40	S	EW	X	X	X	X	X		

	VOC (LL)	SVOC +PAH	Metals	EPH	PCB
Container Type	V	A	A	A	A
Preservative	A	F	A	A	A

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

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
Elizabeth Wee	2/23/15 13:50	[illegible] AAL	2/23/15 1350
[illegible] AAL	2/23/15 17:25	[illegible]	2/23/15 17:25

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 ____ OF ____

Date Rec'd In Lab: 2/23/15

ALPHA Job #: L1503333

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: CDM Smith
Address: 50 Hampshire St Cambridge, MA
Phone: 617 452 6419
Fax:
Email: wreed@cdmsmith.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: King Open School
Project Location: Cambridge, MA
Project #: 0589-107911
Project Manager: Jay McMullen
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)
Date Due: 3/2/15 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)

run TCLP if 20x Rule exceeded

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	VOC (MCP)	SVOC (PAH)	Metals RCRA 8	EPH Ranges	PCB	Sample Specific Comments	TOTAL # BOTTLES
3333-01	CDM-2 1'-5'	2/23/15	9:17	S	EW	X	X	X	X	X		
-02	CDM-2 5'-9'	2/23/15	9:40	S	EW	X	X	X	X	X		
Container Type						V	A	A	A	A		
Preservative						A	F	A	A	A		

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP or CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
Elizabeth Wea[illegible]	2/23/15 13:50	[illegible] AAL	2/23/15 1350
[illegible] AAL	2/23/15 1725	[illegible]	2/23/15 17:25

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)

7A
Volatile Organics CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503333

Instrument ID: Voa104.i   Calibration Date: 25-FEB-2015 Time: 07:40

Lab File ID: 0225A01   Init. Calib. Date(s): 14-NOV-2   14-NOV-2

Sample No: 8260 CCAL   Init. Calib. Times : 18:34   21:39

Compound	RRF (mean)	RRF	MIN RRF	%D	MAX %D	
dichlorodifluoromethane	.16305	.13178	.1	-19	20	
chloromethane	.31614	.29885	.1	-5	20	
vinyl chloride	.2743	.25908	.1	-6	20	
bromomethane	100	92.217	.1	-8	20	
chloroethane	.13774	.14819	.1	8	20	
trichlorofluoromethane	.27387	.26944	.1	-2	20	
ethyl ether	.09232	.09793	.05	6	20	
1,1,-dichloroethene	.2177	.18956	.1	-13	20	
carbon disulfide	.70085	.63101	.1	-10	20	
methylene chloride	.26137	.25305	.1	-3	20	
acetone	100	137	.1	37	20	F
trans-1,2-dichloroethene	.25442	.25081	.1	-1	20	
methyl tert butyl ether	.55986	.55714	.1	0	20	
Diisopropyl Ether	.94156	1.0219	.05	9	20	
1,1-dichloroethane	.49595	.50744	.2	2	20	
Ethyl-Tert-Butyl-Ether	.82014	.84477	.05	3	20	
cis-1,2-dichloroethene	.28074	.28916	.1	3	20	
2,2-dichloropropane	.35677	.36423	.05	2	20	
bromochloromethane	.12861	.13087	.05	2	20	
chloroform	.44837	.4656	.2	4	20	
carbontetrachloride	.32832	.33754	.1	3	20	
tetrahydrofuran	.06814	.07245	.05	6	20	
1,1,1-trichloroethane	.37681	.38965	.1	3	20	
2-butanone	.09192	.09899	.1	8	20	F
1,1-dichloropropene	.33481	.34772	.05	4	20	
benzene	.97656	1.0150	.5	4	20	
Tertiary-Amyl Methyl Ether	.62875	.63546	.05	1	20	
1,2-dichloroethane	.30244	.31004	.1	3	20	
trichloroethene	.264	.28242	.2	7	20	
dibromomethane	.14205	.14263	.05	0	20	
1,2-dichloropropane	.27957	.30205	.1	8	20	
bromodichloromethane	.33098	.35502	.2	7	20	
1,4-dioxane	.00202	.00204	.05	1	20	F
cis-1,3-dichloropropene	.39239	.42082	.2	7	20	
toluene	.87644	.91482	.4	4	20	
tetrachloroethene	.36363	.3913	.2	8	20	
4-methyl-2-pentanone	.07517	.08102	.1	8	20	F
trans-1,3-dichloropropene	.46349	.48684	.1	5	20	

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7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503333

Instrument ID: Voa104.i   Calibration Date: 25-FEB-2015 Time: 07:40

Lab File ID: 0225A01   Init. Calib. Date(s): 14-NOV-2   14-NOV-2

Sample No: 8260 CCAL   Init. Calib. Times : 18:34   21:39

Compound	$\overline{RRF}$	RRF	MIN RRF	%D	MAX %D	
1,1,2-trichloroethane	.23224	.24315	.1	5	20	
chlorodibromomethane	.34856	.3652	.1	5	20	
1,3-dichloropropane	.45928	.4854	.05	6	20	
1,2-dibromoethane	.28223	.28453	.1	1	20	
2-hexanone	.19278	.20817	.1	8	20	
chlorobenzene	1.0010	1.0636	.5	6	20	
ethyl benzene	1.6393	1.8285	.1	12	20	
1,1,1,2-tetrachloroethane	.3581	.38468	.05	7	20	
p/m xylene	.63448	.72738	.1	15	20	
o xylene	.6125	.68422	.3	12	20	
styrene	1.0136	1.1269	.3	11	20	
bromoform	.39846	.41663	.1	5	20	
isopropylbenzene	3.1932	3.5915	.1	12	20	
bromobenzene	.84329	.90575	.05	7	20	
n-propylbenzene	3.6352	4.2230	.05	16	20	
1,1,2,2,-tetrachloroethane	.67812	.71303	.3	5	20	
2-chlorotoluene	2.3296	2.5729	.05	10	20	
1,2,3-trichloropropane	.49557	.52234	.05	5	20	
1,3,5-trimethybenzene	2.6303	3.0316	.05	15	20	
4-chorotoluene	2.2427	2.5323	.05	13	20	
tert-butylbenzene	2.2838	2.5524	.05	12	20	
1,2,4-trimethylbenzene	2.6527	3.03	.05	14	20	
sec-butylbenzene	3.4242	3.9161	.05	14	20	
p-isopropyltoluene	2.8275	3.2840	.05	16	20	
1,3-dichlorobenzene	1.5651	1.7485	.6	12	20	
1,4-dichlorobenzene	1.6000	1.7490	.5	9	20	
n-butylbenzene	2.4383	3.0122	.05	24	20	F
1,2-dichlorobenzene	1.4443	1.5808	.4	9	20	
1,2-dibromo-3-chloropropane	.10573	.10421	.05	-1	20	
hexachlorobutadiene	.45607	.50843	.05	11	20	
1,2,4-trichlorobenzene	.95262	1.0884	.2	14	20	
naphthalene	2.1836	2.1540	.05	-1	20	
1,2,3-trichlorobenzene	.88772	.94881	.05	7	20	
dibromofluoromethane	.2538	.25912	.05	2	30	
1,2-dichloroethane-d4	.22706	.22681	.05	0	30	
toluene-d8	1.3076	1.3202	.05	1	30	
4-bromofluorobenzene	.90729	.94622	.05	4	30	

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7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503333

Instrument ID: Voa104.i   Calibration Date: 26-FEB-2015 Time: 09:24

Lab File ID: 0226A01   Init. Calib. Date(s): 14-NOV-2   14-NOV-2

Sample No: 8260 CCAL   Init. Calib. Times : 18:34   21:39

Compound	RRF (mean)	RRF	MIN RRF	%D	MAX %D	
dichlorodifluoromethane	.16305	.16132	.1	-1	20	
chloromethane	.31614	.3346	.1	6	20	
vinyl chloride	.2743	.30218	.1	10	20	
bromomethane	100	92.109	.1	-8	20	
chloroethane	.13774	.16747	.1	22	20	F
trichlorofluoromethane	.27387	.33272	.1	21	20	F
ethyl ether	.09232	.10183	.05	10	20	
1,1,-dichloroethene	.2177	.2101	.1	-3	20	
carbon disulfide	.70085	.65871	.1	-6	20	
methylene chloride	.26137	.26657	.1	2	20	
acetone	100	103	.1	3	20	
trans-1,2-dichloroethene	.25442	.27692	.1	9	20	
methyl tert butyl ether	.55986	.57764	.1	3	20	
Diisopropyl Ether	.94156	1.0861	.05	15	20	
1,1-dichloroethane	.49595	.54761	.2	10	20	
Ethyl-Tert-Butyl-Ether	.82014	.88906	.05	8	20	
cis-1,2-dichloroethene	.28074	.30744	.1	10	20	
2,2-dichloropropane	.35677	.41078	.05	15	20	
bromochloromethane	.12861	.13874	.05	8	20	
chloroform	.44837	.49548	.2	11	20	
carbontetrachloride	.32832	.38865	.1	18	20	
tetrahydrofuran	.06814	.07495	.05	10	20	
1,1,1-trichloroethane	.37681	.43364	.1	15	20	
2-butanone	.09192	.08775	.1	-5	20	F
1,1-dichloropropene	.33481	.39315	.05	17	20	
benzene	.97656	1.0854	.5	11	20	
Tertiary-Amyl Methyl Ether	.62875	.66375	.05	6	20	
1,2-dichloroethane	.30244	.32556	.1	8	20	
trichloroethene	.264	.30564	.2	16	20	
dibromomethane	.14205	.14938	.05	5	20	
1,2-dichloropropane	.27957	.31705	.1	13	20	
bromodichloromethane	.33098	.3693	.2	12	20	
1,4-dioxane	.00202	.00188	.05	-7	20	F
cis-1,3-dichloropropene	.39239	.44004	.2	12	20	
toluene	.87644	.97364	.4	11	20	
tetrachloroethene	.36363	.43586	.2	20	20	
4-methyl-2-pentanone	.07517	.08147	.1	8	20	F
trans-1,3-dichloropropene	.46349	.50844	.1	10	20	

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7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503333

Instrument ID: Voa104.i Calibration Date: 26-FEB-2015 Time: 09:24

Lab File ID: 0226A01 Init. Calib. Date(s): 14-NOV-2 14-NOV-2

Sample No: 8260 CCAL Init. Calib. Times : 18:34 21:39

Compound	$\overline{RRF}$	RRF	MIN RRF	%D	MAX %D	
1,1,2-trichloroethane	.23224	.25426	.1	9	20	
chlorodibromomethane	.34856	.37776	.1	8	20	
1,3-dichloropropane	.45928	.50097	.05	9	20	
1,2-dibromoethane	.28223	.29184	.1	3	20	
2-hexanone	.19278	.18813	.1	-2	20	
chlorobenzene	1.0010	1.1268	.5	13	20	
ethyl benzene	1.6393	1.9262	.1	17	20	
1,1,1,2-tetrachloroethane	.3581	.40537	.05	13	20	
p/m xylene	.63448	.76086	.1	20	20	
o xylene	.6125	.72299	.3	18	20	
styrene	1.0136	1.1857	.3	17	20	
bromoform	.39846	.41278	.1	4	20	
isopropylbenzene	3.1932	3.8084	.1	19	20	
bromobenzene	.84329	.91485	.05	8	20	
n-propylbenzene	3.6352	4.4578	.05	23	20	F
1,1,2,2,-tetrachloroethane	.67812	.71805	.3	6	20	
2-chlorotoluene	2.3296	2.6738	.05	15	20	
1,2,3-trichloropropane	.49557	.53038	.05	7	20	
1,3,5-trimethybenzene	2.6303	3.1135	.05	18	20	
4-chorotoluene	2.2427	2.6001	.05	16	20	
tert-butylbenzene	2.2838	2.6943	.05	18	20	
1,2,4-trimethylbenzene	2.6527	3.1157	.05	17	20	
sec-butylbenzene	3.4242	4.2210	.05	23	20	F
p-isopropyltoluene	2.8275	3.4808	.05	23	20	F
1,3-dichlorobenzene	1.5651	1.8018	.6	15	20	
1,4-dichlorobenzene	1.6000	1.8099	.5	13	20	
n-butylbenzene	2.4383	3.1992	.05	31	20	F
1,2-dichlorobenzene	1.4443	1.6026	.4	11	20	
1,2-dibromo-3-chloropropane	.10573	.09971	.05	-6	20	
hexachlorobutadiene	.45607	.54859	.05	20	20	F
1,2,4-trichlorobenzene	.95262	1.0847	.2	14	20	
naphthalene	2.1836	2.1082	.05	-3	20	
1,2,3-trichlorobenzene	.88772	.94791	.05	7	20	
dibromofluoromethane	.2538	.25972	.05	2	30	
1,2-dichloroethane-d4	.22706	.23342	.05	3	30	
toluene-d8	1.3076	1.3172	.05	1	30	
4-bromofluorobenzene	.90729	.91132	.05	0	30	

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ANALYTICAL REPORT

Lab Number:	L1503663
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Jay McMullen
Phone:	(617) 452-6303
Project Name:	KING OPEN SCHOOL
Project Number:	0139-107911
Report Date:	03/04/15

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

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

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1503663-01	CDM-3 1'-5'	SOIL	CAMBRIDGE, MA	02/26/15 15:09	02/26/15
L1503663-02	CDM-3 5'-9'	SOIL	CAMBRIDGE, MA	02/26/15 15:20	02/26/15

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

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).	YES
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)?	NO

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.

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. All specific QC 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. 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 (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar 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. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Metals.

Volatile Organics

In reference to question H:

The initial calibration, associated with L1503663-01 and -02, did not meet the method required minimum response factor on the lowest calibration standard for 4-methyl-2-pentanone (0.05631) and 1,4-dioxane (0.00244), as well as the average response factor for 2-butanone, 4-methyl-2-pentanone, and 1,4-dioxane.

The initial calibration verification is outside acceptance criteria for dichlorodifluoromethane (144%), but within overall method criteria.

The continuing calibration standards, associated with L1503663-01 and -02, are outside the acceptance criteria for several compounds; however, they are within overall method allowances. A copy of the continuing calibration standards is included as an addendum to this report.

EPH

In reference to question I:

All samples were analyzed for a subset of MCP compounds per the Chain of Custody.

Metals

In reference to question I:

All samples were analyzed for a subset of MCP elements per the Chain of Custody.

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: 03/04/15

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ORGANICS

VOLATILES

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID:	L1503663-01	Date Collected:	02/26/15 15:09
Client ID:	CDM-3 1'-5'	Date Received:	02/26/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Analytical Method:	97,8260C		
Analytical Date:	03/02/15 13:16		
Analyst:	BN		
Percent Solids:	86%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	10	--	1
1,1-Dichloroethane	ND		ug/kg	1.6	--	1
Chloroform	ND		ug/kg	1.6	--	1
Carbon tetrachloride	ND		ug/kg	1.0	--	1
1,2-Dichloropropane	ND		ug/kg	3.7	--	1
Dibromochloromethane	ND		ug/kg	1.0	--	1
1,1,2-Trichloroethane	ND		ug/kg	1.6	--	1
Tetrachloroethene	ND		ug/kg	1.0	--	1
Chlorobenzene	ND		ug/kg	1.0	--	1
Trichlorofluoromethane	ND		ug/kg	4.2	--	1
1,2-Dichloroethane	ND		ug/kg	1.0	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.0	--	1
Bromodichloromethane	ND		ug/kg	1.0	--	1
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.0	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.0	--	1
1,1-Dichloropropene	ND		ug/kg	4.2	--	1
Bromoform	ND		ug/kg	4.2	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	--	1
Benzene	ND		ug/kg	1.0	--	1
Toluene	ND		ug/kg	1.6	--	1
Ethylbenzene	ND		ug/kg	1.0	--	1
Chloromethane	ND		ug/kg	4.2	--	1
Bromomethane	ND		ug/kg	2.1	--	1
Vinyl chloride	ND		ug/kg	2.1	--	1
Chloroethane	ND		ug/kg	2.1	--	1
1,1-Dichloroethene	ND		ug/kg	1.0	--	1
trans-1,2-Dichloroethene	ND		ug/kg	1.6	--	1
Trichloroethene	ND		ug/kg	1.0	--	1
1,2-Dichlorobenzene	ND		ug/kg	4.2	--	1

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID: L1503663-01 Date Collected: 02/26/15 15:09
Client ID: CDM-3 1'-5' Date Received: 02/26/15
Sample Location: CAMBRIDGE, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	4.2	--	1
1,4-Dichlorobenzene	ND		ug/kg	4.2	--	1
Methyl tert butyl ether	ND		ug/kg	2.1	--	1
p/m-Xylene	ND		ug/kg	2.1	--	1
o-Xylene	ND		ug/kg	2.1	--	1
Xylenes, Total	ND		ug/kg	2.1	--	1
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--	1
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--	1
Dibromomethane	ND		ug/kg	4.2	--	1
1,2,3-Trichloropropane	ND		ug/kg	4.2	--	1
Styrene	ND		ug/kg	2.1	--	1
Dichlorodifluoromethane	ND		ug/kg	10	--	1
Acetone	ND		ug/kg	38	--	1
Carbon disulfide	ND		ug/kg	4.2	--	1
Methyl ethyl ketone	ND		ug/kg	10	--	1
Methyl isobutyl ketone	ND		ug/kg	10	--	1
2-Hexanone	ND		ug/kg	10	--	1
Bromochloromethane	ND		ug/kg	4.2	--	1
Tetrahydrofuran	ND		ug/kg	4.2	--	1
2,2-Dichloropropane	ND		ug/kg	5.3	--	1
1,2-Dibromoethane	ND		ug/kg	4.2	--	1
1,3-Dichloropropane	ND		ug/kg	4.2	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	--	1
Bromobenzene	ND		ug/kg	5.3	--	1
n-Butylbenzene	ND		ug/kg	1.0	--	1
sec-Butylbenzene	ND		ug/kg	1.0	--	1
tert-Butylbenzene	ND		ug/kg	4.2	--	1
o-Chlorotoluene	ND		ug/kg	4.2	--	1
p-Chlorotoluene	ND		ug/kg	4.2	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.2	--	1
Hexachlorobutadiene	ND		ug/kg	4.2	--	1
Isopropylbenzene	ND		ug/kg	1.0	--	1
p-Isopropyltoluene	ND		ug/kg	1.0	--	1
Naphthalene	ND		ug/kg	4.2	--	1
n-Propylbenzene	ND		ug/kg	1.0	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	4.2	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	4.2	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	4.2	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	4.2	--	1

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID: L1503663-01 Date Collected: 02/26/15 15:09
Client ID: CDM-3 1'-5' Date Received: 02/26/15
Sample Location: CAMBRIDGE, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	5.3	--	1
Diisopropyl Ether	ND		ug/kg	4.2	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	4.2	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	4.2	--	1
1,4-Dioxane	ND		ug/kg	42	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	102		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	112		70-130
Dibromofluoromethane	104		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID: L1503663-02
Client ID: CDM-3 5'-9'
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 03/01/15 13:22
Analyst: MV
Percent Solids: 82%

Date Collected: 02/26/15 15:20
Date Received: 02/26/15
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	11	--	1
1,1-Dichloroethane	ND		ug/kg	1.6	--	1
Chloroform	ND		ug/kg	1.6	--	1
Carbon tetrachloride	ND		ug/kg	1.1	--	1
1,2-Dichloropropane	ND		ug/kg	3.8	--	1
Dibromochloromethane	ND		ug/kg	1.1	--	1
1,1,2-Trichloroethane	ND		ug/kg	1.6	--	1
Tetrachloroethene	ND		ug/kg	1.1	--	1
Chlorobenzene	ND		ug/kg	1.1	--	1
Trichlorofluoromethane	ND		ug/kg	4.3	--	1
1,2-Dichloroethane	ND		ug/kg	1.1	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.1	--	1
Bromodichloromethane	ND		ug/kg	1.1	--	1
trans-1,3-Dichloropropene	ND		ug/kg	1.1	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.1	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.1	--	1
1,1-Dichloropropene	ND		ug/kg	4.3	--	1
Bromoform	ND		ug/kg	4.3	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.1	--	1
Benzene	ND		ug/kg	1.1	--	1
Toluene	ND		ug/kg	1.6	--	1
Ethylbenzene	ND		ug/kg	1.1	--	1
Chloromethane	ND		ug/kg	4.3	--	1
Bromomethane	ND		ug/kg	2.2	--	1
Vinyl chloride	ND		ug/kg	2.2	--	1
Chloroethane	ND		ug/kg	2.2	--	1
1,1-Dichloroethene	ND		ug/kg	1.1	--	1
trans-1,2-Dichloroethene	ND		ug/kg	1.6	--	1
Trichloroethene	ND		ug/kg	1.1	--	1
1,2-Dichlorobenzene	ND		ug/kg	4.3	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663

Project Number: 0139-107911 **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID: L1503663-02 Date Collected: 02/26/15 15:20
Client ID: CDM-3 5'-9' Date Received: 02/26/15
Sample Location: CAMBRIDGE, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	4.3	--	1
1,4-Dichlorobenzene	ND		ug/kg	4.3	--	1
Methyl tert butyl ether	ND		ug/kg	2.2	--	1
p/m-Xylene	ND		ug/kg	2.2	--	1
o-Xylene	ND		ug/kg	2.2	--	1
Xylenes, Total	ND		ug/kg	2.2	--	1
cis-1,2-Dichloroethene	ND		ug/kg	1.1	--	1
1,2-Dichloroethene, Total	ND		ug/kg	1.1	--	1
Dibromomethane	ND		ug/kg	4.3	--	1
1,2,3-Trichloropropane	ND		ug/kg	4.3	--	1
Styrene	ND		ug/kg	2.2	--	1
Dichlorodifluoromethane	ND		ug/kg	11	--	1
Acetone	ND		ug/kg	39	--	1
Carbon disulfide	ND		ug/kg	4.3	--	1
Methyl ethyl ketone	ND		ug/kg	11	--	1
Methyl isobutyl ketone	ND		ug/kg	11	--	1
2-Hexanone	ND		ug/kg	11	--	1
Bromochloromethane	ND		ug/kg	4.3	--	1
Tetrahydrofuran	ND		ug/kg	4.3	--	1
2,2-Dichloropropane	ND		ug/kg	5.4	--	1
1,2-Dibromoethane	ND		ug/kg	4.3	--	1
1,3-Dichloropropane	ND		ug/kg	4.3	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.1	--	1
Bromobenzene	ND		ug/kg	5.4	--	1
n-Butylbenzene	ND		ug/kg	1.1	--	1
sec-Butylbenzene	ND		ug/kg	1.1	--	1
tert-Butylbenzene	ND		ug/kg	4.3	--	1
o-Chlorotoluene	ND		ug/kg	4.3	--	1
p-Chlorotoluene	ND		ug/kg	4.3	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.3	--	1
Hexachlorobutadiene	ND		ug/kg	4.3	--	1
Isopropylbenzene	ND		ug/kg	1.1	--	1
p-Isopropyltoluene	ND		ug/kg	1.1	--	1
Naphthalene	ND		ug/kg	4.3	--	1
n-Propylbenzene	ND		ug/kg	1.1	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	4.3	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	4.3	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	4.3	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	4.3	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID:	L1503663-02	Date Collected:	02/26/15 15:20
Client ID:	CDM-3 5'-9'	Date Received:	02/26/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	5.4	--	1
Diisopropyl Ether	ND		ug/kg	4.3	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	4.3	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	4.3	--	1
1,4-Dioxane	ND		ug/kg	43	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	106		70-130
4-Bromofluorobenzene	117		70-130
Dibromofluoromethane	106		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663

Project Number: 0139-107911 **Report Date:** 03/04/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 03/01/15 10:18
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02 Batch: WG765450-6					
Methylene chloride	ND		ug/kg	10	--
1,1-Dichloroethane	ND		ug/kg	1.5	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	3.5	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.5	--
Tetrachloroethene	ND		ug/kg	1.0	--
Chlorobenzene	ND		ug/kg	1.0	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	1.0	--
Bromodichloromethane	ND		ug/kg	1.0	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	1.0	--
1,3-Dichloropropene, Total	ND		ug/kg	1.0	--
1,1-Dichloropropene	ND		ug/kg	4.0	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	--
Benzene	ND		ug/kg	1.0	--
Toluene	ND		ug/kg	1.5	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	2.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	1.0	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 03/01/15 10:18
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02 Batch: WG765450-6					
1,2-Dichlorobenzene	ND		ug/kg	4.0	--
1,3-Dichlorobenzene	ND		ug/kg	4.0	--
1,4-Dichlorobenzene	ND		ug/kg	4.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	2.0	--
Xylenes, Total	ND		ug/kg	2.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	4.0	--
1,2,3-Trichloropropane	ND		ug/kg	4.0	--
Styrene	ND		ug/kg	2.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	36	--
Carbon disulfide	ND		ug/kg	4.0	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	4.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	5.0	--
1,2-Dibromoethane	ND		ug/kg	4.0	--
1,3-Dichloropropane	ND		ug/kg	4.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	--
Bromobenzene	ND		ug/kg	5.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	4.0	--
o-Chlorotoluene	ND		ug/kg	4.0	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 03/01/15 10:18
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02 Batch: WG765450-6					
p-Chlorotoluene	ND		ug/kg	4.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	4.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	4.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	4.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	4.0	--
Diethyl ether	ND		ug/kg	5.0	--
Diisopropyl Ether	ND		ug/kg	4.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	4.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	4.0	--
1,4-Dioxane	ND		ug/kg	40	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	104		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	104		70-130

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Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503663
Project Number:	0139-107911	**Report Date:**	03/04/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 03/02/15 09:46
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01 Batch: WG765727-3					
Methylene chloride	ND		ug/kg	10	--
1,1-Dichloroethane	ND		ug/kg	1.5	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	3.5	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.5	--
Tetrachloroethene	ND		ug/kg	1.0	--
Chlorobenzene	ND		ug/kg	1.0	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	1.0	--
Bromodichloromethane	ND		ug/kg	1.0	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	1.0	--
1,3-Dichloropropene, Total	ND		ug/kg	1.0	--
1,1-Dichloropropene	ND		ug/kg	4.0	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	--
Benzene	ND		ug/kg	1.0	--
Toluene	ND		ug/kg	1.5	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	2.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	1.0	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 03/02/15 09:46
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01 Batch: WG765727-3					
1,2-Dichlorobenzene	ND		ug/kg	4.0	--
1,3-Dichlorobenzene	ND		ug/kg	4.0	--
1,4-Dichlorobenzene	ND		ug/kg	4.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	2.0	--
Xylenes, Total	ND		ug/kg	2.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	4.0	--
1,2,3-Trichloropropane	ND		ug/kg	4.0	--
Styrene	ND		ug/kg	2.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	36	--
Carbon disulfide	ND		ug/kg	4.0	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	4.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	5.0	--
1,2-Dibromoethane	ND		ug/kg	4.0	--
1,3-Dichloropropane	ND		ug/kg	4.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	--
Bromobenzene	ND		ug/kg	5.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	4.0	--
o-Chlorotoluene	ND		ug/kg	4.0	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 03/02/15 09:46
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01 Batch: WG765727-3					
p-Chlorotoluene	ND		ug/kg	4.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	4.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	4.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	4.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	4.0	--
Diethyl ether	ND		ug/kg	5.0	--
Diisopropyl Ether	ND		ug/kg	4.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	4.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	4.0	--
1,4-Dioxane	ND		ug/kg	40	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	103		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	104		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503663
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02 Batch: WG765450-4 WG765450-5								
Methylene chloride	95		94		70-130	1		20
1,1-Dichloroethane	99		95		70-130	4		20
Chloroform	102		99		70-130	3		20
Carbon tetrachloride	104		99		70-130	5		20
1,2-Dichloropropane	104		103		70-130	1		20
Dibromochloromethane	102		102		70-130	0		20
1,1,2-Trichloroethane	102		102		70-130	0		20
Tetrachloroethene	109		104		70-130	5		20
Chlorobenzene	105		102		70-130	3		20
Trichlorofluoromethane	102		95		70-130	7		20
1,2-Dichloroethane	99		100		70-130	1		20
1,1,1-Trichloroethane	102		98		70-130	4		20
Bromodichloromethane	105		104		70-130	1		20
trans-1,3-Dichloropropene	102		102		70-130	0		20
cis-1,3-Dichloropropene	105		104		70-130	1		20
1,1-Dichloropropene	104		98		70-130	6		20
Bromoform	100		100		70-130	0		20
1,1,2,2-Tetrachloroethane	99		99		70-130	0		20
Benzene	100		97		70-130	3		20
Toluene	102		100		70-130	2		20
Ethylbenzene	110		106		70-130	4		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02 Batch: WG765450-4 WG765450-5								
Chloromethane	75		88		70-130	16		20
Bromomethane	81		81		70-130	0		20
Vinyl chloride	95		88		70-130	8		20
Chloroethane	102		96		70-130	6		20
1,1-Dichloroethene	85		86		70-130	1		20
trans-1,2-Dichloroethene	97		92		70-130	5		20
Trichloroethene	106		100		70-130	6		20
1,2-Dichlorobenzene	106		104		70-130	2		20
1,3-Dichlorobenzene	110		107		70-130	3		20
1,4-Dichlorobenzene	106		104		70-130	2		20
Methyl tert butyl ether	94		93		70-130	1		20
p/m-Xylene	112		108		70-130	4		20
o-Xylene	110		106		70-130	4		20
cis-1,2-Dichloroethene	100		96		70-130	4		20
Dibromomethane	97		96		70-130	1		20
1,2,3-Trichloropropane	100		100		70-130	0		20
Styrene	109		106		70-130	3		20
Dichlorodifluoromethane	84		77		70-130	9		20
Acetone	120		110		70-130	9		20
Carbon disulfide	84		83		70-130	1		20
Methyl ethyl ketone	106		99		70-130	7		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02 Batch: WG765450-4 WG765450-5								
Methyl isobutyl ketone	102		101		70-130	1		20
2-Hexanone	100		98		70-130	2		20
Bromochloromethane	96		96		70-130	0		20
Tetrahydrofuran	98		98		70-130	0		20
2,2-Dichloropropane	102		97		70-130	5		20
1,2-Dibromoethane	97		97		70-130	0		20
1,3-Dichloropropane	101		101		70-130	0		20
1,1,1,2-Tetrachloroethane	104		103		70-130	1		20
Bromobenzene	102		102		70-130	0		20
n-Butylbenzene	124		118		70-130	5		20
sec-Butylbenzene	115		109		70-130	5		20
tert-Butylbenzene	110		107		70-130	3		20
o-Chlorotoluene	108		106		70-130	2		20
p-Chlorotoluene	110		108		70-130	2		20
1,2-Dibromo-3-chloropropane	95		94		70-130	1		20
Hexachlorobutadiene	110		107		70-130	3		20
Isopropylbenzene	111		108		70-130	3		20
p-Isopropyltoluene	115		111		70-130	4		20
Naphthalene	94		95		70-130	1		20
n-Propylbenzene	114		111		70-130	3		20
1,2,3-Trichlorobenzene	102		101		70-130	1		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1503663
Project Number: 0139-107911
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02 Batch: WG765450-4 WG765450-5								
1,2,4-Trichlorobenzene	109		109		70-130	0		20
1,3,5-Trimethylbenzene	112		108		70-130	4		20
1,2,4-Trimethylbenzene	111		109		70-130	2		20
Diethyl ether	102		99		70-130	3		20
Diisopropyl Ether	105		103		70-130	2		20
Ethyl-Tert-Butyl-Ether	100		98		70-130	2		20
Tertiary-Amyl Methyl Ether	98		98		70-130	0		20
1,4-Dioxane	85		95		70-130	11		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	100		99		70-130
Toluene-d8	100		102		70-130
4-Bromofluorobenzene	102		104		70-130
Dibromofluoromethane	102		102		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01 Batch: WG765727-1 WG765727-2								
Methylene chloride	110		109		70-130	1		20
1,1-Dichloroethane	110		107		70-130	3		20
Chloroform	107		104		70-130	3		20
Carbon tetrachloride	113		110		70-130	3		20
1,2-Dichloropropane	108		106		70-130	2		20
Dibromochloromethane	100		98		70-130	2		20
1,1,2-Trichloroethane	100		97		70-130	3		20
Tetrachloroethene	110		106		70-130	4		20
Chlorobenzene	104		102		70-130	2		20
Trichlorofluoromethane	124		123		70-130	1		20
1,2-Dichloroethane	106		102		70-130	4		20
1,1,1-Trichloroethane	111		108		70-130	3		20
Bromodichloromethane	106		105		70-130	1		20
trans-1,3-Dichloropropene	102		98		70-130	4		20
cis-1,3-Dichloropropene	105		102		70-130	3		20
1,1-Dichloropropene	114		110		70-130	4		20
Bromoform	97		95		70-130	2		20
1,1,2,2-Tetrachloroethane	97		93		70-130	4		20
Benzene	109		106		70-130	3		20
Toluene	104		102		70-130	2		20
Ethylbenzene	108		106		70-130	2		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01 Batch: WG765727-1 WG765727-2								
Chloromethane	114		116		70-130	2		20
Bromomethane	108		114		70-130	5		20
Vinyl chloride	120		116		70-130	3		20
Chloroethane	129		**133**	Q	70-130	3		20
1,1-Dichloroethene	101		99		70-130	2		20
trans-1,2-Dichloroethene	110		107		70-130	3		20
Trichloroethene	110		108		70-130	2		20
1,2-Dichlorobenzene	102		102		70-130	0		20
1,3-Dichlorobenzene	106		106		70-130	0		20
1,4-Dichlorobenzene	104		102		70-130	2		20
Methyl tert butyl ether	104		99		70-130	5		20
p/m-Xylene	110		108		70-130	2		20
o-Xylene	107		105		70-130	2		20
cis-1,2-Dichloroethene	108		107		70-130	1		20
Dibromomethane	101		96		70-130	5		20
1,2,3-Trichloropropane	95		94		70-130	1		20
Styrene	106		104		70-130	2		20
Dichlorodifluoromethane	108		104		70-130	4		20
Acetone	**138**	Q	116		70-130	17		20
Carbon disulfide	101		100		70-130	1		20
Methyl ethyl ketone	111		102		70-130	8		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01 Batch: WG765727-1 WG765727-2								
Methyl isobutyl ketone	97		92		70-130	5		20
2-Hexanone	98		89		70-130	10		20
Bromochloromethane	105		103		70-130	2		20
Tetrahydrofuran	95		99		70-130	4		20
2,2-Dichloropropane	110		107		70-130	3		20
1,2-Dibromoethane	97		94		70-130	3		20
1,3-Dichloropropane	101		97		70-130	4		20
1,1,1,2-Tetrachloroethane	102		101		70-130	1		20
Bromobenzene	101		99		70-130	2		20
n-Butylbenzene	118		116		70-130	2		20
sec-Butylbenzene	109		108		70-130	1		20
tert-Butylbenzene	106		104		70-130	2		20
o-Chlorotoluene	105		104		70-130	1		20
p-Chlorotoluene	107		107		70-130	0		20
1,2-Dibromo-3-chloropropane	88		84		70-130	5		20
Hexachlorobutadiene	107		107		70-130	0		20
Isopropylbenzene	106		106		70-130	0		20
p-Isopropyltoluene	110		109		70-130	1		20
Naphthalene	90		87		70-130	3		20
n-Propylbenzene	110		108		70-130	2		20
1,2,3-Trichlorobenzene	100		99		70-130	1		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01 Batch: WG765727-1 WG765727-2								
1,2,4-Trichlorobenzene	108		105		70-130	3		20
1,3,5-Trimethylbenzene	108		107		70-130	1		20
1,2,4-Trimethylbenzene	108		107		70-130	1		20
Diethyl ether	117		118		70-130	1		20
Diisopropyl Ether	113		110		70-130	3		20
Ethyl-Tert-Butyl-Ether	106		102		70-130	4		20
Tertiary-Amyl Methyl Ether	101		96		70-130	5		20
1,4-Dioxane	94		86		70-130	9		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	99		98		70-130
Toluene-d8	99		100		70-130
4-Bromofluorobenzene	102		102		70-130
Dibromofluoromethane	103		102		70-130

SEMIVOLATILES

Project Name: KING OPEN SCHOOL
Lab Number: L1503663
Project Number: 0139-107911
Report Date: 03/04/15

SAMPLE RESULTS

Lab ID:	L1503663-01	Date Collected:	02/26/15 15:09
Client ID:	CDM-3 1'-5'	Date Received:	02/26/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/28/15 00:13
Analytical Date:	03/03/15 02:24		
Analyst:	JB		
Percent Solids:	86%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	--	1
2-Chloronaphthalene	ND		ug/kg	190	--	1
1,2-Dichlorobenzene	ND		ug/kg	190	--	1
1,3-Dichlorobenzene	ND		ug/kg	190	--	1
1,4-Dichlorobenzene	ND		ug/kg	190	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	--	1
2,4-Dinitrotoluene	ND		ug/kg	190	--	1
2,6-Dinitrotoluene	ND		ug/kg	190	--	1
Azobenzene	ND		ug/kg	190	--	1
Fluoranthene	130		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	--	1
Hexachlorobutadiene	ND		ug/kg	190	--	1
Hexachloroethane	ND		ug/kg	150	--	1
Isophorone	ND		ug/kg	170	--	1
Naphthalene	ND		ug/kg	190	--	1
Nitrobenzene	ND		ug/kg	170	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	190	--	1
Butyl benzyl phthalate	ND		ug/kg	190	--	1
Di-n-butylphthalate	ND		ug/kg	190	--	1
Di-n-octylphthalate	ND		ug/kg	190	--	1
Diethyl phthalate	ND		ug/kg	190	--	1
Dimethyl phthalate	ND		ug/kg	190	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	150		ug/kg	110	--	1

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Project Name: KING OPEN SCHOOL | **Lab Number:** L1503663
Project Number: 0139-107911 | **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID:	L1503663-01	Date Collected:	02/26/15 15:09
Client ID:	CDM-3 1'-5'	Date Received:	02/26/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	150	--	1
Pyrene	120		ug/kg	110	--	1
Aniline	ND		ug/kg	230	--	1
4-Chloroaniline	ND		ug/kg	190	--	1
Dibenzofuran	ND		ug/kg	190	--	1
2-Methylnaphthalene	ND		ug/kg	230	--	1
Acetophenone	ND		ug/kg	190	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	190	--	1
2,4-Dichlorophenol	ND		ug/kg	170	--	1
2,4-Dimethylphenol	ND		ug/kg	190	--	1
2-Nitrophenol	ND		ug/kg	410	--	1
4-Nitrophenol	ND		ug/kg	260	--	1
2,4-Dinitrophenol	ND		ug/kg	910	--	1
Pentachlorophenol	ND		ug/kg	380	--	1
Phenol	ND		ug/kg	190	--	1
2-Methylphenol	ND		ug/kg	190	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	--	1
2,4,5-Trichlorophenol	ND		ug/kg	190	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	65		30-130
Phenol-d6	68		30-130
Nitrobenzene-d5	56		30-130
2-Fluorobiphenyl	63		30-130
2,4,6-Tribromophenol	71		30-130
4-Terphenyl-d14	60		30-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663

Project Number: 0139-107911 **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID:	L1503663-02	Date Collected:	02/26/15 15:20
Client ID:	CDM-3 5'-9'	Date Received:	02/26/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/28/15 00:13
Analytical Date:	03/03/15 02:50		
Analyst:	JB		
Percent Solids:	82%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	160	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	200	--	1
Hexachlorobenzene	ND		ug/kg	120	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	180	--	1
2-Chloronaphthalene	ND		ug/kg	200	--	1
1,2-Dichlorobenzene	ND		ug/kg	200	--	1
1,3-Dichlorobenzene	ND		ug/kg	200	--	1
1,4-Dichlorobenzene	ND		ug/kg	200	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	200	--	1
2,4-Dinitrotoluene	ND		ug/kg	200	--	1
2,6-Dinitrotoluene	ND		ug/kg	200	--	1
Azobenzene	ND		ug/kg	200	--	1
Fluoranthene	ND		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	200	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	240	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	220	--	1
Hexachlorobutadiene	ND		ug/kg	200	--	1
Hexachloroethane	ND		ug/kg	160	--	1
Isophorone	ND		ug/kg	180	--	1
Naphthalene	ND		ug/kg	200	--	1
Nitrobenzene	ND		ug/kg	180	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	200	--	1
Butyl benzyl phthalate	ND		ug/kg	200	--	1
Di-n-butylphthalate	ND		ug/kg	200	--	1
Di-n-octylphthalate	ND		ug/kg	200	--	1
Diethyl phthalate	ND		ug/kg	200	--	1
Dimethyl phthalate	ND		ug/kg	200	--	1
Benzo(a)anthracene	ND		ug/kg	120	--	1
Benzo(a)pyrene	ND		ug/kg	160	--	1
Benzo(b)fluoranthene	ND		ug/kg	120	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID:	L1503663-02	Date Collected:	02/26/15 15:20
Client ID:	CDM-3 5'-9'	Date Received:	02/26/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	ND		ug/kg	120	--	1
Chrysene	ND		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	160	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	ND		ug/kg	160	--	1
Fluorene	ND		ug/kg	200	--	1
Phenanthrene	ND		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	120	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	160	--	1
Pyrene	ND		ug/kg	120	--	1
Aniline	ND		ug/kg	240	--	1
4-Chloroaniline	ND		ug/kg	200	--	1
Dibenzofuran	ND		ug/kg	200	--	1
2-Methylnaphthalene	ND		ug/kg	240	--	1
Acetophenone	ND		ug/kg	200	--	1
2,4,6-Trichlorophenol	ND		ug/kg	120	--	1
2-Chlorophenol	ND		ug/kg	200	--	1
2,4-Dichlorophenol	ND		ug/kg	180	--	1
2,4-Dimethylphenol	ND		ug/kg	200	--	1
2-Nitrophenol	ND		ug/kg	430	--	1
4-Nitrophenol	ND		ug/kg	280	--	1
2,4-Dinitrophenol	ND		ug/kg	960	--	1
Pentachlorophenol	ND		ug/kg	400	--	1
Phenol	ND		ug/kg	200	--	1
2-Methylphenol	ND		ug/kg	200	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	290	--	1
2,4,5-Trichlorophenol	ND		ug/kg	200	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	36		30-130
Phenol-d6	46		30-130
Nitrobenzene-d5	36		30-130
2-Fluorobiphenyl	50		30-130
2,4,6-Tribromophenol	48		30-130
4-Terphenyl-d14	66		30-130

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503663
Report Date: 03/04/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 03/02/15 14:13
Analyst: JB

Extraction Method: EPA 3546
Extraction Date: 02/28/15 00:13

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG765336-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	97	--
Bis(2-chloroethyl)ether	ND		ug/kg	150	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	160	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	160	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	97	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	190	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	130	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	97	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 03/02/15 14:13
Analyst: JB

Extraction Method: EPA 3546
Extraction Date: 02/28/15 00:13

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG765336-1					
Benzo(b)fluoranthene	ND		ug/kg	97	--
Benzo(k)fluoranthene	ND		ug/kg	97	--
Chrysene	ND		ug/kg	97	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	97	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	97	--
Dibenzo(a,h)anthracene	ND		ug/kg	97	--
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	97	--
Aniline	ND		ug/kg	190	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	190	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	97	--
2-Chlorophenol	ND		ug/kg	160	--
2,4-Dichlorophenol	ND		ug/kg	150	--
2,4-Dimethylphenol	ND		ug/kg	160	--
2-Nitrophenol	ND		ug/kg	350	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	780	--
Pentachlorophenol	ND		ug/kg	320	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	230	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 03/02/15 14:13
Analyst: JB

Extraction Method: EPA 3546
Extraction Date: 02/28/15 00:13

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG765336-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	42		30-130
Phenol-d6	47		30-130
Nitrobenzene-d5	42		30-130
2-Fluorobiphenyl	52		30-130
2,4,6-Tribromophenol	50		30-130
4-Terphenyl-d14	69		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1503663
Project Number: 0139-107911
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG765336-2 WG765336-3								
Acenaphthene	77		72		40-140	7		30
1,2,4-Trichlorobenzene	71		63		40-140	12		30
Hexachlorobenzene	72		70		40-140	3		30
Bis(2-chloroethyl)ether	66		59		40-140	11		30
2-Chloronaphthalene	72		68		40-140	6		30
1,2-Dichlorobenzene	64		58		40-140	10		30
1,3-Dichlorobenzene	61		54		40-140	12		30
1,4-Dichlorobenzene	62		56		40-140	10		30
3,3'-Dichlorobenzidine	51		49		40-140	4		30
2,4-Dinitrotoluene	78		76		40-140	3		30
2,6-Dinitrotoluene	70		69		40-140	1		30
Azobenzene	76		72		40-140	5		30
Fluoranthene	79		80		40-140	1		30
4-Bromophenyl phenyl ether	74		70		40-140	6		30
Bis(2-chloroisopropyl)ether	70		63		40-140	11		30
Bis(2-chloroethoxy)methane	70		64		40-140	9		30
Hexachlorobutadiene	71		65		40-140	9		30
Hexachloroethane	64		57		40-140	12		30
Isophorone	68		64		40-140	6		30
Naphthalene	73		67		40-140	9		30
Nitrobenzene	72		66		40-140	9		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG765336-2 WG765336-3								
Bis(2-Ethylhexyl)phthalate	84		83		40-140	1		30
Butyl benzyl phthalate	78		80		40-140	3		30
Di-n-butylphthalate	84		85		40-140	1		30
Di-n-octylphthalate	83		84		40-140	1		30
Diethyl phthalate	76		73		40-140	4		30
Dimethyl phthalate	77		72		40-140	7		30
Benzo(a)anthracene	80		80		40-140	0		30
Benzo(a)pyrene	85		84		40-140	1		30
Benzo(b)fluoranthene	76		76		40-140	0		30
Benzo(k)fluoranthene	90		88		40-140	2		30
Chrysene	81		79		40-140	3		30
Acenaphthylene	73		68		40-140	7		30
Anthracene	80		77		40-140	4		30
Benzo(ghi)perylene	80		79		40-140	1		30
Fluorene	79		74		40-140	7		30
Phenanthrene	79		76		40-140	4		30
Dibenzo(a,h)anthracene	81		79		40-140	3		30
Indeno(1,2,3-cd)Pyrene	79		80		40-140	1		30
Pyrene	77		79		40-140	3		30
Aniline	**32**	Q	**28**	Q	40-140	13		30
4-Chloroaniline	43		40		40-140	7		30

ALPHA ANALYTICAL

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG765336-2 WG765336-3								
Dibenzofuran	76		72		40-140	5		30
2-Methylnaphthalene	72		66		40-140	9		30
Acetophenone	74		67		40-140	10		30
2,4,6-Trichlorophenol	70		66		30-130	6		30
2-Chlorophenol	69		63		30-130	9		30
2,4-Dichlorophenol	75		71		30-130	5		30
2,4-Dimethylphenol	63		58		30-130	8		30
2-Nitrophenol	67		61		30-130	9		30
4-Nitrophenol	72		76		30-130	5		30
2,4-Dinitrophenol	58		59		30-130	2		30
Pentachlorophenol	72		72		30-130	0		30
Phenol	70		65		30-130	7		30
2-Methylphenol	71		65		30-130	9		30
3-Methylphenol/4-Methylphenol	71		66		30-130	7		30
2,4,5-Trichlorophenol	72		70		30-130	3		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL

Project Number: 0139-107911

Lab Number: L1503663

Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG765336-2 WG765336-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	69		61		30-130
Phenol-d6	73		67		30-130
Nitrobenzene-d5	68		61		30-130
2-Fluorobiphenyl	74		68		30-130
2,4,6-Tribromophenol	77		73		30-130
4-Terphenyl-d14	73		75		30-130

PETROLEUM HYDROCARBONS

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503663
Project Number:	0139-107911	**Report Date:**	03/04/15

SAMPLE RESULTS

Lab ID:	L1503663-01	Date Collected:	02/26/15 15:09
Client ID:	CDM-3 1'-5'	Date Received:	02/26/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/27/15 01:59
Analytical Date:	02/28/15 17:14	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/27/15
Percent Solids:	86%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.56	--	1
C19-C36 Aliphatics	12.6		mg/kg	7.56	--	1
C11-C22 Aromatics	ND		mg/kg	7.56	--	1
C11-C22 Aromatics, Adjusted	ND		mg/kg	7.56	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	77		40-140
o-Terphenyl	73		40-140
2-Fluorobiphenyl	73		40-140
2-Bromonaphthalene	74		40-140

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503663
Project Number:	0139-107911	**Report Date:**	03/04/15

SAMPLE RESULTS

Lab ID:	L1503663-02	Date Collected:	02/26/15 15:20
Client ID:	CDM-3 5'-9'	Date Received:	02/26/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/27/15 01:59
Analytical Date:	02/28/15 20:23	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/27/15
Percent Solids:	82%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.76	--	1
C19-C36 Aliphatics	ND		mg/kg	7.76	--	1
C11-C22 Aromatics	ND		mg/kg	7.76	--	1
C11-C22 Aromatics, Adjusted	ND		mg/kg	7.76	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	70		40-140
o-Terphenyl	72		40-140
2-Fluorobiphenyl	74		40-140
2-Bromonaphthalene	75		40-140

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503663
Report Date: 03/04/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 02/28/15 15:38
Analyst: SR

Extraction Method: EPA 3546
Extraction Date: 02/27/15 01:59
Cleanup Method: EPH-04-1
Cleanup Date: 02/27/15

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG765126-1					
C9-C18 Aliphatics	ND		mg/kg	6.32	--
C19-C36 Aliphatics	ND		mg/kg	6.32	--
C11-C22 Aromatics	ND		mg/kg	6.32	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.32	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	63		40-140
o-Terphenyl	91		40-140
2-Fluorobiphenyl	90		40-140
2-Bromonaphthalene	93		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG765126-2 WG765126-3								
C9-C18 Aliphatics	61		59		40-140	3		25
C19-C36 Aliphatics	74		71		40-140	4		25
C11-C22 Aromatics	74		74		40-140	0		25
Naphthalene	63		61		40-140	3		25
2-Methylnaphthalene	69		67		40-140	3		25
Acenaphthylene	58		58		40-140	0		25
Acenaphthene	70		68		40-140	3		25
Fluorene	73		71		40-140	3		25
Phenanthrene	75		74		40-140	1		25
Anthracene	80		81		40-140	1		25
Fluoranthene	77		78		40-140	1		25
Pyrene	78		78		40-140	0		25
Benzo(a)anthracene	74		74		40-140	0		25
Chrysene	80		80		40-140	0		25
Benzo(b)fluoranthene	77		78		40-140	1		25
Benzo(k)fluoranthene	79		79		40-140	0		25
Benzo(a)pyrene	71		71		40-140	0		25
Indeno(1,2,3-cd)Pyrene	63		64		40-140	2		25
Dibenzo(a,h)anthracene	74		74		40-140	0		25
Benzo(ghi)perylene	75		76		40-140	1		25
Nonane (C9)	51		52		30-140	2		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503663
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG765126-2 WG765126-3								
Decane (C10)	58		58		40-140	0		25
Dodecane (C12)	66		63		40-140	5		25
Tetradecane (C14)	70		66		40-140	6		25
Hexadecane (C16)	75		71		40-140	5		25
Octadecane (C18)	79		76		40-140	4		25
Nonadecane (C19)	80		78		40-140	3		25
Eicosane (C20)	82		79		40-140	4		25
Docosane (C22)	83		80		40-140	4		25
Tetracosane (C24)	84		81		40-140	4		25
Hexacosane (C26)	84		81		40-140	4		25
Octacosane (C28)	84		81		40-140	4		25
Triacontane (C30)	86		83		40-140	4		25
Hexatriacontane (C36)	88		86		40-140	2		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	76		71		40-140
o-Terphenyl	80		80		40-140
2-Fluorobiphenyl	72		77		40-140
2-Bromonaphthalene	74		81		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

PCBS

Project Name: KING OPEN SCHOOL | **Lab Number:** L1503663

Project Number: 0139-107911 | **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID:	L1503663-01	Date Collected:	02/26/15 15:09
Client ID:	CDM-3 1'-5'	Date Received:	02/26/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/28/15 01:32
Analytical Date:	02/28/15 21:00	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	02/28/15
Percent Solids:	86%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/28/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	38.1	--	1	A
Aroclor 1221	ND		ug/kg	38.1	--	1	A
Aroclor 1232	ND		ug/kg	38.1	--	1	A
Aroclor 1242	ND		ug/kg	38.1	--	1	A
Aroclor 1248	ND		ug/kg	38.1	--	1	A
Aroclor 1254	ND		ug/kg	38.1	--	1	B
Aroclor 1260	ND		ug/kg	38.1	--	1	A
Aroclor 1262	ND		ug/kg	38.1	--	1	A
Aroclor 1268	ND		ug/kg	38.1	--	1	A
PCBs, Total	ND		ug/kg	38.1	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	49		30-150	A
Decachlorobiphenyl	45		30-150	A
2,4,5,6-Tetrachloro-m-xylene	51		30-150	B
Decachlorobiphenyl	54		30-150	B

Project Name: KING OPEN SCHOOL

Project Number: 0139-107911

Lab Number: L1503663

Report Date: 03/04/15

SAMPLE RESULTS

Lab ID:	L1503663-02	Date Collected:	02/26/15 15:20
Client ID:	CDM-3 5'-9'	Date Received:	02/26/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/28/15 01:32
Analytical Date:	02/28/15 21:14	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	02/28/15
Percent Solids:	82%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/28/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	38.9	--	1	A
Aroclor 1221	ND		ug/kg	38.9	--	1	A
Aroclor 1232	ND		ug/kg	38.9	--	1	A
Aroclor 1242	ND		ug/kg	38.9	--	1	A
Aroclor 1248	ND		ug/kg	38.9	--	1	A
Aroclor 1254	ND		ug/kg	38.9	--	1	A
Aroclor 1260	ND		ug/kg	38.9	--	1	A
Aroclor 1262	ND		ug/kg	38.9	--	1	A
Aroclor 1268	ND		ug/kg	38.9	--	1	A
PCBs, Total	ND		ug/kg	38.9	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	62		30-150	A
Decachlorobiphenyl	58		30-150	A
2,4,5,6-Tetrachloro-m-xylene	56		30-150	B
Decachlorobiphenyl	64		30-150	B

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663

Project Number: 0139-107911 **Report Date:** 03/04/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 03/01/15 00:17
Analyst: JW

Extraction Method: EPA 3546
Extraction Date: 02/28/15 01:32
Cleanup Method: EPA 3665A
Cleanup Date: 02/28/15
Cleanup Method: EPA 3660B
Cleanup Date: 02/28/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-02 Batch: WG765341-1						
Aroclor 1016	ND		ug/kg	32.3	--	A
Aroclor 1221	ND		ug/kg	32.3	--	A
Aroclor 1232	ND		ug/kg	32.3	--	A
Aroclor 1242	ND		ug/kg	32.3	--	A
Aroclor 1248	ND		ug/kg	32.3	--	A
Aroclor 1254	ND		ug/kg	32.3	--	A
Aroclor 1260	ND		ug/kg	32.3	--	A
Aroclor 1262	ND		ug/kg	32.3	--	A
Aroclor 1268	ND		ug/kg	32.3	--	A
PCBs, Total	ND		ug/kg	32.3	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	56		30-150	A
Decachlorobiphenyl	58		30-150	A
2,4,5,6-Tetrachloro-m-xylene	58		30-150	B
Decachlorobiphenyl	63		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-02 Batch: WG765341-2 WG765341-3									
Aroclor 1016	62		51		40-140	19		30	A
Aroclor 1260	59		46		40-140	25		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	56		47		30-150	A
Decachlorobiphenyl	62		49		30-150	A
2,4,5,6-Tetrachloro-m-xylene	56		48		30-150	B
Decachlorobiphenyl	64		50		30-150	B

METALS

Project Name: KING OPEN SCHOOL
Lab Number: L1503663
Project Number: 0139-107911
Report Date: 03/04/15

SAMPLE RESULTS

Lab ID: L1503663-01
Date Collected: 02/26/15 15:09
Client ID: CDM-3 1'-5'
Date Received: 02/26/15
Sample Location: CAMBRIDGE, MA
Field Prep: Not Specified
Matrix: Soil
Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	7.0		mg/kg	0.45	--	1	02/27/15 07:00	02/27/15 17:30	EPA 3050B	97,6010C	TT
Barium, Total	19		mg/kg	0.45	--	1	02/27/15 07:00	02/28/15 08:58	EPA 3050B	97,6010C	BC
Cadmium, Total	ND		mg/kg	0.45	--	1	02/27/15 07:00	02/27/15 17:30	EPA 3050B	97,6010C	TT
Chromium, Total	12		mg/kg	0.45	--	1	02/27/15 07:00	02/27/15 17:30	EPA 3050B	97,6010C	TT
Lead, Total	38		mg/kg	2.3	--	1	02/27/15 07:00	02/27/15 17:30	EPA 3050B	97,6010C	TT
Mercury, Total	0.338		mg/kg	0.076	--	1	02/27/15 06:11	03/02/15 09:06	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.3	--	1	02/27/15 07:00	02/28/15 08:58	EPA 3050B	97,6010C	BC
Silver, Total	ND		mg/kg	0.45	--	1	02/27/15 07:00	02/27/15 17:30	EPA 3050B	97,6010C	TT

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663

Project Number: 0139-107911 **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID: L1503663-02 Date Collected: 02/26/15 15:20

Client ID: CDM-3 5'-9' Date Received: 02/26/15

Sample Location: CAMBRIDGE, MA Field Prep: Not Specified

Matrix: Soil

Percent Solids: 82%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.8		mg/kg	0.46	--	1	02/27/15 07:00	02/27/15 17:34	EPA 3050B	97,6010C	TT
Barium, Total	28		mg/kg	0.46	--	1	02/27/15 07:00	02/28/15 09:01	EPA 3050B	97,6010C	BC
Cadmium, Total	ND		mg/kg	0.46	--	1	02/27/15 07:00	02/27/15 17:34	EPA 3050B	97,6010C	TT
Chromium, Total	16		mg/kg	0.46	--	1	02/27/15 07:00	02/27/15 17:34	EPA 3050B	97,6010C	TT
Lead, Total	19		mg/kg	2.3	--	1	02/27/15 07:00	02/27/15 17:34	EPA 3050B	97,6010C	TT
Mercury, Total	0.138		mg/kg	0.077	--	1	02/27/15 06:11	03/02/15 09:08	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.3	--	1	02/27/15 07:00	02/28/15 09:01	EPA 3050B	97,6010C	BC
Silver, Total	ND		mg/kg	0.46	--	1	02/27/15 07:00	02/27/15 17:34	EPA 3050B	97,6010C	TT

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG765139-1										
Mercury, Total	ND		mg/kg	0.083	--	1	02/27/15 06:11	02/27/15 12:41	97,7471B	MC

Prep Information

Digestion Method: EPA 7471B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG765145-1										
Arsenic, Total	ND		mg/kg	0.40	--	1	02/27/15 07:00	02/27/15 15:51	97,6010C	TT
Barium, Total	ND		mg/kg	0.40	--	1	02/27/15 07:00	02/27/15 15:51	97,6010C	TT
Cadmium, Total	ND		mg/kg	0.40	--	1	02/27/15 07:00	02/27/15 15:51	97,6010C	TT
Chromium, Total	ND		mg/kg	0.40	--	1	02/27/15 07:00	02/27/15 15:51	97,6010C	TT
Lead, Total	ND		mg/kg	2.0	--	1	02/27/15 07:00	02/27/15 15:51	97,6010C	TT
Selenium, Total	ND		mg/kg	2.0	--	1	02/27/15 07:00	02/27/15 15:51	97,6010C	TT
Silver, Total	ND		mg/kg	0.40	--	1	02/27/15 07:00	02/27/15 15:51	97,6010C	TT

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG765139-2 WG765139-3 SRM Lot Number: D083-540								
Mercury, Total	119		120		75-126	1		30
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG765145-2 WG765145-3 SRM Lot Number: D083-540								
Arsenic, Total	98		82		78-122	18		30
Barium, Total	96		84		82-117	13		30
Cadmium, Total	88		86		82-118	2		30
Chromium, Total	92		82		79-121	11		30
Lead, Total	91		82		81-119	10		30
Selenium, Total	90		83		78-123	8		30
Silver, Total	94		82		74-125	14		30

INORGANICS
&
MISCELLANEOUS

Project Name: KING OPEN SCHOOL **Lab Number:** L1503663
Project Number: 0139-107911 **Report Date:** 03/04/15

SAMPLE RESULTS

Lab ID: L1503663-01
Client ID: CDM-3 1'-5'
Sample Location: CAMBRIDGE, MA
Matrix: Soil

Date Collected: 02/26/15 15:09
Date Received: 02/26/15
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	86.4		%	0.100	NA	1	-	02/26/15 22:47	30,2540G	RT

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Project Name: KING OPEN SCHOOL
Lab Number: L1503663
Project Number: 0139-107911
Report Date: 03/04/15

SAMPLE RESULTS

Lab ID: L1503663-02
Client ID: CDM-3 5'-9'
Sample Location: CAMBRIDGE, MA
Matrix: Soil

Date Collected: 02/26/15 15:20
Date Received: 02/26/15
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	82.2		%	0.100	NA	1	-	02/26/15 22:47	30,2540G	RT

Lab Duplicate Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG765101-1 QC Sample: L1503599-01 Client ID: DUP Sample						
Solids, Total	98.3	98.2	%	0		20

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: 02/26/2015 21:45

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503663-01A	Vial MeOH preserved	A	N/A	4.1	Y	Absent	MCP-8260HLW-10(14)
L1503663-01B	Vial water preserved	A	N/A	4.1	Y	Absent	MCP-8260HLW-10(14)
L1503663-01C	Vial water preserved	A	N/A	4.1	Y	Absent	MCP-8260HLW-10(14)
L1503663-01D	Glass 120ml/4oz unpreserved	A	N/A	4.1	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1503663-01E	Glass 250ml/8oz unpreserved	A	N/A	4.1	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1503663-02A	Vial MeOH preserved	A	N/A	4.1	Y	Absent	MCP-8260HLW-10(14)
L1503663-02B	Vial water preserved	A	N/A	4.1	Y	Absent	MCP-8260HLW-10(14)
L1503663-02C	Vial water preserved	A	N/A	4.1	Y	Absent	MCP-8260HLW-10(14)
L1503663-02D	Glass 120ml/4oz unpreserved	A	N/A	4.1	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)

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*Values in parentheses indicate holding time in days

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503663
Report Date: 03/04/15

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503663-02E	Glass 250ml/8oz unpreserved	A	N/A	4.1	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL - Estimated 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 EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

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

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

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 ten times (10x) 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. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

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.

Report Format: Data Usability Report

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503663
Project Number:	0139-107911	**Report Date:**	03/04/15

Data Qualifiers

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 lower value for the two columns 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.

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.

S - Analytical results are from modified screening analysis.

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

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

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.

98 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, 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.

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: 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
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

Serial_No:03041513:53

CHAIN OF CUSTODY

PAGE ____ OF ____

Date Rec'd in Lab: 2/26/15

ALPHA Job #: L1503663

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: CDM Smith
Address: 50 HAMPSHIRE ST CAMBRIDGE, MA 02139
Phone: 617 452 6419
Fax:
Email: wiDee@cdmsmith.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: King Open School
Project Location: Cambridge, MA
Project #: 0139-107911
Project Manager: Jay McMullen
ALPHA Quote #:

Turn-Around Time

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

Date Due: 3/5/15 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)

RUN TCLP IF 20X

ANALYSIS

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	VOC 6260	SVOC ABN	METALS RCRA8	EPH RANGES ONLY	PCB	Sample Specific Comments	TOTAL # BOTTLES
03663-01	CDM-3 1'-5'	2/26	3:09	S	EW	X	X	X	X	X		5
-02	CDM-3 5'-9'	2/26	3:20	S	EW	X	X	X	X	X		5

Container Type	V	A	A	A	A
Preservative	A	F	A	A	A

PLEASE ANSWER QUESTIONS ABOVE!

IS YOUR PROJECT MA MCP *or* CT RCP?

Relinquished By:	Date/Time	Received By:	Date/Time
Elizabeth Wr	2/26/15 3:37	T. Hudelle	2/26/15 1537
T. Hudelle	2/26/15 1800	[illegible]	2/26/15 1800

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)

7A
Volatile Organics CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503663

Instrument ID: Voa104.i   Calibration Date: 02-MAR-2015 Time: 08:27

Lab File ID: 0302A02   Init. Calib. Date(s): 14-NOV-2   14-NOV-2

Sample No: 8260 CCAL   Init. Calib. Times : 18:34   21:39

Compound	RRF (mean)	RRF	MIN RRF	%D	MAX %D	
dichlorodifluoromethane	.16305	.17633	.1	8	20	
chloromethane	.31614	.36053	.1	14	20	
vinyl chloride	.2743	.32985	.1	20	20	F
bromomethane	100	108	.1	8	20	
chloroethane	.13774	.17756	.1	29	20	F
trichlorofluoromethane	.27387	.33973	.1	24	20	F
ethyl ether	.09232	.10847	.05	17	20	
1,1,-dichloroethene	.2177	.21981	.1	1	20	
carbon disulfide	.70085	.70567	.1	1	20	
methylene chloride	.26137	.2881	.1	10	20	
acetone	100	138	.1	38	20	F
trans-1,2-dichloroethene	.25442	.27958	.1	10	20	
methyl tert butyl ether	.55986	.58253	.1	4	20	
Diisopropyl Ether	.94156	1.0621	.05	13	20	
1,1-dichloroethane	.49595	.54462	.2	10	20	
Ethyl-Tert-Butyl-Ether	.82014	.86823	.05	6	20	
cis-1,2-dichloroethene	.28074	.30264	.1	8	20	
2,2-dichloropropane	.35677	.39444	.05	11	20	
bromochloromethane	.12861	.13552	.05	5	20	
chloroform	.44837	.47884	.2	7	20	
carbontetrachloride	.32832	.37023	.1	13	20	
tetrahydrofuran	.06814	.0647	.05	-5	20	
1,1,1-trichloroethane	.37681	.41722	.1	11	20	
2-butanone	.09192	.10192	.1	11	20	F
1,1-dichloropropene	.33481	.38285	.05	14	20	
benzene	.97656	1.0649	.5	9	20	
Tertiary-Amyl Methyl Ether	.62875	.63535	.05	1	20	
1,2-dichloroethane	.30244	.32148	.1	6	20	
trichloroethene	.264	.29042	.2	10	20	
dibromomethane	.14205	.14379	.05	1	20	
1,2-dichloropropane	.27957	.30331	.1	8	20	
bromodichloromethane	.33098	.35256	.2	7	20	
1,4-dioxane	.00202	.0019	.05	-6	20	F
cis-1,3-dichloropropene	.39239	.41179	.2	5	20	
toluene	.87644	.90947	.4	4	20	
tetrachloroethene	.36363	.40004	.2	10	20	
4-methyl-2-pentanone	.07517	.07283	.1	-3	20	F
trans-1,3-dichloropropene	.46349	.47406	.1	2	20	

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7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503663

Instrument ID: Voa104.i   Calibration Date: 02-MAR-2015 Time: 08:27

Lab File ID: 0302A02   Init. Calib. Date(s): 14-NOV-2   14-NOV-2

Sample No: 8260 CCAL   Init. Calib. Times : 18:34   21:39

Compound	$\overline{RRF}$	RRF	MIN RRF	%D	MAX %D
1,1,2-trichloroethane	.23224	.2319	.1	0	20
chlorodibromomethane	.34856	.34893	.1	0	20
1,3-dichloropropane	.45928	.46339	.05	1	20
1,2-dibromoethane	.28223	.27393	.1	-3	20
2-hexanone	.19278	.1891	.1	-2	20
chlorobenzene	1.0010	1.0368	.5	4	20
ethyl benzene	1.6393	1.7737	.1	8	20
1,1,1,2-tetrachloroethane	.3581	.36685	.05	2	20
p/m xylene	.63448	.69889	.1	10	20
o xylene	.6125	.65768	.3	7	20
styrene	1.0136	1.0790	.3	6	20
bromoform	.39846	.38664	.1	-3	20
isopropylbenzene	3.1932	3.3933	.1	6	20
bromobenzene	.84329	.85221	.05	1	20
n-propylbenzene	3.6352	3.9934	.05	10	20
1,1,2,2,-tetrachloroethane	.67812	.65732	.3	-3	20
2-chlorotoluene	2.3296	2.4407	.05	5	20
1,2,3-trichloropropane	.49557	.47085	.05	-5	20
1,3,5-trimethybenzene	2.6303	2.8345	.05	8	20
4-chorotoluene	2.2427	2.3977	.05	7	20
tert-butylbenzene	2.2838	2.4107	.05	6	20
1,2,4-trimethylbenzene	2.6527	2.8573	.05	8	20
sec-butylbenzene	3.4242	3.7220	.05	9	20
p-isopropyltoluene	2.8275	3.1030	.05	10	20
1,3-dichlorobenzene	1.5651	1.6683	.6	7	20
1,4-dichlorobenzene	1.6000	1.6594	.5	4	20
n-butylbenzene	2.4383	2.8703	.05	18	20
1,2-dichlorobenzene	1.4443	1.4768	.4	2	20
1,2-dibromo-3-chloropropane	.10573	.0932	.05	-12	20
hexachlorobutadiene	.45607	.48805	.05	7	20
1,2,4-trichlorobenzene	.95262	1.0303	.2	8	20
naphthalene	2.1836	1.9772	.05	-9	20
1,2,3-trichlorobenzene	.88772	.89191	.05	0	20
dibromofluoromethane	.2538	.26114	.05	3	30
1,2-dichloroethane-d4	.22706	.22513	.05	-1	30
toluene-d8	1.3076	1.3000	.05	-1	30
4-bromofluorobenzene	.90729	.92315	.05	2	30

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7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503663

Instrument ID: Voa104.i   Calibration Date: 01-MAR-2015 Time: 08:32

Lab File ID: 0301A01   Init. Calib. Date(s): 14-NOV-2   14-NOV-2

Sample No: 8260 CCAL   Init. Calib. Times : 18:34   21:39

Compound	RRF (mean)	RRF	MIN RRF	%D	MAX %D	
dichlorodifluoromethane	.16305	.13757	.1	-16	20	
chloromethane	.31614	.23653	.1	-25	20	F
vinyl chloride	.2743	.26002	.1	-5	20	
bromomethane	100	81.059	.1	-19	20	
chloroethane	.13774	.14023	.1	2	20	
trichlorofluoromethane	.27387	.27983	.1	2	20	
ethyl ether	.09232	.09383	.05	2	20	
1,1,-dichloroethene	.2177	.18471	.1	-15	20	
carbon disulfide	.70085	.5922	.1	-16	20	
methylene chloride	.26137	.24857	.1	-5	20	
acetone	100	120	.1	20	20	F
trans-1,2-dichloroethene	.25442	.24628	.1	-3	20	
methyl tert butyl ether	.55986	.52895	.1	-6	20	
Diisopropyl Ether	.94156	.99255	.05	5	20	
1,1-dichloroethane	.49595	.49153	.2	-1	20	
Ethyl-Tert-Butyl-Ether	.82014	.8167	.05	0	20	
cis-1,2-dichloroethene	.28074	.2793	.1	-1	20	
2,2-dichloropropane	.35677	.36239	.05	2	20	
bromochloromethane	.12861	.1238	.05	-4	20	
chloroform	.44837	.45742	.2	2	20	
carbontetrachloride	.32832	.34073	.1	4	20	
tetrahydrofuran	.06814	.06689	.05	-2	20	
1,1,1-trichloroethane	.37681	.38601	.1	2	20	
2-butanone	.09192	.09781	.1	6	20	F
1,1-dichloropropene	.33481	.34693	.05	4	20	
benzene	.97656	.97189	.5	0	20	
Tertiary-Amyl Methyl Ether	.62875	.61726	.05	-2	20	
1,2-dichloroethane	.30244	.29873	.1	-1	20	
trichloroethene	.264	.27879	.2	6	20	
dibromomethane	.14205	.13721	.05	-3	20	
1,2-dichloropropane	.27957	.29079	.1	4	20	
bromodichloromethane	.33098	.34756	.2	5	20	
1,4-dioxane	.00202	.00172	.05	-15	20	F
cis-1,3-dichloropropene	.39239	.41288	.2	5	20	
toluene	.87644	.89762	.4	2	20	
tetrachloroethene	.36363	.39567	.2	9	20	
4-methyl-2-pentanone	.07517	.07711	.1	3	20	F
trans-1,3-dichloropropene	.46349	.47204	.1	2	20	

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7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503663

Instrument ID: Voa104.i　　Calibration Date: 01-MAR-2015　Time: 08:32

Lab File ID: 0301A01　　Init. Calib. Date(s): 14-NOV-2　14-NOV-2

Sample No: 8260 CCAL　　Init. Calib. Times : 18:34　21:39

Compound	RRF (mean)	RRF	MIN RRF	%D	MAX %D	
1,1,2-trichloroethane	.23224	.23577	.1	2	20	
chlorodibromomethane	.34856	.3556	.1	2	20	
1,3-dichloropropane	.45928	.46467	.05	1	20	
1,2-dibromoethane	.28223	.27379	.1	-3	20	
2-hexanone	.19278	.19383	.1	1	20	
chlorobenzene	1.0010	1.0491	.5	5	20	
ethyl benzene	1.6393	1.7982	.1	10	20	
1,1,1,2-tetrachloroethane	.3581	.37272	.05	4	20	
p/m xylene	.63448	.7098	.1	12	20	
o xylene	.6125	.67307	.3	10	20	
styrene	1.0136	1.1073	.3	9	20	
bromoform	.39846	.39903	.1	0	20	
isopropylbenzene	3.1932	3.5527	.1	11	20	
bromobenzene	.84329	.86467	.05	3	20	
n-propylbenzene	3.6352	4.1635	.05	15	20	
1,1,2,2,-tetrachloroethane	.67812	.67442	.3	-1	20	
2-chlorotoluene	2.3296	2.5066	.05	8	20	
1,2,3-trichloropropane	.49557	.4974	.05	0	20	
1,3,5-trimethybenzene	2.6303	2.9559	.05	12	20	
4-chorotoluene	2.2427	2.4701	.05	10	20	
tert-butylbenzene	2.2838	2.5102	.05	10	20	
1,2,4-trimethylbenzene	2.6527	2.9535	.05	11	20	
sec-butylbenzene	3.4242	3.9372	.05	15	20	
p-isopropyltoluene	2.8275	3.2616	.05	15	20	
1,3-dichlorobenzene	1.5651	1.7179	.6	10	20	
1,4-dichlorobenzene	1.6000	1.6910	.5	6	20	
n-butylbenzene	2.4383	3.013	.05	24	20	F
1,2-dichlorobenzene	1.4443	1.5332	.4	6	20	
1,2-dibromo-3-chloropropane	.10573	.1002	.05	-5	20	
hexachlorobutadiene	.45607	.50105	.05	10	20	
1,2,4-trichlorobenzene	.95262	1.0366	.2	9	20	
naphthalene	2.1836	2.0481	.05	-6	20	
1,2,3-trichlorobenzene	.88772	.90999	.05	3	20	
dibromofluoromethane	.2538	.25881	.05	2	30	
1,2-dichloroethane-d4	.22706	.22722	.05	0	30	
toluene-d8	1.3076	1.3126	.05	0	30	
4-bromofluorobenzene	.90729	.92385	.05	2	30	

FORM VII MCP-8260HLW-10

ANALYTICAL REPORT

Lab Number:	L1503157
Client:	CDM Smith, Inc. 1 Cambridge Place 50 Hampshire Street Cambridge, MA 02139
ATTN:	Jay McMullen
Phone:	(617) 452-6303
Project Name:	KING OPEN SCHOOL
Project Number:	0139-107911
Report Date:	02/25/15

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

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

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1503157-01	CDM-4 1'-5'	SOIL	CAMBRIDGE, MA	02/19/15 13:00	02/19/15
L1503157-02	CDM-4 5'-8'	SOIL	CAMBRIDGE, MA	02/19/15 13:15	02/19/15

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

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).	YES
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)?	NO

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:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

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. All specific QC 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. 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 (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar 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. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Metals.

Volatile Organics

In reference to question G:

L1503157-02: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

The initial calibration, associated with L1503157-01 and -02, did not meet the method required minimum response factor on the lowest calibration standard for 4-methyl-2-pentanone (0.05631) and 1,4-dioxane (0.00244), as well as the average response factor for 2-butanone, 4-methyl-2-pentanone, and 1,4-dioxane.

The initial calibration verification is outside acceptance criteria for dichlorodifluoromethane (144%), but within overall method criteria.

The continuing calibration standard, associated with L1503157-01 and -02, is outside the acceptance criteria for several compounds; however, it is within overall method allowances. A copy of the continuing calibration standard is included as an addendum to this report.

Semivolatile Organics

In reference to question G:

L1503157-02: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

L1503157-02: The surrogate recoveries are below the acceptance criteria for 2-fluorophenol (0%), phenol-d6 (0%), nitrobenzene-d5 (0%), 2-fluorobiphenyl (0%), 2,4,6-tribromophenol (0%), and 4-terphenyl-d14 (0%) due to the dilution required to quantitate the sample. Re-extraction was not required; therefore, the results of the original analysis are reported.

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157
Project Number: 0139-107911 **Report Date:** 02/25/15

Case Narrative (continued)

EPH

In reference to question G:

L1503157-02: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

L1503157-02: The surrogate recoveries are below the acceptance criteria for chloro-octadecane (0%) and o-terphenyl (0%) due to the dilution required to quantitate the sample. Re-extraction was not required; therefore, the results of the original analysis are reported.

In reference to question I:

All samples were analyzed for a subset of MCP compounds per the Chain of Custody.

PCBs

In reference to question H:

The surrogate recoveries for the WG764521-2/-3 LCS/LCSD, associated with L1503157-02, are outside the acceptance criteria for 2,4,5,6-tetrachloro-m-xylene (0%) and decachlorobiphenyl (0%). The LCS/LCSD spike compounds are within overall method allowances; therefore, no further action was taken.

Metals

In reference to question I:

All samples were analyzed for a subset of MCP elements per the Chain of Custody.

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: 02/25/15

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ORGANICS

VOLATILES

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157
Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-01	Date Collected:	02/19/15 13:00
Client ID:	CDM-4 1'-5'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Analytical Method:	97,8260C		
Analytical Date:	02/23/15 11:36		
Analyst:	BN		
Percent Solids:	88%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	21	--	1
1,1-Dichloroethane	ND		ug/kg	3.2	--	1
Chloroform	ND		ug/kg	3.2	--	1
Carbon tetrachloride	ND		ug/kg	2.1	--	1
1,2-Dichloropropane	ND		ug/kg	7.4	--	1
Dibromochloromethane	ND		ug/kg	2.1	--	1
1,1,2-Trichloroethane	ND		ug/kg	3.2	--	1
Tetrachloroethene	ND		ug/kg	2.1	--	1
Chlorobenzene	ND		ug/kg	2.1	--	1
Trichlorofluoromethane	ND		ug/kg	8.4	--	1
1,2-Dichloroethane	ND		ug/kg	2.1	--	1
1,1,1-Trichloroethane	ND		ug/kg	2.1	--	1
Bromodichloromethane	ND		ug/kg	2.1	--	1
trans-1,3-Dichloropropene	ND		ug/kg	2.1	--	1
cis-1,3-Dichloropropene	ND		ug/kg	2.1	--	1
1,3-Dichloropropene, Total	ND		ug/kg	2.1	--	1
1,1-Dichloropropene	ND		ug/kg	8.4	--	1
Bromoform	ND		ug/kg	8.4	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	2.1	--	1
Benzene	ND		ug/kg	2.1	--	1
Toluene	ND		ug/kg	3.2	--	1
Ethylbenzene	ND		ug/kg	2.1	--	1
Chloromethane	ND		ug/kg	8.4	--	1
Bromomethane	ND		ug/kg	4.2	--	1
Vinyl chloride	ND		ug/kg	4.2	--	1
Chloroethane	ND		ug/kg	4.2	--	1
1,1-Dichloroethene	ND		ug/kg	2.1	--	1
trans-1,2-Dichloroethene	ND		ug/kg	3.2	--	1
Trichloroethene	ND		ug/kg	2.1	--	1
1,2-Dichlorobenzene	ND		ug/kg	8.4	--	1

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-01	Date Collected:	02/19/15 13:00
Client ID:	CDM-4 1'-5'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	8.4	--	1
1,4-Dichlorobenzene	ND		ug/kg	8.4	--	1
Methyl tert butyl ether	ND		ug/kg	4.2	--	1
p/m-Xylene	ND		ug/kg	4.2	--	1
o-Xylene	ND		ug/kg	4.2	--	1
Xylenes, Total	ND		ug/kg	4.2	--	1
cis-1,2-Dichloroethene	ND		ug/kg	2.1	--	1
1,2-Dichloroethene, Total	ND		ug/kg	2.1	--	1
Dibromomethane	ND		ug/kg	8.4	--	1
1,2,3-Trichloropropane	ND		ug/kg	8.4	--	1
Styrene	ND		ug/kg	4.2	--	1
Dichlorodifluoromethane	ND		ug/kg	21	--	1
Acetone	140		ug/kg	76	--	1
Carbon disulfide	ND		ug/kg	8.4	--	1
Methyl ethyl ketone	28		ug/kg	21	--	1
Methyl isobutyl ketone	ND		ug/kg	21	--	1
2-Hexanone	ND		ug/kg	21	--	1
Bromochloromethane	ND		ug/kg	8.4	--	1
Tetrahydrofuran	ND		ug/kg	8.4	--	1
2,2-Dichloropropane	ND		ug/kg	10	--	1
1,2-Dibromoethane	ND		ug/kg	8.4	--	1
1,3-Dichloropropane	ND		ug/kg	8.4	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	2.1	--	1
Bromobenzene	ND		ug/kg	10	--	1
n-Butylbenzene	ND		ug/kg	2.1	--	1
sec-Butylbenzene	ND		ug/kg	2.1	--	1
tert-Butylbenzene	ND		ug/kg	8.4	--	1
o-Chlorotoluene	ND		ug/kg	8.4	--	1
p-Chlorotoluene	ND		ug/kg	8.4	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	8.4	--	1
Hexachlorobutadiene	ND		ug/kg	8.4	--	1
Isopropylbenzene	ND		ug/kg	2.1	--	1
p-Isopropyltoluene	ND		ug/kg	2.1	--	1
Naphthalene	ND		ug/kg	8.4	--	1
n-Propylbenzene	ND		ug/kg	2.1	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	8.4	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	8.4	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	8.4	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	8.4	--	1

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Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-01	Date Collected:	02/19/15 13:00
Client ID:	CDM-4 1'-5'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	10	--	1
Diisopropyl Ether	ND		ug/kg	8.4	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	8.4	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	8.4	--	1
1,4-Dioxane	ND		ug/kg	84	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	102		70-130
Toluene-d8	103		70-130
4-Bromofluorobenzene	109		70-130
Dibromofluoromethane	104		70-130

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-02 D		Date Collected:	02/19/15 13:15
Client ID:	CDM-4 5'-8'		Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA		Field Prep:	Not Specified
Matrix:	Soil			
Analytical Method:	97,8260C			
Analytical Date:	02/23/15 14:40			
Analyst:	BN			
Percent Solids:	71%			

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	4900	--	4
1,1-Dichloroethane	ND		ug/kg	730	--	4
Chloroform	ND		ug/kg	730	--	4
Carbon tetrachloride	ND		ug/kg	490	--	4
1,2-Dichloropropane	ND		ug/kg	1700	--	4
Dibromochloromethane	ND		ug/kg	490	--	4
1,1,2-Trichloroethane	ND		ug/kg	730	--	4
Tetrachloroethene	ND		ug/kg	490	--	4
Chlorobenzene	ND		ug/kg	490	--	4
Trichlorofluoromethane	ND		ug/kg	2000	--	4
1,2-Dichloroethane	ND		ug/kg	490	--	4
1,1,1-Trichloroethane	ND		ug/kg	490	--	4
Bromodichloromethane	ND		ug/kg	490	--	4
trans-1,3-Dichloropropene	ND		ug/kg	490	--	4
cis-1,3-Dichloropropene	ND		ug/kg	490	--	4
1,3-Dichloropropene, Total	ND		ug/kg	490	--	4
1,1-Dichloropropene	ND		ug/kg	2000	--	4
Bromoform	ND		ug/kg	2000	--	4
1,1,2,2-Tetrachloroethane	ND		ug/kg	490	--	4
Benzene	ND		ug/kg	490	--	4
Toluene	ND		ug/kg	730	--	4
Ethylbenzene	ND		ug/kg	490	--	4
Chloromethane	ND		ug/kg	2000	--	4
Bromomethane	ND		ug/kg	980	--	4
Vinyl chloride	ND		ug/kg	980	--	4
Chloroethane	ND		ug/kg	980	--	4
1,1-Dichloroethene	ND		ug/kg	490	--	4
trans-1,2-Dichloroethene	ND		ug/kg	730	--	4
Trichloroethene	ND		ug/kg	490	--	4
1,2-Dichlorobenzene	ND		ug/kg	2000	--	4

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-02	D	Date Collected:	02/19/15 13:15
Client ID:	CDM-4 5'-8'		Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA		Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	2000	--	4
1,4-Dichlorobenzene	ND		ug/kg	2000	--	4
Methyl tert butyl ether	ND		ug/kg	980	--	4
p/m-Xylene	ND		ug/kg	980	--	4
o-Xylene	ND		ug/kg	980	--	4
Xylenes, Total	ND		ug/kg	980	--	4
cis-1,2-Dichloroethene	ND		ug/kg	490	--	4
1,2-Dichloroethene, Total	ND		ug/kg	490	--	4
Dibromomethane	ND		ug/kg	2000	--	4
1,2,3-Trichloropropane	ND		ug/kg	2000	--	4
Styrene	ND		ug/kg	980	--	4
Dichlorodifluoromethane	ND		ug/kg	4900	--	4
Acetone	ND		ug/kg	18000	--	4
Carbon disulfide	ND		ug/kg	2000	--	4
Methyl ethyl ketone	ND		ug/kg	4900	--	4
Methyl isobutyl ketone	ND		ug/kg	4900	--	4
2-Hexanone	ND		ug/kg	4900	--	4
Bromochloromethane	ND		ug/kg	2000	--	4
Tetrahydrofuran	ND		ug/kg	2000	--	4
2,2-Dichloropropane	ND		ug/kg	2400	--	4
1,2-Dibromoethane	ND		ug/kg	2000	--	4
1,3-Dichloropropane	ND		ug/kg	2000	--	4
1,1,1,2-Tetrachloroethane	ND		ug/kg	490	--	4
Bromobenzene	ND		ug/kg	2400	--	4
n-Butylbenzene	ND		ug/kg	490	--	4
sec-Butylbenzene	ND		ug/kg	490	--	4
tert-Butylbenzene	ND		ug/kg	2000	--	4
o-Chlorotoluene	ND		ug/kg	2000	--	4
p-Chlorotoluene	ND		ug/kg	2000	--	4
1,2-Dibromo-3-chloropropane	ND		ug/kg	2000	--	4
Hexachlorobutadiene	ND		ug/kg	2000	--	4
Isopropylbenzene	ND		ug/kg	490	--	4
p-Isopropyltoluene	ND		ug/kg	490	--	4
Naphthalene	53000		ug/kg	2000	--	4
n-Propylbenzene	ND		ug/kg	490	--	4
1,2,3-Trichlorobenzene	ND		ug/kg	2000	--	4
1,2,4-Trichlorobenzene	ND		ug/kg	2000	--	4
1,3,5-Trimethylbenzene	ND		ug/kg	2000	--	4
1,2,4-Trimethylbenzene	ND		ug/kg	2000	--	4

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-02	D	Date Collected:	02/19/15 13:15
Client ID:	CDM-4 5'-8'		Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA		Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	2400	--	4
Diisopropyl Ether	ND		ug/kg	2000	--	4
Ethyl-Tert-Butyl-Ether	ND		ug/kg	2000	--	4
Tertiary-Amyl Methyl Ether	ND		ug/kg	2000	--	4
1,4-Dioxane	ND		ug/kg	49000	--	4

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	104		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	104		70-130

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/23/15 10:18
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01 Batch: WG764426-3					
Methylene chloride	ND		ug/kg	10	--
1,1-Dichloroethane	ND		ug/kg	1.5	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	3.5	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.5	--
Tetrachloroethene	ND		ug/kg	1.0	--
Chlorobenzene	ND		ug/kg	1.0	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	1.0	--
Bromodichloromethane	ND		ug/kg	1.0	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	1.0	--
1,3-Dichloropropene, Total	ND		ug/kg	1.0	--
1,1-Dichloropropene	ND		ug/kg	4.0	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	--
Benzene	ND		ug/kg	1.0	--
Toluene	ND		ug/kg	1.5	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	2.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	1.0	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157
Project Number: 0139-107911 **Report Date:** 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/23/15 10:18
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01 Batch: WG764426-3					
1,2-Dichlorobenzene	ND		ug/kg	4.0	--
1,3-Dichlorobenzene	ND		ug/kg	4.0	--
1,4-Dichlorobenzene	ND		ug/kg	4.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	2.0	--
Xylenes, Total	ND		ug/kg	2.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	4.0	--
1,2,3-Trichloropropane	ND		ug/kg	4.0	--
Styrene	ND		ug/kg	2.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	36	--
Carbon disulfide	ND		ug/kg	4.0	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	4.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	5.0	--
1,2-Dibromoethane	ND		ug/kg	4.0	--
1,3-Dichloropropane	ND		ug/kg	4.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	--
Bromobenzene	ND		ug/kg	5.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	4.0	--
o-Chlorotoluene	ND		ug/kg	4.0	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157
Project Number: 0139-107911 **Report Date:** 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/23/15 10:18
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01 Batch: WG764426-3					
p-Chlorotoluene	ND		ug/kg	4.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	4.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	4.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	4.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	4.0	--
Diethyl ether	ND		ug/kg	5.0	--
Diisopropyl Ether	ND		ug/kg	4.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	4.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	4.0	--
1,4-Dioxane	ND		ug/kg	40	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	103		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157
Project Number: 0139-107911 **Report Date:** 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/23/15 10:18
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02 Batch: WG764427-3					
Methylene chloride	ND		ug/kg	500	--
1,1-Dichloroethane	ND		ug/kg	75	--
Chloroform	ND		ug/kg	75	--
Carbon tetrachloride	ND		ug/kg	50	--
1,2-Dichloropropane	ND		ug/kg	180	--
Dibromochloromethane	ND		ug/kg	50	--
1,1,2-Trichloroethane	ND		ug/kg	75	--
Tetrachloroethene	ND		ug/kg	50	--
Chlorobenzene	ND		ug/kg	50	--
Trichlorofluoromethane	ND		ug/kg	200	--
1,2-Dichloroethane	ND		ug/kg	50	--
1,1,1-Trichloroethane	ND		ug/kg	50	--
Bromodichloromethane	ND		ug/kg	50	--
trans-1,3-Dichloropropene	ND		ug/kg	50	--
cis-1,3-Dichloropropene	ND		ug/kg	50	--
1,3-Dichloropropene, Total	ND		ug/kg	50	--
1,1-Dichloropropene	ND		ug/kg	200	--
Bromoform	ND		ug/kg	200	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	50	--
Benzene	ND		ug/kg	50	--
Toluene	ND		ug/kg	75	--
Ethylbenzene	ND		ug/kg	50	--
Chloromethane	ND		ug/kg	200	--
Bromomethane	ND		ug/kg	100	--
Vinyl chloride	ND		ug/kg	100	--
Chloroethane	ND		ug/kg	100	--
1,1-Dichloroethene	ND		ug/kg	50	--
trans-1,2-Dichloroethene	ND		ug/kg	75	--
Trichloroethene	ND		ug/kg	50	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157
Project Number: 0139-107911 **Report Date:** 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/23/15 10:18
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02 Batch: WG764427-3					
1,2-Dichlorobenzene	ND		ug/kg	200	--
1,3-Dichlorobenzene	ND		ug/kg	200	--
1,4-Dichlorobenzene	ND		ug/kg	200	--
Methyl tert butyl ether	ND		ug/kg	100	--
p/m-Xylene	ND		ug/kg	100	--
o-Xylene	ND		ug/kg	100	--
Xylenes, Total	ND		ug/kg	100	--
cis-1,2-Dichloroethene	ND		ug/kg	50	--
1,2-Dichloroethene, Total	ND		ug/kg	50	--
Dibromomethane	ND		ug/kg	200	--
1,2,3-Trichloropropane	ND		ug/kg	200	--
Styrene	ND		ug/kg	100	--
Dichlorodifluoromethane	ND		ug/kg	500	--
Acetone	ND		ug/kg	1800	--
Carbon disulfide	ND		ug/kg	200	--
Methyl ethyl ketone	ND		ug/kg	500	--
Methyl isobutyl ketone	ND		ug/kg	500	--
2-Hexanone	ND		ug/kg	500	--
Bromochloromethane	ND		ug/kg	200	--
Tetrahydrofuran	ND		ug/kg	200	--
2,2-Dichloropropane	ND		ug/kg	250	--
1,2-Dibromoethane	ND		ug/kg	200	--
1,3-Dichloropropane	ND		ug/kg	200	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	50	--
Bromobenzene	ND		ug/kg	250	--
n-Butylbenzene	ND		ug/kg	50	--
sec-Butylbenzene	ND		ug/kg	50	--
tert-Butylbenzene	ND		ug/kg	200	--
o-Chlorotoluene	ND		ug/kg	200	--

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Project Name: KING OPEN SCHOOL | **Lab Number:** L1503157
Project Number: 0139-107911 | **Report Date:** 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/23/15 10:18
Analyst: BN

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02 Batch: WG764427-3					
p-Chlorotoluene	ND		ug/kg	200	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	200	--
Hexachlorobutadiene	ND		ug/kg	200	--
Isopropylbenzene	ND		ug/kg	50	--
p-Isopropyltoluene	ND		ug/kg	50	--
Naphthalene	ND		ug/kg	200	--
n-Propylbenzene	ND		ug/kg	50	--
1,2,3-Trichlorobenzene	ND		ug/kg	200	--
1,2,4-Trichlorobenzene	ND		ug/kg	200	--
1,3,5-Trimethylbenzene	ND		ug/kg	200	--
1,2,4-Trimethylbenzene	ND		ug/kg	200	--
Diethyl ether	ND		ug/kg	250	--
Diisopropyl Ether	ND		ug/kg	200	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	200	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	200	--
1,4-Dioxane	ND		ug/kg	5000	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	103		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01 Batch: WG764426-1 WG764426-2								
Methylene chloride	96		97		70-130	1		20
1,1-Dichloroethane	97		97		70-130	0		20
Chloroform	99		99		70-130	0		20
Carbon tetrachloride	92		92		70-130	0		20
1,2-Dichloropropane	100		101		70-130	1		20
Dibromochloromethane	97		96		70-130	1		20
1,1,2-Trichloroethane	99		96		70-130	3		20
Tetrachloroethene	101		99		70-130	2		20
Chlorobenzene	102		99		70-130	3		20
Trichlorofluoromethane	89		88		70-130	1		20
1,2-Dichloroethane	94		96		70-130	2		20
1,1,1-Trichloroethane	95		95		70-130	0		20
Bromodichloromethane	100		101		70-130	1		20
trans-1,3-Dichloropropene	100		98		70-130	2		20
cis-1,3-Dichloropropene	100		101		70-130	1		20
1,1-Dichloropropene	95		95		70-130	0		20
Bromoform	97		95		70-130	2		20
1,1,2,2-Tetrachloroethane	99		93		70-130	6		20
Benzene	97		98		70-130	1		20
Toluene	100		99		70-130	1		20
Ethylbenzene	105		104		70-130	1		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157
Project Number: 0139-107911 **Report Date:** 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01 Batch: WG764426-1 WG764426-2								
Chloromethane	90		86		70-130	5		20
Bromomethane	93		86		70-130	8		20
Vinyl chloride	88		88		70-130	0		20
Chloroethane	103		102		70-130	1		20
1,1-Dichloroethene	79		78		70-130	1		20
trans-1,2-Dichloroethene	95		94		70-130	1		20
Trichloroethene	100		100		70-130	0		20
1,2-Dichlorobenzene	103		100		70-130	3		20
1,3-Dichlorobenzene	106		105		70-130	1		20
1,4-Dichlorobenzene	104		102		70-130	2		20
Methyl tert butyl ether	94		93		70-130	1		20
p/m-Xylene	107		105		70-130	2		20
o-Xylene	105		105		70-130	0		20
cis-1,2-Dichloroethene	98		97		70-130	1		20
Dibromomethane	94		93		70-130	1		20
1,2,3-Trichloropropane	97		94		70-130	3		20
Styrene	105		104		70-130	1		20
Dichlorodifluoromethane	72		71		70-130	1		20
Acetone	111		102		70-130	8		20
Carbon disulfide	80		78		70-130	3		20
Methyl ethyl ketone	105		97		70-130	8		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01 Batch: WG764426-1 WG764426-2								
Methyl isobutyl ketone	99		94		70-130	5		20
2-Hexanone	102		90		70-130	13		20
Bromochloromethane	95		96		70-130	1		20
Tetrahydrofuran	98		92		70-130	6		20
2,2-Dichloropropane	97		95		70-130	2		20
1,2-Dibromoethane	95		93		70-130	2		20
1,3-Dichloropropane	99		97		70-130	2		20
1,1,1,2-Tetrachloroethane	102		101		70-130	1		20
Bromobenzene	100		99		70-130	1		20
n-Butylbenzene	113		112		70-130	1		20
sec-Butylbenzene	104		103		70-130	1		20
tert-Butylbenzene	103		102		70-130	1		20
o-Chlorotoluene	103		102		70-130	1		20
p-Chlorotoluene	107		105		70-130	2		20
1,2-Dibromo-3-chloropropane	92		87		70-130	6		20
Hexachlorobutadiene	104		102		70-130	2		20
Isopropylbenzene	104		103		70-130	1		20
p-Isopropyltoluene	107		106		70-130	1		20
Naphthalene	92		88		70-130	4		20
n-Propylbenzene	107		106		70-130	1		20
1,2,3-Trichlorobenzene	101		99		70-130	2		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01 Batch: WG764426-1 WG764426-2								
1,2,4-Trichlorobenzene	108		105		70-130	3		20
1,3,5-Trimethylbenzene	107		105		70-130	2		20
1,2,4-Trimethylbenzene	107		106		70-130	1		20
Diethyl ether	102		100		70-130	2		20
Diisopropyl Ether	101		102		70-130	1		20
Ethyl-Tert-Butyl-Ether	97		97		70-130	0		20
Tertiary-Amyl Methyl Ether	96		95		70-130	1		20
1,4-Dioxane	92		83		70-130	10		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	97		97		70-130
Toluene-d8	102		101		70-130
4-Bromofluorobenzene	104		101		70-130
Dibromofluoromethane	101		101		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02 Batch: WG764427-1 WG764427-2								
Methylene chloride	96		97		70-130	1		20
1,1-Dichloroethane	97		97		70-130	0		20
Chloroform	99		99		70-130	0		20
Carbon tetrachloride	92		92		70-130	0		20
1,2-Dichloropropane	100		101		70-130	1		20
Dibromochloromethane	97		96		70-130	1		20
1,1,2-Trichloroethane	99		96		70-130	3		20
Tetrachloroethene	101		99		70-130	2		20
Chlorobenzene	102		99		70-130	3		20
Trichlorofluoromethane	89		88		70-130	1		20
1,2-Dichloroethane	94		96		70-130	2		20
1,1,1-Trichloroethane	95		95		70-130	0		20
Bromodichloromethane	100		101		70-130	1		20
trans-1,3-Dichloropropene	100		98		70-130	2		20
cis-1,3-Dichloropropene	100		101		70-130	1		20
1,1-Dichloropropene	95		95		70-130	0		20
Bromoform	97		95		70-130	2		20
1,1,2,2-Tetrachloroethane	99		93		70-130	6		20
Benzene	97		98		70-130	1		20
Toluene	100		99		70-130	1		20
Ethylbenzene	105		104		70-130	1		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02 Batch: WG764427-1 WG764427-2								
Chloromethane	90		86		70-130	5		20
Bromomethane	93		86		70-130	8		20
Vinyl chloride	88		88		70-130	0		20
Chloroethane	103		102		70-130	1		20
1,1-Dichloroethene	79		78		70-130	1		20
trans-1,2-Dichloroethene	95		94		70-130	1		20
Trichloroethene	100		100		70-130	0		20
1,2-Dichlorobenzene	103		100		70-130	3		20
1,3-Dichlorobenzene	106		105		70-130	1		20
1,4-Dichlorobenzene	104		102		70-130	2		20
Methyl tert butyl ether	94		93		70-130	1		20
p/m-Xylene	107		105		70-130	2		20
o-Xylene	105		105		70-130	0		20
cis-1,2-Dichloroethene	98		97		70-130	1		20
Dibromomethane	94		93		70-130	1		20
1,2,3-Trichloropropane	97		94		70-130	3		20
Styrene	105		104		70-130	1		20
Dichlorodifluoromethane	72		71		70-130	1		20
Acetone	111		102		70-130	8		20
Carbon disulfide	80		78		70-130	3		20
Methyl ethyl ketone	105		97		70-130	8		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02 Batch: WG764427-1 WG764427-2								
Methyl isobutyl ketone	99		94		70-130	5		20
2-Hexanone	102		90		70-130	13		20
Bromochloromethane	95		96		70-130	1		20
Tetrahydrofuran	98		92		70-130	6		20
2,2-Dichloropropane	97		95		70-130	2		20
1,2-Dibromoethane	95		93		70-130	2		20
1,3-Dichloropropane	99		97		70-130	2		20
1,1,1,2-Tetrachloroethane	102		101		70-130	1		20
Bromobenzene	100		99		70-130	1		20
n-Butylbenzene	113		112		70-130	1		20
sec-Butylbenzene	104		103		70-130	1		20
tert-Butylbenzene	103		102		70-130	1		20
o-Chlorotoluene	103		102		70-130	1		20
p-Chlorotoluene	107		105		70-130	2		20
1,2-Dibromo-3-chloropropane	92		87		70-130	6		20
Hexachlorobutadiene	104		102		70-130	2		20
Isopropylbenzene	104		103		70-130	1		20
p-Isopropyltoluene	107		106		70-130	1		20
Naphthalene	92		88		70-130	4		20
n-Propylbenzene	107		106		70-130	1		20
1,2,3-Trichlorobenzene	101		99		70-130	2		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02 Batch: WG764427-1 WG764427-2								
1,2,4-Trichlorobenzene	108		105		70-130	3		20
1,3,5-Trimethylbenzene	107		105		70-130	2		20
1,2,4-Trimethylbenzene	107		106		70-130	1		20
Diethyl ether	102		100		70-130	2		20
Diisopropyl Ether	101		102		70-130	1		20
Ethyl-Tert-Butyl-Ether	97		97		70-130	0		20
Tertiary-Amyl Methyl Ether	96		95		70-130	1		20
1,4-Dioxane	92		83		70-130	10		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	97		97		70-130
Toluene-d8	102		101		70-130
4-Bromofluorobenzene	104		101		70-130
Dibromofluoromethane	100		100		70-130

SEMIVOLATILES

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-01	Date Collected:	02/19/15 13:00
Client ID:	CDM-4 1'-5'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/20/15 07:59
Analytical Date:	02/20/15 20:10		
Analyst:	AS		
Percent Solids:	88%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	--	1
2-Chloronaphthalene	ND		ug/kg	190	--	1
1,2-Dichlorobenzene	ND		ug/kg	190	--	1
1,3-Dichlorobenzene	ND		ug/kg	190	--	1
1,4-Dichlorobenzene	ND		ug/kg	190	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	--	1
2,4-Dinitrotoluene	ND		ug/kg	190	--	1
2,6-Dinitrotoluene	ND		ug/kg	190	--	1
Azobenzene	ND		ug/kg	190	--	1
Fluoranthene	280		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	--	1
Hexachlorobutadiene	ND		ug/kg	190	--	1
Hexachloroethane	ND		ug/kg	150	--	1
Isophorone	ND		ug/kg	170	--	1
Naphthalene	ND		ug/kg	190	--	1
Nitrobenzene	ND		ug/kg	170	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	190	--	1
Butyl benzyl phthalate	ND		ug/kg	190	--	1
Di-n-butylphthalate	ND		ug/kg	190	--	1
Di-n-octylphthalate	ND		ug/kg	190	--	1
Diethyl phthalate	ND		ug/kg	190	--	1
Dimethyl phthalate	ND		ug/kg	190	--	1
Benzo(a)anthracene	150		ug/kg	110	--	1
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	160		ug/kg	110	--	1

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503157

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-01	Date Collected:	02/19/15 13:00
Client ID:	CDM-4 1'-5'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	140		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	240		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	150	--	1
Pyrene	270		ug/kg	110	--	1
Aniline	ND		ug/kg	220	--	1
4-Chloroaniline	ND		ug/kg	190	--	1
Dibenzofuran	ND		ug/kg	190	--	1
2-Methylnaphthalene	ND		ug/kg	220	--	1
Acetophenone	ND		ug/kg	190	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	190	--	1
2,4-Dichlorophenol	ND		ug/kg	170	--	1
2,4-Dimethylphenol	ND		ug/kg	190	--	1
2-Nitrophenol	ND		ug/kg	400	--	1
4-Nitrophenol	ND		ug/kg	260	--	1
2,4-Dinitrophenol	ND		ug/kg	900	--	1
Pentachlorophenol	ND		ug/kg	380	--	1
Phenol	ND		ug/kg	190	--	1
2-Methylphenol	ND		ug/kg	190	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	--	1
2,4,5-Trichlorophenol	ND		ug/kg	190	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	90		30-130
Phenol-d6	98		30-130
Nitrobenzene-d5	95		30-130
2-Fluorobiphenyl	94		30-130
2,4,6-Tribromophenol	**132**	Q	30-130
4-Terphenyl-d14	66		30-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-02 D2	Date Collected:	02/19/15 13:15
Client ID:	CDM-4 5'-8'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/20/15 07:59
Analytical Date:	02/23/15 17:51		
Analyst:	AS		
Percent Solids:	71%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Fluoranthene	200000		ug/kg	14000	--	100
Phenanthrene	290000		ug/kg	14000	--	100
Pyrene	180000		ug/kg	14000	--	100

Project Name: KING OPEN SCHOOL | **Lab Number:** L1503157

Project Number: 0139-107911 | **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-02 D	Date Collected:	02/19/15 13:15
Client ID:	CDM-4 5'-8'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/20/15 07:59
Analytical Date:	02/23/15 18:16		
Analyst:	AS		
Percent Solids:	71%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	42000		ug/kg	3700	--	20
1,2,4-Trichlorobenzene	ND		ug/kg	4600	--	20
Hexachlorobenzene	ND		ug/kg	2800	--	20
Bis(2-chloroethyl)ether	ND		ug/kg	4200	--	20
2-Chloronaphthalene	ND		ug/kg	4600	--	20
1,2-Dichlorobenzene	ND		ug/kg	4600	--	20
1,3-Dichlorobenzene	ND		ug/kg	4600	--	20
1,4-Dichlorobenzene	ND		ug/kg	4600	--	20
3,3'-Dichlorobenzidine	ND		ug/kg	4600	--	20
2,4-Dinitrotoluene	ND		ug/kg	4600	--	20
2,6-Dinitrotoluene	ND		ug/kg	4600	--	20
Azobenzene	ND		ug/kg	4600	--	20
Fluoranthene	210000	E	ug/kg	2800	--	20
4-Bromophenyl phenyl ether	ND		ug/kg	4600	--	20
Bis(2-chloroisopropyl)ether	ND		ug/kg	5500	--	20
Bis(2-chloroethoxy)methane	ND		ug/kg	5000	--	20
Hexachlorobutadiene	ND		ug/kg	4600	--	20
Hexachloroethane	ND		ug/kg	3700	--	20
Isophorone	ND		ug/kg	4200	--	20
Naphthalene	95000		ug/kg	4600	--	20
Nitrobenzene	ND		ug/kg	4200	--	20
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	4600	--	20
Butyl benzyl phthalate	ND		ug/kg	4600	--	20
Di-n-butylphthalate	ND		ug/kg	4600	--	20
Di-n-octylphthalate	ND		ug/kg	4600	--	20
Diethyl phthalate	ND		ug/kg	4600	--	20
Dimethyl phthalate	ND		ug/kg	4600	--	20
Benzo(a)anthracene	96000		ug/kg	2800	--	20
Benzo(a)pyrene	79000		ug/kg	3700	--	20
Benzo(b)fluoranthene	92000		ug/kg	2800	--	20

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-02	D	Date Collected:	02/19/15 13:15
Client ID:	CDM-4 5'-8'		Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA		Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	34000		ug/kg	2800	--	20
Chrysene	84000		ug/kg	2800	--	20
Acenaphthylene	18000		ug/kg	3700	--	20
Anthracene	91000		ug/kg	2800	--	20
Benzo(ghi)perylene	34000		ug/kg	3700	--	20
Fluorene	60000		ug/kg	4600	--	20
Phenanthrene	310000	E	ug/kg	2800	--	20
Dibenzo(a,h)anthracene	9600		ug/kg	2800	--	20
Indeno(1,2,3-cd)Pyrene	39000		ug/kg	3700	--	20
Pyrene	190000	E	ug/kg	2800	--	20
Aniline	ND		ug/kg	5500	--	20
4-Chloroaniline	ND		ug/kg	4600	--	20
Dibenzofuran	42000		ug/kg	4600	--	20
2-Methylnaphthalene	34000		ug/kg	5500	--	20
Acetophenone	ND		ug/kg	4600	--	20
2,4,6-Trichlorophenol	ND		ug/kg	2800	--	20
2-Chlorophenol	ND		ug/kg	4600	--	20
2,4-Dichlorophenol	ND		ug/kg	4200	--	20
2,4-Dimethylphenol	ND		ug/kg	4600	--	20
2-Nitrophenol	ND		ug/kg	10000	--	20
4-Nitrophenol	ND		ug/kg	6500	--	20
2,4-Dinitrophenol	ND		ug/kg	22000	--	20
Pentachlorophenol	ND		ug/kg	9200	--	20
Phenol	ND		ug/kg	4600	--	20
2-Methylphenol	ND		ug/kg	4600	--	20
3-Methylphenol/4-Methylphenol	ND		ug/kg	6600	--	20
2,4,5-Trichlorophenol	ND		ug/kg	4600	--	20

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	**0**	Q	30-130
Phenol-d6	**0**	Q	30-130
Nitrobenzene-d5	**0**	Q	30-130
2-Fluorobiphenyl	**0**	Q	30-130
2,4,6-Tribromophenol	**0**	Q	30-130
4-Terphenyl-d14	**0**	Q	30-130

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/20/15 17:35
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 02/20/15 07:59

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG763787-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	98	--
Bis(2-chloroethyl)ether	ND		ug/kg	150	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	160	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	160	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	98	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	130	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/20/15 17:35
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 02/20/15 07:59

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG763787-1					
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	98	--
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	200	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	98	--
2-Chlorophenol	ND		ug/kg	160	--
2,4-Dichlorophenol	ND		ug/kg	150	--
2,4-Dimethylphenol	ND		ug/kg	160	--
2-Nitrophenol	ND		ug/kg	350	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	780	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	230	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/20/15 17:35
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 02/20/15 07:59

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG763787-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	54		30-130
Phenol-d6	58		30-130
Nitrobenzene-d5	54		30-130
2-Fluorobiphenyl	66		30-130
2,4,6-Tribromophenol	92		30-130
4-Terphenyl-d14	89		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763787-2 WG763787-3								
Acenaphthene	104		97		40-140	7		30
1,2,4-Trichlorobenzene	96		81		40-140	17		30
Hexachlorobenzene	107		100		40-140	7		30
Bis(2-chloroethyl)ether	91		75		40-140	19		30
2-Chloronaphthalene	107		97		40-140	10		30
1,2-Dichlorobenzene	87		71		40-140	20		30
1,3-Dichlorobenzene	87		71		40-140	20		30
1,4-Dichlorobenzene	87		72		40-140	19		30
3,3'-Dichlorobenzidine	84		60		40-140	**33**	Q	30
2,4-Dinitrotoluene	114		102		40-140	11		30
2,6-Dinitrotoluene	115		104		40-140	10		30
Azobenzene	113		101		40-140	11		30
Fluoranthene	110		101		40-140	9		30
4-Bromophenyl phenyl ether	114		105		40-140	8		30
Bis(2-chloroisopropyl)ether	93		78		40-140	18		30
Bis(2-chloroethoxy)methane	97		90		40-140	7		30
Hexachlorobutadiene	95		81		40-140	16		30
Hexachloroethane	90		73		40-140	21		30
Isophorone	102		90		40-140	13		30
Naphthalene	96		84		40-140	13		30
Nitrobenzene	99		87		40-140	13		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763787-2 WG763787-3								
Bis(2-Ethylhexyl)phthalate	119		114		40-140	4		30
Butyl benzyl phthalate	114		106		40-140	7		30
Di-n-butylphthalate	116		108		40-140	7		30
Di-n-octylphthalate	127		120		40-140	6		30
Diethyl phthalate	113		104		40-140	8		30
Dimethyl phthalate	110		99		40-140	11		30
Benzo(a)anthracene	114		106		40-140	7		30
Benzo(a)pyrene	117		108		40-140	8		30
Benzo(b)fluoranthene	116		109		40-140	6		30
Benzo(k)fluoranthene	117		107		40-140	9		30
Chrysene	108		101		40-140	7		30
Acenaphthylene	109		100		40-140	9		30
Anthracene	113		103		40-140	9		30
Benzo(ghi)perylene	111		102		40-140	8		30
Fluorene	111		101		40-140	9		30
Phenanthrene	108		101		40-140	7		30
Dibenzo(a,h)anthracene	111		104		40-140	7		30
Indeno(1,2,3-cd)Pyrene	115		110		40-140	4		30
Pyrene	110		100		40-140	10		30
Aniline	76		43		40-140	**55**	Q	30
4-Chloroaniline	118		62		40-140	**62**	Q	30

375

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763787-2 WG763787-3								
Dibenzofuran	107		98		40-140	9		30
2-Methylnaphthalene	100		91		40-140	9		30
Acetophenone	100		88		40-140	13		30
2,4,6-Trichlorophenol	118		106		30-130	11		30
2-Chlorophenol	100		84		30-130	17		30
2,4-Dichlorophenol	117		104		30-130	12		30
2,4-Dimethylphenol	112		101		30-130	10		30
2-Nitrophenol	105		91		30-130	14		30
4-Nitrophenol	**138**	Q	128		30-130	8		30
2,4-Dinitrophenol	94		82		30-130	14		30
Pentachlorophenol	122		107		30-130	13		30
Phenol	100		85		30-130	16		30
2-Methylphenol	106		93		30-130	13		30
3-Methylphenol/4-Methylphenol	108		99		30-130	9		30
2,4,5-Trichlorophenol	117		107		30-130	9		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL

Lab Number: L1503157

Project Number: 0139-107911

Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763787-2 WG763787-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	99		86		30-130
Phenol-d6	106		97		30-130
Nitrobenzene-d5	103		90		30-130
2-Fluorobiphenyl	107		97		30-130
2,4,6-Tribromophenol	122		115		30-130
4-Terphenyl-d14	108		101		30-130

PETROLEUM HYDROCARBONS

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-01	Date Collected:	02/19/15 13:00
Client ID:	CDM-4 1'-5'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/21/15 12:20
Analytical Date:	02/23/15 18:02	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/22/15
Percent Solids:	88%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	7.24	--	1
C19-C36 Aliphatics	ND		mg/kg	7.24	--	1
C11-C22 Aromatics	32.7		mg/kg	7.24	--	1
C11-C22 Aromatics, Adjusted	28.7		mg/kg	7.24	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	65		40-140
o-Terphenyl	65		40-140
2-Fluorobiphenyl	78		40-140
2-Bromonaphthalene	73		40-140

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-02 D	Date Collected:	02/19/15 13:15
Client ID:	CDM-4 5'-8'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/21/15 12:20
Analytical Date:	02/25/15 10:22	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/23/15
Percent Solids:	71%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	458	--	50
C19-C36 Aliphatics	ND		mg/kg	458	--	50
C11-C22 Aromatics	4110		mg/kg	458	--	50
C11-C22 Aromatics, Adjusted	2690		mg/kg	458	--	50

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	0	Q	40-140
o-Terphenyl	0	Q	40-140
2-Fluorobiphenyl	104		40-140
2-Bromonaphthalene	95		40-140

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method:	98,EPH-04-1.1	Extraction Method:	EPA 3546
Analytical Date:	02/23/15 22:40	Extraction Date:	02/21/15 12:20
Analyst:	SR	Cleanup Method:	EPH-04-1
		Cleanup Date:	02/22/15

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG764053-1					
C9-C18 Aliphatics	ND		mg/kg	6.59	--
C19-C36 Aliphatics	ND		mg/kg	6.59	--
C11-C22 Aromatics	ND		mg/kg	6.59	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.59	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	40		40-140
o-Terphenyl	80		40-140
2-Fluorobiphenyl	96		40-140
2-Bromonaphthalene	87		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG764053-2 WG764053-3								
C9-C18 Aliphatics	78		71		40-140	9		25
C19-C36 Aliphatics	88		81		40-140	8		25
C11-C22 Aromatics	86		76		40-140	12		25
Naphthalene	70		58		40-140	19		25
2-Methylnaphthalene	79		66		40-140	18		25
Acenaphthylene	73		62		40-140	16		25
Acenaphthene	77		66		40-140	15		25
Fluorene	84		73		40-140	14		25
Phenanthrene	85		75		40-140	13		25
Anthracene	90		81		40-140	11		25
Fluoranthene	88		78		40-140	12		25
Pyrene	88		79		40-140	11		25
Benzo(a)anthracene	83		74		40-140	11		25
Chrysene	89		80		40-140	11		25
Benzo(b)fluoranthene	89		79		40-140	12		25
Benzo(k)fluoranthene	84		75		40-140	11		25
Benzo(a)pyrene	82		74		40-140	10		25
Indeno(1,2,3-cd)Pyrene	68		60		40-140	13		25
Dibenzo(a,h)anthracene	82		73		40-140	12		25
Benzo(ghi)perylene	84		74		40-140	13		25
Nonane (C9)	50		47		30-140	6		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503157
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG764053-2 WG764053-3								
Decane (C10)	60		55		40-140	9		25
Dodecane (C12)	69		64		40-140	8		25
Tetradecane (C14)	74		68		40-140	8		25
Hexadecane (C16)	77		71		40-140	8		25
Octadecane (C18)	80		74		40-140	8		25
Nonadecane (C19)	82		76		40-140	8		25
Eicosane (C20)	82		76		40-140	8		25
Docosane (C22)	83		76		40-140	9		25
Tetracosane (C24)	83		77		40-140	8		25
Hexacosane (C26)	84		78		40-140	7		25
Octacosane (C28)	82		76		40-140	8		25
Triacontane (C30)	86		80		40-140	7		25
Hexatriacontane (C36)	80		74		40-140	8		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	56		50		40-140
o-Terphenyl	71		62		40-140
2-Fluorobiphenyl	82		75		40-140
2-Bromonaphthalene	76		70		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

PCBS

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-01	Date Collected:	02/19/15 13:00
Client ID:	CDM-4 1'-5'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/21/15 00:59
Analytical Date:	02/22/15 19:43	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	02/22/15
Percent Solids:	88%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/22/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.0	--	1	A
Aroclor 1221	ND		ug/kg	36.0	--	1	A
Aroclor 1232	ND		ug/kg	36.0	--	1	A
Aroclor 1242	ND		ug/kg	36.0	--	1	A
Aroclor 1248	ND		ug/kg	36.0	--	1	A
Aroclor 1254	ND		ug/kg	36.0	--	1	A
Aroclor 1260	ND		ug/kg	36.0	--	1	A
Aroclor 1262	ND		ug/kg	36.0	--	1	A
Aroclor 1268	ND		ug/kg	36.0	--	1	A
PCBs, Total	ND		ug/kg	36.0	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	53		30-150	A
Decachlorobiphenyl	31		30-150	A
2,4,5,6-Tetrachloro-m-xylene	48		30-150	B
Decachlorobiphenyl	36		30-150	B

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-02	Date Collected:	02/19/15 13:15
Client ID:	CDM-4 5'-8'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/24/15 13:57
Analytical Date:	02/25/15 05:50	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	02/24/15
Percent Solids:	71%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/24/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	46.0	--	1	A
Aroclor 1221	ND		ug/kg	46.0	--	1	A
Aroclor 1232	ND		ug/kg	46.0	--	1	A
Aroclor 1242	ND		ug/kg	46.0	--	1	A
Aroclor 1248	ND		ug/kg	46.0	--	1	A
Aroclor 1254	ND		ug/kg	46.0	--	1	A
Aroclor 1260	ND		ug/kg	46.0	--	1	A
Aroclor 1262	ND		ug/kg	46.0	--	1	A
Aroclor 1268	ND		ug/kg	46.0	--	1	A
PCBs, Total	ND		ug/kg	46.0	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	33		30-150	A
Decachlorobiphenyl	32		30-150	A
2,4,5,6-Tetrachloro-m-xylene	30		30-150	B
Decachlorobiphenyl	47		30-150	B

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 02/22/15 20:33
Analyst: JW

Extraction Method: EPA 3546
Extraction Date: 02/21/15 00:59
Cleanup Method: EPA 3665A
Cleanup Date: 02/22/15
Cleanup Method: EPA 3660B
Cleanup Date: 02/22/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01 Batch: WG764007-1						
Aroclor 1016	ND		ug/kg	32.0	--	A
Aroclor 1221	ND		ug/kg	32.0	--	A
Aroclor 1232	ND		ug/kg	32.0	--	A
Aroclor 1242	ND		ug/kg	32.0	--	A
Aroclor 1248	ND		ug/kg	32.0	--	A
Aroclor 1254	ND		ug/kg	32.0	--	A
Aroclor 1260	ND		ug/kg	32.0	--	A
Aroclor 1262	ND		ug/kg	32.0	--	A
Aroclor 1268	ND		ug/kg	32.0	--	A
PCBs, Total	ND		ug/kg	32.0	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	56		30-150	A
Decachlorobiphenyl	37		30-150	A
2,4,5,6-Tetrachloro-m-xylene	52		30-150	B
Decachlorobiphenyl	46		30-150	B

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503157
Report Date: 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 02/24/15 15:51
Analyst: JW

Extraction Method: EPA 3546
Extraction Date: 02/24/15 13:57
Cleanup Method: EPA 3665A
Cleanup Date: 02/24/15
Cleanup Method: EPA 3660B
Cleanup Date: 02/24/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 02 Batch: WG764521-1						
Aroclor 1016	ND		ug/kg	32.6	--	A
Aroclor 1221	ND		ug/kg	32.6	--	A
Aroclor 1232	ND		ug/kg	32.6	--	A
Aroclor 1242	ND		ug/kg	32.6	--	A
Aroclor 1248	ND		ug/kg	32.6	--	A
Aroclor 1254	ND		ug/kg	32.6	--	A
Aroclor 1260	ND		ug/kg	32.6	--	A
Aroclor 1262	ND		ug/kg	32.6	--	A
Aroclor 1268	ND		ug/kg	32.6	--	A
PCBs, Total	ND		ug/kg	32.6	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		30-150	A
Decachlorobiphenyl	42		30-150	A
2,4,5,6-Tetrachloro-m-xylene	69		30-150	B
Decachlorobiphenyl	54		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157

Project Number: 0139-107911 **Report Date:** 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01 Batch: WG764007-2 WG764007-3									
Aroclor 1016	101		80		40-140	23		30	A
Aroclor 1260	60		52		40-140	14		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	62		54		30-150	A
Decachlorobiphenyl	40		36		30-150	A
2,4,5,6-Tetrachloro-m-xylene	56		53		30-150	B
Decachlorobiphenyl	50		47		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157
Project Number: 0139-107911 **Report Date:** 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 02 Batch: WG764521-2 WG764521-3									
Aroclor 1016	82		81		40-140	1		30	A
Aroclor 1260	52		51		40-140	2		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	0	Q	0	Q	30-150	A
Decachlorobiphenyl	0	Q	0	Q	30-150	A
2,4,5,6-Tetrachloro-m-xylene	0	Q	0	Q	30-150	B
Decachlorobiphenyl	0	Q	0	Q	30-150	B

METALS

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503157
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503157-01	Date Collected:	02/19/15 13:00
Client ID:	CDM-4 1'-5'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	88%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	3.4		mg/kg	0.43	--	1	02/20/15 15:04	02/23/15 13:24	EPA 3050B	97,6010C	JH
Barium, Total	36		mg/kg	0.43	--	1	02/20/15 15:04	02/23/15 13:24	EPA 3050B	97,6010C	JH
Cadmium, Total	ND		mg/kg	0.43	--	1	02/20/15 15:04	02/23/15 13:24	EPA 3050B	97,6010C	JH
Chromium, Total	20		mg/kg	0.43	--	1	02/20/15 15:04	02/23/15 13:24	EPA 3050B	97,6010C	JH
Lead, Total	79		mg/kg	2.1	--	1	02/20/15 15:04	02/23/15 13:24	EPA 3050B	97,6010C	JH
Mercury, Total	0.084		mg/kg	0.008	--	1	02/20/15 05:01	02/20/15 12:01	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.1	--	1	02/20/15 15:04	02/23/15 13:24	EPA 3050B	97,6010C	JH
Silver, Total	ND		mg/kg	0.43	--	1	02/20/15 15:04	02/23/15 13:24	EPA 3050B	97,6010C	JH

Project Name: KING OPEN SCHOOL | **Lab Number:** L1503157

Project Number: 0139-107911 | **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID: L1503157-02
Client ID: CDM-4 5'-8'
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Percent Solids: 71%

Date Collected: 02/19/15 13:15
Date Received: 02/19/15
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	10		mg/kg	0.55	--	1	02/20/15 15:04	02/23/15 13:28	EPA 3050B	97,6010C	JH
Barium, Total	120		mg/kg	0.55	--	1	02/20/15 15:04	02/23/15 13:28	EPA 3050B	97,6010C	JH
Cadmium, Total	ND		mg/kg	0.55	--	1	02/20/15 15:04	02/23/15 13:28	EPA 3050B	97,6010C	JH
Chromium, Total	32		mg/kg	0.55	--	1	02/20/15 15:04	02/23/15 13:28	EPA 3050B	97,6010C	JH
Lead, Total	450		mg/kg	2.7	--	1	02/20/15 15:04	02/23/15 13:28	EPA 3050B	97,6010C	JH
Mercury, Total	2.90		mg/kg	0.094	--	1	02/20/15 05:01	02/20/15 12:03	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.7	--	1	02/20/15 15:04	02/23/15 13:28	EPA 3050B	97,6010C	JH
Silver, Total	0.64		mg/kg	0.55	--	1	02/20/15 15:04	02/23/15 13:28	EPA 3050B	97,6010C	JH

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157
Project Number: 0139-107911 **Report Date:** 02/25/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG763763-1										
Mercury, Total	ND		mg/kg	0.083	--	1	02/20/15 05:01	02/20/15 11:39	97,7471B	MC

Prep Information

Digestion Method: EPA 7471B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG763920-1										
Arsenic, Total	ND		mg/kg	0.40	--	1	02/20/15 15:04	02/23/15 13:01	97,6010C	JH
Barium, Total	ND		mg/kg	0.40	--	1	02/20/15 15:04	02/23/15 13:01	97,6010C	JH
Cadmium, Total	ND		mg/kg	0.40	--	1	02/20/15 15:04	02/23/15 13:01	97,6010C	JH
Chromium, Total	ND		mg/kg	0.40	--	1	02/20/15 15:04	02/23/15 13:01	97,6010C	JH
Lead, Total	ND		mg/kg	2.0	--	1	02/20/15 15:04	02/23/15 13:01	97,6010C	JH
Selenium, Total	ND		mg/kg	2.0	--	1	02/20/15 15:04	02/23/15 13:01	97,6010C	JH
Silver, Total	ND		mg/kg	0.40	--	1	02/20/15 15:04	02/24/15 20:49	97,6010C	BC

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1503157
Project Number: 0139-107911
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG763763-2 WG763763-3 SRM Lot Number: D083-540								
Mercury, Total	114		114		75-126	0		30
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG763920-2 WG763920-3 SRM Lot Number: D083-540								
Arsenic, Total	106		106		78-122	0		30
Barium, Total	108		102		82-117	6		30
Cadmium, Total	99		98		82-118	1		30
Chromium, Total	108		98		79-121	10		30
Lead, Total	93		90		81-119	3		30
Selenium, Total	115		109		78-123	5		30
Silver, Total	111		105		74-125	6		30

INORGANICS
&
MISCELLANEOUS

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

SAMPLE RESULTS

Lab ID: L1503157-01
Client ID: CDM-4 1'-5'
Sample Location: CAMBRIDGE, MA
Matrix: Soil

Date Collected: 02/19/15 13:00
Date Received: 02/19/15
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	87.6		%	0.100	NA	1	-	02/19/15 23:00	30,2540G	RT

Project Name: KING OPEN SCHOOL

Project Number: 0139-107911

Lab Number: L1503157

Report Date: 02/25/15

SAMPLE RESULTS

Lab ID: L1503157-02
Client ID: CDM-4 5'-8'
Sample Location: CAMBRIDGE, MA
Matrix: Soil

Date Collected: 02/19/15 13:15
Date Received: 02/19/15
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	70.5		%	0.100	NA	1	-	02/19/15 23:00	30,2540G	RT

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Lab Duplicate Analysis

Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG763738-1 QC Sample: L1503106-05 Client ID: DUP Sample						
Solids, Total	89.5	88.5	%	1		20

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: 02/19/2015 21:16

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503157-01A	Vial MeOH preserved	A	N/A	3.7	Y	Absent	MCP-8260HLW-10(14)
L1503157-01B	Vial water preserved	A	N/A	3.7	Y	Absent	MCP-8260HLW-10(14)
L1503157-01C	Vial water preserved	A	N/A	3.7	Y	Absent	MCP-8260HLW-10(14)
L1503157-01D	Glass 120ml/4oz unpreserved	A	N/A	3.7	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1503157-01E	Glass 250ml/8oz unpreserved	A	N/A	3.7	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1503157-02A	Vial MeOH preserved	A	N/A	3.7	Y	Absent	MCP-8260HLW-10(14)
L1503157-02B	Vial water preserved	A	N/A	3.7	Y	Absent	MCP-8260HLW-10(14)
L1503157-02C	Vial water preserved	A	N/A	3.7	Y	Absent	MCP-8260HLW-10(14)
L1503157-02D	Glass 120ml/4oz unpreserved	A	N/A	3.7	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)

400

*Values in parentheses indicate holding time in days

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503157
Report Date: 02/25/15

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503157-02E	Glass 250ml/8oz unpreserved	A	N/A	3.7	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL - Estimated 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 EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

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

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

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 ten times (10x) 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. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

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.

Project Name: KING OPEN SCHOOL **Lab Number:** L1503157
Project Number: 0139-107911 **Report Date:** 02/25/15

Data Qualifiers

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 lower value for the two columns 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.

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.

S - Analytical results are from modified screening analysis.

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

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

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.

98 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, 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.

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: 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
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

Serial_No:02251518:22

CHAIN OF CHSTODY

PAGE ____ OF ____

ALPHA ANALYTICAL

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: 2/19/15

ALPHA Job #: L1503157

Project Information

Project Name: King Open School
Project Location: Cambridge, MA
Project #: 0139-107911
Project Manager: Tony McMillan
ALPHA Quote #:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

Client Information

Client: CDM Smith
Address: 50 Hampshire St
Cambridge, MA 02139
Phone: 617 452 6419
Email: wocee@cdmsmith.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 ______ Criteria ______

Turn-Around Time

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

Date Due: 2/26/15

Additional Project Information:

Run TCLP if 20x Rule Exceeded

ANALYSIS: VOC: ☒ 8260 ☐ 624 ☐ 524.2; SVOC: ☒ ABN ☐ PAH; METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15 ☐ PP13; METALS: ☐ RCRA5 ☒ RCRA8; EPH: ☐ Ranges & Targets ☒ Ranges Only; VPH: ☐ Ranges & Targets ☐ Ranges Only; ☐ PEST ☒ PCB; 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	VOC 8260	SVOC ABN	METALS MCP	METALS RCRA8	EPH Ranges Only	VPH	PCB	Sample Comments	TOTAL # BOTTLES
03157-01	CDM-4 1'-5'	2/19	13:00	S	EW	X	X		X	X		X		5
-02	CDM-4 5-8	2/19	13:15	S	EW	X	X		X	X		X		5
Container Type						V	V		A	A		A		
Preservative						A	F		A	A		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
Elizabeth Wr	2/19/15	T. Huffle	2/19/15 1340
T. Huffle	2/19/15 1815	[illegible]	2/19/15 18:15

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.
FORM NO: 01-01 (rev. 12-Mar-2012)

7A
Volatile Organics CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503157

Instrument ID: Voa104.i   Calibration Date: 23-FEB-2015 Time: 08:32

Lab File ID: 0223A01   Init. Calib. Date(s): 14-NOV-2   14-NOV-2

Sample No: 8260 CCAL   Init. Calib. Times : 18:34   21:39

Compound	$\overline{RRF}$	RRF	MIN RRF	%D	MAX %D	
dichlorodifluoromethane	.16305	.11789	.1	-28	20	F
chloromethane	.31614	.28462	.1	-10	20	
vinyl chloride	.2743	.24258	.1	-12	20	
bromomethane	100	92.820	.1	-7	20	
chloroethane	.13774	.14156	.1	3	20	
trichlorofluoromethane	.27387	.24307	.1	-11	20	
ethyl ether	.09232	.0943	.05	2	20	
1,1,-dichloroethene	.2177	.172	.1	-21	20	F
carbon disulfide	.70085	.55825	.1	-20	20	F
methylene chloride	.26137	.25128	.1	-4	20	
acetone	100	111	.1	11	20	
trans-1,2-dichloroethene	.25442	.24165	.1	-5	20	
methyl tert butyl ether	.55986	.52728	.1	-6	20	
Diisopropyl Ether	.94156	.95208	.05	1	20	
1,1-dichloroethane	.49595	.47979	.2	-3	20	
Ethyl-Tert-Butyl-Ether	.82014	.79499	.05	-3	20	
cis-1,2-dichloroethene	.28074	.27544	.1	-2	20	
2,2-dichloropropane	.35677	.34504	.05	-3	20	
bromochloromethane	.12861	.12218	.05	-5	20	
chloroform	.44837	.44272	.2	-1	20	
carbontetrachloride	.32832	.30078	.1	-8	20	
tetrahydrofuran	.06814	.06666	.05	-2	20	
1,1,1-trichloroethane	.37681	.35793	.1	-5	20	
2-butanone	.09192	.09652	.1	5	20	F
1,1-dichloropropene	.33481	.31834	.05	-5	20	
benzene	.97656	.94978	.5	-3	20	
Tertiary-Amyl Methyl Ether	.62875	.60029	.05	-5	20	
1,2-dichloroethane	.30244	.28541	.1	-6	20	
trichloroethene	.264	.26276	.2	0	20	
dibromomethane	.14205	.13355	.05	-6	20	
1,2-dichloropropane	.27957	.28008	.1	0	20	
bromodichloromethane	.33098	.33273	.2	1	20	
1,4-dioxane	.00202	.00187	.05	-7	20	F
cis-1,3-dichloropropene	.39239	.39164	.2	0	20	
toluene	.87644	.87542	.4	0	20	
tetrachloroethene	.36363	.36775	.2	1	20	
4-methyl-2-pentanone	.07517	.0747	.1	-1	20	F
trans-1,3-dichloropropene	.46349	.46291	.1	0	20	

FORM VII MCP-8260HLW-10

7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503157

Instrument ID: Voa104.i   Calibration Date: 23-FEB-2015 Time: 08:32

Lab File ID: 0223A01   Init. Calib. Date(s): 14-NOV-2   14-NOV-2

Sample No: 8260 CCAL   Init. Calib. Times : 18:34   21:39

Compound	RRF (mean)	RRF	MIN RRF	%D	MAX %D
1,1,2-trichloroethane	.23224	.22975	.1	-1	20
chlorodibromomethane	.34856	.33912	.1	-3	20
1,3-dichloropropane	.45928	.45616	.05	-1	20
1,2-dibromoethane	.28223	.26925	.1	-5	20
2-hexanone	.19278	.19613	.1	2	20
chlorobenzene	1.0010	1.0173	.5	2	20
ethyl benzene	1.6393	1.7212	.1	5	20
1,1,1,2-tetrachloroethane	.3581	.36515	.05	2	20
p/m xylene	.63448	.67727	.1	7	20
o xylene	.6125	.64323	.3	5	20
styrene	1.0136	1.0645	.3	5	20
bromoform	.39846	.38486	.1	-3	20
isopropylbenzene	3.1932	3.3213	.1	4	20
bromobenzene	.84329	.84606	.05	0	20
n-propylbenzene	3.6352	3.8898	.05	7	20
1,1,2,2,-tetrachloroethane	.67812	.66895	.3	-1	20
2-chlorotoluene	2.3296	2.4033	.05	3	20
1,2,3-trichloropropane	.49557	.47946	.05	-3	20
1,3,5-trimethybenzene	2.6303	2.8215	.05	7	20
4-chorotoluene	2.2427	2.3978	.05	7	20
tert-butylbenzene	2.2838	2.3541	.05	3	20
1,2,4-trimethylbenzene	2.6527	2.8335	.05	7	20
sec-butylbenzene	3.4242	3.5641	.05	4	20
p-isopropyltoluene	2.8275	3.0351	.05	7	20
1,3-dichlorobenzene	1.5651	1.6607	.6	6	20
1,4-dichlorobenzene	1.6000	1.6701	.5	4	20
n-butylbenzene	2.4383	2.7552	.05	13	20
1,2-dichlorobenzene	1.4443	1.4819	.4	3	20
1,2-dibromo-3-chloropropane	.10573	.09711	.05	-8	20
hexachlorobutadiene	.45607	.47615	.05	4	20
1,2,4-trichlorobenzene	.95262	1.0266	.2	8	20
naphthalene	2.1836	2.0208	.05	-7	20
1,2,3-trichlorobenzene	.88772	.89581	.05	1	20
dibromofluoromethane	.2538	.25513	.05	1	30
1,2-dichloroethane-d4	.22706	.22053	.05	-3	30
toluene-d8	1.3076	1.3296	.05	2	30
4-bromofluorobenzene	.90729	.94055	.05	4	30

FORM VII MCP-8260HLW-10

408

ANALYTICAL REPORT

Lab Number:	L1503567
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Jay McMullen
Phone:	(617) 452-6303
Project Name:	KING OPEN SCHOOL
Project Number:	0139-107911
Report Date:	03/03/15

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

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

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503567
Project Number:	0139-107911	**Report Date:**	03/03/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1503567-01	CDM-4 5'-8'	SOIL	CAMBRIDGE, MA	02/19/15 13:15	02/19/15

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.

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. All specific QC 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. 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 (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar 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. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: KING OPEN SCHOOL **Lab Number:** L1503567
Project Number: 0139-107911 **Report Date:** 03/03/15

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: 03/03/15

METALS

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503567
Project Number:	0139-107911	**Report Date:**	03/03/15

SAMPLE RESULTS

Lab ID:	L1503567-01	Date Collected:	02/19/15 13:15
Client ID:	CDM-4 5'-8'	Date Received:	02/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	TCLP/SPLP Ext. Date:	02/26/15 23:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Lead, TCLP	0.68		mg/l	0.50	--	1	03/03/15 04:47	03/03/15 10:57	EPA 3015	1,6010C	JH

Project Name: KING OPEN SCHOOL
Lab Number: L1503567
Project Number: 0139-107911
Report Date: 03/03/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab for sample(s): 01 Batch: WG765363-1										
Lead, TCLP	ND		mg/l	0.50	--	1	03/03/15 04:47	03/03/15 10:09	1,6010C	JH

Prep Information

Digestion Method: EPA 3015
TCLP/SPLP Extraction Date: 02/26/15 23:59

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1503567
Project Number: 0139-107911
Report Date: 03/03/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 Batch: WG765363-2								
Lead, TCLP	90		-		75-125	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503567
Report Date: 03/03/15

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG765363-4 QC Sample: L1503654-01 Client ID: MS Sample												
Lead, TCLP	ND	5.1	4.5	88		-	-		75-125	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503567
Report Date: 03/03/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG765363-3 QC Sample: L1503654-01 Client ID: DUP Sample						
Lead, TCLP	ND	ND	mg/l	NC		20

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503567
Report Date: 03/03/15

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(*)
L1503567-01A	Amber 250ml unpreserved	A	N/A	3.7	Y	Absent	-
L1503567-01X	Plastic 120ml HNO3 preserved spl	A	<2	3.7	Y	Absent	PB-CI(180)
L1503567-01X9	Tumble Vessel	A	N/A	3.7	Y	Absent	-

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL - Estimated 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 EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

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

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

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 ten times (10x) 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. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

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.

Project Name: KING OPEN SCHOOL **Lab Number:** L1503567
Project Number: 0139-107911 **Report Date:** 03/03/15

Data Qualifiers

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 lower value for the two columns 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.

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.

S - Analytical results are from modified screening analysis.

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

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

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

LIMITATION OF LIABILITIES

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: 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
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

Serial_No:03031516:08
L1503567 ER 2/26/15

CHAIN OF CUSTODY

PAGE ____ OF ____

ALPHA ANALYTICAL
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: 2/19/15

ALPHA Job #: ~~L1503157~~

Project Information

Project Name: King Open School

Project Location: Cambridge, MA

Project #: 0139-107911

Project Manager: Jay McMillan

ALPHA Quote #:

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

Client Information

Client: CDM Smith

Address: 50 Hampshire St, Cambridge, MA 02139

Phone: 617 452 6419

Email: woee@cdmsmith.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 ____ Criteria ____

Turn-Around Time

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

3/5/15

Date Due: ~~2/26/15~~

Additional Project Information:

Run TCLP if 20x Rule Exceeded

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; TPH: ☐ Quant Only ☐ Fingerprint; ☒ PCB ☐ PEST; TCLP-Pb

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	VOC	SVOC	METALS (MCP)	METALS (RCRA)	EPH	VPH	PCB	TPH	TCLP-Pb	Sample Comments	TOTAL # BOTTLES
~~03157-01~~ 03567-01	CDM-4 1'-5'	2/19	13:00	S	EW	X	X		X	X		X				5
~~-02~~	CDM-4 5-8'	2/19	13:15	S	EW	X	X		X	X		X		X		5

	VOC	SVOC	METALS (MCP)	METALS (RCRA)	EPH	VPH	PCB
Container Type	V	V		A	A		A
Preservative	A	F		A	A		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
Elizabeth Wi...	2/19/15	T. Hu...	2/19/15 1340
T. Hu...	2/19/15 1815	...	2/19/15 1815

FORM NO: 01-01 (rev. 12-Mar-2012)

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ANALYTICAL REPORT

Lab Number:	L1502986
Client:	CDM Smith, Inc. 1 Cambridge Place 50 Hampshire Street Cambridge, MA 02139
ATTN:	Jay McMullen
Phone:	(617) 452-6303
Project Name:	KING OPEN SCHOOL
Project Number:	0139-107911
Report Date:	02/24/15

Certifications & Approvals: NY (11627), CT (PH-0141), NH (2206), NJ NELAP (MA015), RI (LAO00299), ME (MA00030), PA (68-02089), VA (460194), LA NELAP (03090), FL (E87814), TX (T104704419), WA (C954), USFWS (Permit #LE2069641), USDA (Permit #P330-11-00109), 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: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1502986-01	CDM-5 1'-5'	SOIL	CAMBRIDGE, MA	02/17/15 09:30	02/17/15
L1502986-02	CDM-5 5'-9'	SOIL	CAMBRIDGE, MA	02/17/15 09:45	02/17/15

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1502986
Project Number:	0139-107911	**Report Date:**	02/24/15

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).	YES
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)?	NO

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.

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. All specific QC 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. 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 (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar 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. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Metals.

Volatile Organics

In reference to question H:

The initial calibration, associated with L1502986-01 and -02, did not meet the method required minimum response factor on the lowest calibration standard for acetone (0.09113), 4-methyl-2-pentanone (0.09052), and 1,4-dioxane (0.00277), as well as the average response factor for acetone, 4-methyl-2-pentanone, and 1,4-dioxane. The initial calibration verification, associated with L1502986-01 and -02, is outside acceptance criteria for dichlorodifluoromethane (163%) and ethyl ether (159%); however, the associated samples are non-detect for these compounds.

The continuing calibration standard, associated with L1502986-01 and -02, is outside the acceptance criteria for several compounds; however, it is within overall method allowances. A copy of the continuing calibration standard is included as an addendum to this report.

EPH

In reference to question I:

All samples were analyzed for a subset of MCP compounds per the Chain of Custody.

Metals

In reference to question I:

All samples were analyzed for a subset of MCP elements per the Chain of Custody.

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: 02/24/15

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ORGANICS

VOLATILES

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID: L1502986-01
Client ID: CDM-5 1'-5'
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 02/19/15 18:46
Analyst: MV
Percent Solids: 85%

Date Collected: 02/17/15 09:30
Date Received: 02/17/15
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	9.4	--	1
1,1-Dichloroethane	ND		ug/kg	1.4	--	1
Chloroform	ND		ug/kg	1.4	--	1
Carbon tetrachloride	ND		ug/kg	0.94	--	1
1,2-Dichloropropane	ND		ug/kg	3.3	--	1
Dibromochloromethane	ND		ug/kg	0.94	--	1
1,1,2-Trichloroethane	ND		ug/kg	1.4	--	1
Tetrachloroethene	ND		ug/kg	0.94	--	1
Chlorobenzene	ND		ug/kg	0.94	--	1
Trichlorofluoromethane	ND		ug/kg	3.7	--	1
1,2-Dichloroethane	ND		ug/kg	0.94	--	1
1,1,1-Trichloroethane	ND		ug/kg	0.94	--	1
Bromodichloromethane	ND		ug/kg	0.94	--	1
trans-1,3-Dichloropropene	ND		ug/kg	0.94	--	1
cis-1,3-Dichloropropene	ND		ug/kg	0.94	--	1
1,3-Dichloropropene, Total	ND		ug/kg	0.94	--	1
1,1-Dichloropropene	ND		ug/kg	3.7	--	1
Bromoform	ND		ug/kg	3.7	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.94	--	1
Benzene	ND		ug/kg	0.94	--	1
Toluene	ND		ug/kg	1.4	--	1
Ethylbenzene	ND		ug/kg	0.94	--	1
Chloromethane	ND		ug/kg	3.7	--	1
Bromomethane	ND		ug/kg	1.9	--	1
Vinyl chloride	ND		ug/kg	1.9	--	1
Chloroethane	ND		ug/kg	1.9	--	1
1,1-Dichloroethene	ND		ug/kg	0.94	--	1
trans-1,2-Dichloroethene	ND		ug/kg	1.4	--	1
Trichloroethene	ND		ug/kg	0.94	--	1
1,2-Dichlorobenzene	ND		ug/kg	3.7	--	1

Project Name: KING OPEN SCHOOL | **Lab Number:** L1502986

Project Number: 0139-107911 | **Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID: L1502986-01 | Date Collected: 02/17/15 09:30

Client ID: CDM-5 1'-5' | Date Received: 02/17/15

Sample Location: CAMBRIDGE, MA | Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	3.7	--	1
1,4-Dichlorobenzene	ND		ug/kg	3.7	--	1
Methyl tert butyl ether	ND		ug/kg	1.9	--	1
p/m-Xylene	ND		ug/kg	1.9	--	1
o-Xylene	ND		ug/kg	1.9	--	1
Xylenes, Total	ND		ug/kg	1.9	--	1
cis-1,2-Dichloroethene	ND		ug/kg	0.94	--	1
1,2-Dichloroethene, Total	ND		ug/kg	0.94	--	1
Dibromomethane	ND		ug/kg	3.7	--	1
1,2,3-Trichloropropane	ND		ug/kg	3.7	--	1
Styrene	ND		ug/kg	1.9	--	1
Dichlorodifluoromethane	ND		ug/kg	9.4	--	1
Acetone	ND		ug/kg	34	--	1
Carbon disulfide	ND		ug/kg	3.7	--	1
Methyl ethyl ketone	ND		ug/kg	9.4	--	1
Methyl isobutyl ketone	ND		ug/kg	9.4	--	1
2-Hexanone	ND		ug/kg	9.4	--	1
Bromochloromethane	ND		ug/kg	3.7	--	1
Tetrahydrofuran	ND		ug/kg	3.7	--	1
2,2-Dichloropropane	ND		ug/kg	4.7	--	1
1,2-Dibromoethane	ND		ug/kg	3.7	--	1
1,3-Dichloropropane	ND		ug/kg	3.7	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.94	--	1
Bromobenzene	ND		ug/kg	4.7	--	1
n-Butylbenzene	ND		ug/kg	0.94	--	1
sec-Butylbenzene	ND		ug/kg	0.94	--	1
tert-Butylbenzene	ND		ug/kg	3.7	--	1
o-Chlorotoluene	ND		ug/kg	3.7	--	1
p-Chlorotoluene	ND		ug/kg	3.7	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	3.7	--	1
Hexachlorobutadiene	ND		ug/kg	3.7	--	1
Isopropylbenzene	ND		ug/kg	0.94	--	1
p-Isopropyltoluene	ND		ug/kg	0.94	--	1
Naphthalene	ND		ug/kg	3.7	--	1
n-Propylbenzene	ND		ug/kg	0.94	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	3.7	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	3.7	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	3.7	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	3.7	--	1

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Project Name: KING OPEN SCHOOL **Lab Number:** L1502986

Project Number: 0139-107911 **Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID:	L1502986-01	Date Collected:	02/17/15 09:30
Client ID:	CDM-5 1'-5'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	4.7	--	1
Diisopropyl Ether	ND		ug/kg	3.7	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	3.7	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	3.7	--	1
1,4-Dioxane	ND		ug/kg	37	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	115		70-130
Toluene-d8	114		70-130
4-Bromofluorobenzene	109		70-130
Dibromofluoromethane	103		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986

Project Number: 0139-107911 **Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID:	L1502986-02	Date Collected:	02/17/15 09:45
Client ID:	CDM-5 5'-9'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Analytical Method:	97,8260C		
Analytical Date:	02/19/15 19:13		
Analyst:	MV		
Percent Solids:	71%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	19	--	1
1,1-Dichloroethane	ND		ug/kg	2.8	--	1
Chloroform	ND		ug/kg	2.8	--	1
Carbon tetrachloride	ND		ug/kg	1.9	--	1
1,2-Dichloropropane	ND		ug/kg	6.6	--	1
Dibromochloromethane	ND		ug/kg	1.9	--	1
1,1,2-Trichloroethane	ND		ug/kg	2.8	--	1
Tetrachloroethene	ND		ug/kg	1.9	--	1
Chlorobenzene	ND		ug/kg	1.9	--	1
Trichlorofluoromethane	ND		ug/kg	7.6	--	1
1,2-Dichloroethane	ND		ug/kg	1.9	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.9	--	1
Bromodichloromethane	ND		ug/kg	1.9	--	1
trans-1,3-Dichloropropene	ND		ug/kg	1.9	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.9	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.9	--	1
1,1-Dichloropropene	ND		ug/kg	7.6	--	1
Bromoform	ND		ug/kg	7.6	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.9	--	1
Benzene	ND		ug/kg	1.9	--	1
Toluene	ND		ug/kg	2.8	--	1
Ethylbenzene	ND		ug/kg	1.9	--	1
Chloromethane	ND		ug/kg	7.6	--	1
Bromomethane	ND		ug/kg	3.8	--	1
Vinyl chloride	ND		ug/kg	3.8	--	1
Chloroethane	ND		ug/kg	3.8	--	1
1,1-Dichloroethene	ND		ug/kg	1.9	--	1
trans-1,2-Dichloroethene	ND		ug/kg	2.8	--	1
Trichloroethene	ND		ug/kg	1.9	--	1
1,2-Dichlorobenzene	ND		ug/kg	7.6	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986

Project Number: 0139-107911 **Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID:	L1502986-02	Date Collected:	02/17/15 09:45
Client ID:	CDM-5 5'-9'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	7.6	--	1
1,4-Dichlorobenzene	ND		ug/kg	7.6	--	1
Methyl tert butyl ether	ND		ug/kg	3.8	--	1
p/m-Xylene	ND		ug/kg	3.8	--	1
o-Xylene	ND		ug/kg	3.8	--	1
Xylenes, Total	ND		ug/kg	3.8	--	1
cis-1,2-Dichloroethene	ND		ug/kg	1.9	--	1
1,2-Dichloroethene, Total	ND		ug/kg	1.9	--	1
Dibromomethane	ND		ug/kg	7.6	--	1
1,2,3-Trichloropropane	ND		ug/kg	7.6	--	1
Styrene	ND		ug/kg	3.8	--	1
Dichlorodifluoromethane	ND		ug/kg	19	--	1
Acetone	ND		ug/kg	68	--	1
Carbon disulfide	ND		ug/kg	7.6	--	1
Methyl ethyl ketone	ND		ug/kg	19	--	1
Methyl isobutyl ketone	ND		ug/kg	19	--	1
2-Hexanone	ND		ug/kg	19	--	1
Bromochloromethane	ND		ug/kg	7.6	--	1
Tetrahydrofuran	ND		ug/kg	7.6	--	1
2,2-Dichloropropane	ND		ug/kg	9.5	--	1
1,2-Dibromoethane	ND		ug/kg	7.6	--	1
1,3-Dichloropropane	ND		ug/kg	7.6	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.9	--	1
Bromobenzene	ND		ug/kg	9.5	--	1
n-Butylbenzene	ND		ug/kg	1.9	--	1
sec-Butylbenzene	ND		ug/kg	1.9	--	1
tert-Butylbenzene	ND		ug/kg	7.6	--	1
o-Chlorotoluene	ND		ug/kg	7.6	--	1
p-Chlorotoluene	ND		ug/kg	7.6	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	7.6	--	1
Hexachlorobutadiene	ND		ug/kg	7.6	--	1
Isopropylbenzene	ND		ug/kg	1.9	--	1
p-Isopropyltoluene	ND		ug/kg	1.9	--	1
Naphthalene	ND		ug/kg	7.6	--	1
n-Propylbenzene	ND		ug/kg	1.9	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	7.6	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	7.6	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	7.6	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	7.6	--	1

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Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1502986
Project Number:	0139-107911	**Report Date:**	02/24/15

SAMPLE RESULTS

Lab ID:	L1502986-02	Date Collected:	02/17/15 09:45
Client ID:	CDM-5 5'-9'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	9.5	--	1
Diisopropyl Ether	ND		ug/kg	7.6	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	7.6	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	7.6	--	1
1,4-Dioxane	ND		ug/kg	76	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	111		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	99		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/19/15 10:50
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG763844-3					
Methylene chloride	ND		ug/kg	10	--
1,1-Dichloroethane	ND		ug/kg	1.5	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	3.5	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.5	--
Tetrachloroethene	ND		ug/kg	1.0	--
Chlorobenzene	ND		ug/kg	1.0	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	1.0	--
Bromodichloromethane	ND		ug/kg	1.0	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	1.0	--
1,3-Dichloropropene, Total	ND		ug/kg	1.0	--
1,1-Dichloropropene	ND		ug/kg	4.0	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	--
Benzene	ND		ug/kg	1.0	--
Toluene	ND		ug/kg	1.5	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	2.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	1.0	--

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1502986
Project Number:	0139-107911	**Report Date:**	02/24/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/19/15 10:50
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG763844-3					
1,2-Dichlorobenzene	ND		ug/kg	4.0	--
1,3-Dichlorobenzene	ND		ug/kg	4.0	--
1,4-Dichlorobenzene	ND		ug/kg	4.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	2.0	--
Xylenes, Total	ND		ug/kg	2.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	4.0	--
1,2,3-Trichloropropane	ND		ug/kg	4.0	--
Styrene	ND		ug/kg	2.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	36	--
Carbon disulfide	ND		ug/kg	4.0	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	4.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	5.0	--
1,2-Dibromoethane	ND		ug/kg	4.0	--
1,3-Dichloropropane	ND		ug/kg	4.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	--
Bromobenzene	ND		ug/kg	5.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	4.0	--
o-Chlorotoluene	ND		ug/kg	4.0	--

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Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/19/15 10:50
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG763844-3					
p-Chlorotoluene	ND		ug/kg	4.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	4.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	4.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	4.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	4.0	--
Diethyl ether	ND		ug/kg	5.0	--
Diisopropyl Ether	ND		ug/kg	4.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	4.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	4.0	--
1,4-Dioxane	ND		ug/kg	40	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	104		70-130
Toluene-d8	110		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	95		70-130

441

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1502986
Project Number: 0139-107911
Report Date: 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG763844-1 WG763844-2								
Methylene chloride	83		81		70-130	2		20
1,1-Dichloroethane	84		78		70-130	7		20
Chloroform	83		76		70-130	9		20
Carbon tetrachloride	78		**67**	Q	70-130	15		20
1,2-Dichloropropane	87		82		70-130	6		20
Dibromochloromethane	96		92		70-130	4		20
1,1,2-Trichloroethane	100		98		70-130	2		20
Tetrachloroethene	87		76		70-130	13		20
Chlorobenzene	93		86		70-130	8		20
Trichlorofluoromethane	78		**68**	Q	70-130	14		20
1,2-Dichloroethane	90		86		70-130	5		20
1,1,1-Trichloroethane	80		70		70-130	13		20
Bromodichloromethane	86		79		70-130	8		20
trans-1,3-Dichloropropene	100		96		70-130	4		20
cis-1,3-Dichloropropene	83		80		70-130	4		20
1,1-Dichloropropene	80		**68**	Q	70-130	16		20
Bromoform	97		96		70-130	1		20
1,1,2,2-Tetrachloroethane	103		104		70-130	1		20
Benzene	82		74		70-130	10		20
Toluene	90		81		70-130	11		20
Ethylbenzene	90		81		70-130	11		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG763844-1 WG763844-2								
Chloromethane	103		88		70-130	16		20
Bromomethane	87		80		70-130	8		20
Vinyl chloride	99		84		70-130	16		20
Chloroethane	91		84		70-130	8		20
1,1-Dichloroethene	78		**68**	Q	70-130	14		20
trans-1,2-Dichloroethene	80		72		70-130	11		20
Trichloroethene	80		71		70-130	12		20
1,2-Dichlorobenzene	96		93		70-130	3		20
1,3-Dichlorobenzene	96		91		70-130	5		20
1,4-Dichlorobenzene	96		92		70-130	4		20
Methyl tert butyl ether	84		84		70-130	0		20
p/m-Xylene	90		81		70-130	11		20
o-Xylene	89		82		70-130	8		20
cis-1,2-Dichloroethene	82		76		70-130	8		20
Dibromomethane	88		85		70-130	3		20
1,2,3-Trichloropropane	101		103		70-130	2		20
Styrene	90		85		70-130	6		20
Dichlorodifluoromethane	86		72		70-130	18		20
Acetone	96		80		70-130	18		20
Carbon disulfide	87		75		70-130	15		20
Methyl ethyl ketone	90		88		70-130	2		20

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Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG763844-1 WG763844-2								
Methyl isobutyl ketone	80		81		70-130	1		20
2-Hexanone	93		93		70-130	0		20
Bromochloromethane	88		83		70-130	6		20
Tetrahydrofuran	93		85		70-130	9		20
2,2-Dichloropropane	84		72		70-130	15		20
1,2-Dibromoethane	98		95		70-130	3		20
1,3-Dichloropropane	102		98		70-130	4		20
1,1,1,2-Tetrachloroethane	93		87		70-130	7		20
Bromobenzene	95		90		70-130	5		20
n-Butylbenzene	94		83		70-130	12		20
sec-Butylbenzene	91		80		70-130	13		20
tert-Butylbenzene	89		80		70-130	11		20
o-Chlorotoluene	78		87		70-130	11		20
p-Chlorotoluene	95		89		70-130	7		20
1,2-Dibromo-3-chloropropane	94		95		70-130	1		20
Hexachlorobutadiene	87		78		70-130	11		20
Isopropylbenzene	89		80		70-130	11		20
p-Isopropyltoluene	90		81		70-130	11		20
Naphthalene	94		95		70-130	1		20
n-Propylbenzene	78		87		70-130	11		20
1,2,3-Trichlorobenzene	96		94		70-130	2		20

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Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG763844-1 WG763844-2								
1,2,4-Trichlorobenzene	95		92		70-130	3		20
1,3,5-Trimethylbenzene	94		85		70-130	10		20
1,2,4-Trimethylbenzene	94		87		70-130	8		20
Diethyl ether	123		126		70-130	2		20
Diisopropyl Ether	88		84		70-130	5		20
Ethyl-Tert-Butyl-Ether	86		84		70-130	2		20
Tertiary-Amyl Methyl Ether	84		82		70-130	2		20
1,4-Dioxane	84		84		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	108		107		70-130
Toluene-d8	109		108		70-130
4-Bromofluorobenzene	98		99		70-130
Dibromofluoromethane	97		96		70-130

SEMIVOLATILES

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID:	L1502986-01	Date Collected:	02/17/15 09:30
Client ID:	CDM-5 1'-5'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/18/15 17:41
Analytical Date:	02/20/15 01:36		
Analyst:	JB		
Percent Solids:	85%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	--	1
Hexachlorobenzene	ND		ug/kg	120	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	--	1
2-Chloronaphthalene	ND		ug/kg	190	--	1
1,2-Dichlorobenzene	ND		ug/kg	190	--	1
1,3-Dichlorobenzene	ND		ug/kg	190	--	1
1,4-Dichlorobenzene	ND		ug/kg	190	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	--	1
2,4-Dinitrotoluene	ND		ug/kg	190	--	1
2,6-Dinitrotoluene	ND		ug/kg	190	--	1
Azobenzene	ND		ug/kg	190	--	1
Fluoranthene	390		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	--	1
Hexachlorobutadiene	ND		ug/kg	190	--	1
Hexachloroethane	ND		ug/kg	150	--	1
Isophorone	ND		ug/kg	170	--	1
Naphthalene	ND		ug/kg	190	--	1
Nitrobenzene	ND		ug/kg	170	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	190	--	1
Butyl benzyl phthalate	ND		ug/kg	190	--	1
Di-n-butylphthalate	ND		ug/kg	190	--	1
Di-n-octylphthalate	ND		ug/kg	190	--	1
Diethyl phthalate	ND		ug/kg	190	--	1
Dimethyl phthalate	ND		ug/kg	190	--	1
Benzo(a)anthracene	220		ug/kg	120	--	1
Benzo(a)pyrene	210		ug/kg	150	--	1
Benzo(b)fluoranthene	250		ug/kg	120	--	1

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1502986
Project Number:	0139-107911	**Report Date:**	02/24/15

SAMPLE RESULTS

Lab ID:	L1502986-01	Date Collected:	02/17/15 09:30
Client ID:	CDM-5 1'-5'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	ND		ug/kg	120	--	1
Chrysene	230		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	290		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	120	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	150	--	1
Pyrene	370		ug/kg	120	--	1
Aniline	ND		ug/kg	230	--	1
4-Chloroaniline	ND		ug/kg	190	--	1
Dibenzofuran	ND		ug/kg	190	--	1
2-Methylnaphthalene	ND		ug/kg	230	--	1
Acetophenone	ND		ug/kg	190	--	1
2,4,6-Trichlorophenol	ND		ug/kg	120	--	1
2-Chlorophenol	ND		ug/kg	190	--	1
2,4-Dichlorophenol	ND		ug/kg	170	--	1
2,4-Dimethylphenol	ND		ug/kg	190	--	1
2-Nitrophenol	ND		ug/kg	420	--	1
4-Nitrophenol	ND		ug/kg	270	--	1
2,4-Dinitrophenol	ND		ug/kg	930	--	1
Pentachlorophenol	ND		ug/kg	390	--	1
Phenol	ND		ug/kg	190	--	1
2-Methylphenol	ND		ug/kg	190	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	280	--	1
2,4,5-Trichlorophenol	ND		ug/kg	190	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	64		30-130
Phenol-d6	65		30-130
Nitrobenzene-d5	68		30-130
2-Fluorobiphenyl	56		30-130
2,4,6-Tribromophenol	71		30-130
4-Terphenyl-d14	38		30-130

Project Name: KING OPEN SCHOOL
Lab Number: L1502986
Project Number: 0139-107911
Report Date: 02/24/15

SAMPLE RESULTS

Lab ID: L1502986-02
Client ID: CDM-5 5'-9'
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Analytical Method: 97,8270D
Analytical Date: 02/20/15 21:31
Analyst: JB
Percent Solids: 71%

Date Collected: 02/17/15 09:45
Date Received: 02/17/15
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 02/18/15 17:41

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	180	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	230	--	1
Hexachlorobenzene	ND		ug/kg	140	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	200	--	1
2-Chloronaphthalene	ND		ug/kg	230	--	1
1,2-Dichlorobenzene	ND		ug/kg	230	--	1
1,3-Dichlorobenzene	ND		ug/kg	230	--	1
1,4-Dichlorobenzene	ND		ug/kg	230	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	230	--	1
2,4-Dinitrotoluene	ND		ug/kg	230	--	1
2,6-Dinitrotoluene	ND		ug/kg	230	--	1
Azobenzene	ND		ug/kg	230	--	1
Fluoranthene	ND		ug/kg	140	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	230	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	270	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	250	--	1
Hexachlorobutadiene	ND		ug/kg	230	--	1
Hexachloroethane	ND		ug/kg	180	--	1
Isophorone	ND		ug/kg	200	--	1
Naphthalene	ND		ug/kg	230	--	1
Nitrobenzene	ND		ug/kg	200	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	230	--	1
Butyl benzyl phthalate	ND		ug/kg	230	--	1
Di-n-butylphthalate	ND		ug/kg	230	--	1
Di-n-octylphthalate	ND		ug/kg	230	--	1
Diethyl phthalate	ND		ug/kg	230	--	1
Dimethyl phthalate	ND		ug/kg	230	--	1
Benzo(a)anthracene	ND		ug/kg	140	--	1
Benzo(a)pyrene	ND		ug/kg	180	--	1
Benzo(b)fluoranthene	ND		ug/kg	140	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986

Project Number: 0139-107911 **Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID:	L1502986-02	Date Collected:	02/17/15 09:45
Client ID:	CDM-5 5'-9'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	ND		ug/kg	140	--	1
Chrysene	ND		ug/kg	140	--	1
Acenaphthylene	ND		ug/kg	180	--	1
Anthracene	ND		ug/kg	140	--	1
Benzo(ghi)perylene	ND		ug/kg	180	--	1
Fluorene	ND		ug/kg	230	--	1
Phenanthrene	ND		ug/kg	140	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	140	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	180	--	1
Pyrene	ND		ug/kg	140	--	1
Aniline	ND		ug/kg	270	--	1
4-Chloroaniline	ND		ug/kg	230	--	1
Dibenzofuran	ND		ug/kg	230	--	1
2-Methylnaphthalene	ND		ug/kg	270	--	1
Acetophenone	ND		ug/kg	230	--	1
2,4,6-Trichlorophenol	ND		ug/kg	140	--	1
2-Chlorophenol	ND		ug/kg	230	--	1
2,4-Dichlorophenol	ND		ug/kg	200	--	1
2,4-Dimethylphenol	ND		ug/kg	230	--	1
2-Nitrophenol	ND		ug/kg	490	--	1
4-Nitrophenol	ND		ug/kg	320	--	1
2,4-Dinitrophenol	ND		ug/kg	1100	--	1
Pentachlorophenol	ND		ug/kg	460	--	1
Phenol	ND		ug/kg	230	--	1
2-Methylphenol	ND		ug/kg	230	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	330	--	1
2,4,5-Trichlorophenol	ND		ug/kg	230	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	60		30-130
Phenol-d6	63		30-130
Nitrobenzene-d5	68		30-130
2-Fluorobiphenyl	70		30-130
2,4,6-Tribromophenol	69		30-130
4-Terphenyl-d14	61		30-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/19/15 18:11
Analyst: JB

Extraction Method: EPA 3546
Extraction Date: 02/18/15 17:41

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG763494-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	98	--
Bis(2-chloroethyl)ether	ND		ug/kg	150	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	160	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	160	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	98	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	130	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--

451

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1502986
Project Number:	0139-107911	**Report Date:**	02/24/15

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8270D	Extraction Method:	EPA 3546
Analytical Date:	02/19/15 18:11	Extraction Date:	02/18/15 17:41
Analyst:	JB		

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG763494-1					
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	98	--
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	200	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	98	--
2-Chlorophenol	ND		ug/kg	160	--
2,4-Dichlorophenol	ND		ug/kg	150	--
2,4-Dimethylphenol	ND		ug/kg	160	--
2-Nitrophenol	ND		ug/kg	350	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	780	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	230	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1502986
Project Number:	0139-107911	**Report Date:**	02/24/15

Method Blank Analysis
Batch Quality Control

Analytical Method:	97,8270D	Extraction Method:	EPA 3546
Analytical Date:	02/19/15 18:11	Extraction Date:	02/18/15 17:41
Analyst:	JB		

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG763494-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	57		30-130
Phenol-d6	57		30-130
Nitrobenzene-d5	59		30-130
2-Fluorobiphenyl	63		30-130
2,4,6-Tribromophenol	63		30-130
4-Terphenyl-d14	65		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763494-2 WG763494-3								
Acenaphthene	73		67		40-140	9		30
1,2,4-Trichlorobenzene	78		73		40-140	7		30
Hexachlorobenzene	74		69		40-140	7		30
Bis(2-chloroethyl)ether	66		60		40-140	10		30
2-Chloronaphthalene	75		69		40-140	8		30
1,2-Dichlorobenzene	69		64		40-140	8		30
1,3-Dichlorobenzene	70		65		40-140	7		30
1,4-Dichlorobenzene	69		65		40-140	6		30
3,3'-Dichlorobenzidine	54		52		40-140	4		30
2,4-Dinitrotoluene	76		71		40-140	7		30
2,6-Dinitrotoluene	75		69		40-140	8		30
Azobenzene	86		79		40-140	8		30
Fluoranthene	76		70		40-140	8		30
4-Bromophenyl phenyl ether	75		71		40-140	5		30
Bis(2-chloroisopropyl)ether	60		57		40-140	5		30
Bis(2-chloroethoxy)methane	68		63		40-140	8		30
Hexachlorobutadiene	85		81		40-140	5		30
Hexachloroethane	74		68		40-140	8		30
Isophorone	69		65		40-140	6		30
Naphthalene	70		64		40-140	9		30
Nitrobenzene	77		71		40-140	8		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763494-2 WG763494-3								
Bis(2-Ethylhexyl)phthalate	88		83		40-140	6		30
Butyl benzyl phthalate	82		76		40-140	8		30
Di-n-butylphthalate	84		78		40-140	7		30
Di-n-octylphthalate	86		80		40-140	7		30
Diethyl phthalate	82		76		40-140	8		30
Dimethyl phthalate	78		73		40-140	7		30
Benzo(a)anthracene	77		72		40-140	7		30
Benzo(a)pyrene	76		72		40-140	5		30
Benzo(b)fluoranthene	74		72		40-140	3		30
Benzo(k)fluoranthene	78		71		40-140	9		30
Chrysene	75		71		40-140	5		30
Acenaphthylene	73		67		40-140	9		30
Anthracene	77		72		40-140	7		30
Benzo(ghi)perylene	73		68		40-140	7		30
Fluorene	75		70		40-140	7		30
Phenanthrene	74		70		40-140	6		30
Dibenzo(a,h)anthracene	74		69		40-140	7		30
Indeno(1,2,3-cd)Pyrene	73		68		40-140	7		30
Pyrene	75		70		40-140	7		30
Aniline	47		49		40-140	4		30
4-Chloroaniline	93		84		40-140	10		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763494-2 WG763494-3								
Dibenzofuran	78		72		40-140	8		30
2-Methylnaphthalene	76		69		40-140	10		30
Acetophenone	77		72		40-140	7		30
2,4,6-Trichlorophenol	84		78		30-130	7		30
2-Chlorophenol	75		68		30-130	10		30
2,4-Dichlorophenol	88		81		30-130	8		30
2,4-Dimethylphenol	84		76		30-130	10		30
2-Nitrophenol	71		67		30-130	6		30
4-Nitrophenol	96		90		30-130	6		30
2,4-Dinitrophenol	60		60		30-130	0		30
Pentachlorophenol	74		68		30-130	8		30
Phenol	73		67		30-130	9		30
2-Methylphenol	74		68		30-130	8		30
3-Methylphenol/4-Methylphenol	78		73		30-130	7		30
2,4,5-Trichlorophenol	85		77		30-130	10		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1502986
Project Number: 0139-107911
Report Date: 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763494-2 WG763494-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	73		66		30-130
Phenol-d6	74		68		30-130
Nitrobenzene-d5	77		69		30-130
2-Fluorobiphenyl	79		72		30-130
2,4,6-Tribromophenol	83		77		30-130
4-Terphenyl-d14	79		71		30-130

PETROLEUM HYDROCARBONS

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID:	L1502986-01	Date Collected:	02/17/15 09:30
Client ID:	CDM-5 1'-5'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/18/15 09:01
Analytical Date:	02/23/15 15:41	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/18/15
Percent Solids:	85%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	22.1		mg/kg	7.83	--	1
C19-C36 Aliphatics	146		mg/kg	7.83	--	1
C11-C22 Aromatics	149		mg/kg	7.83	--	1
C11-C22 Aromatics, Adjusted	148		mg/kg	7.83	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	63		40-140
o-Terphenyl	76		40-140
2-Fluorobiphenyl	89		40-140
2-Bromonaphthalene	81		40-140

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID:	L1502986-02	Date Collected:	02/17/15 09:45
Client ID:	CDM-5 5'-9'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/18/15 09:01
Analytical Date:	02/23/15 17:16	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/18/15
Percent Solids:	71%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	13.0		mg/kg	8.93	--	1
C19-C36 Aliphatics	38.5		mg/kg	8.93	--	1
C11-C22 Aromatics	56.6		mg/kg	8.93	--	1
C11-C22 Aromatics, Adjusted	56.6		mg/kg	8.93	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	55		40-140
o-Terphenyl	62		40-140
2-Fluorobiphenyl	76		40-140
2-Bromonaphthalene	70		40-140

Project Name: KING OPEN SCHOOL | **Lab Number:** L1502986
Project Number: 0139-107911 | **Report Date:** 02/24/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 02/23/15 10:28
Analyst: SR

Extraction Method: EPA 3546
Extraction Date: 02/18/15 09:01
Cleanup Method: EPH-04-1
Cleanup Date: 02/18/15

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG763356-1					
C9-C18 Aliphatics	ND		mg/kg	6.65	--
C19-C36 Aliphatics	ND		mg/kg	6.65	--
C11-C22 Aromatics	ND		mg/kg	6.65	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.65	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	65		40-140
o-Terphenyl	75		40-140
2-Fluorobiphenyl	78		40-140
2-Bromonaphthalene	80		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG763356-2 WG763356-3								
C9-C18 Aliphatics	67		67		40-140	0		25
C19-C36 Aliphatics	81		79		40-140	3		25
C11-C22 Aromatics	86		89		40-140	3		25
Naphthalene	70		76		40-140	8		25
2-Methylnaphthalene	75		82		40-140	9		25
Acenaphthylene	72		79		40-140	9		25
Acenaphthene	77		82		40-140	6		25
Fluorene	79		84		40-140	6		25
Phenanthrene	88		90		40-140	2		25
Anthracene	86		90		40-140	5		25
Fluoranthene	84		88		40-140	5		25
Pyrene	87		90		40-140	3		25
Benzo(a)anthracene	81		84		40-140	4		25
Chrysene	89		91		40-140	2		25
Benzo(b)fluoranthene	87		88		40-140	1		25
Benzo(k)fluoranthene	84		86		40-140	2		25
Benzo(a)pyrene	83		86		40-140	4		25
Indeno(1,2,3-cd)Pyrene	65		67		40-140	3		25
Dibenzo(a,h)anthracene	81		83		40-140	2		25
Benzo(ghi)perylene	80		83		40-140	4		25
Nonane (C9)	46		48		30-140	4		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1502986
Report Date: 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG763356-2 WG763356-3								
Decane (C10)	58		57		40-140	2		25
Dodecane (C12)	63		63		40-140	0		25
Tetradecane (C14)	68		68		40-140	0		25
Hexadecane (C16)	72		71		40-140	1		25
Octadecane (C18)	77		75		40-140	3		25
Nonadecane (C19)	78		76		40-140	3		25
Eicosane (C20)	78		76		40-140	3		25
Docosane (C22)	80		78		40-140	3		25
Tetracosane (C24)	79		77		40-140	3		25
Hexacosane (C26)	80		78		40-140	3		25
Octacosane (C28)	79		77		40-140	3		25
Triacontane (C30)	80		78		40-140	3		25
Hexatriacontane (C36)	78		75		40-140	4		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	66		69		40-140
o-Terphenyl	80		84		40-140
2-Fluorobiphenyl	79		84		40-140
2-Bromonaphthalene	81		84		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

PCBS

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1502986
Project Number:	0139-107911	**Report Date:**	02/24/15

SAMPLE RESULTS

Lab ID:	L1502986-01	Date Collected:	02/17/15 09:30
Client ID:	CDM-5 1'-5'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/18/15 10:54
Analytical Date:	02/19/15 14:33	Cleanup Method:	EPA 3665A
Analyst:	JT	Cleanup Date:	02/18/15
Percent Solids:	85%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/18/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	38.2	--	1	A
Aroclor 1221	ND		ug/kg	38.2	--	1	A
Aroclor 1232	ND		ug/kg	38.2	--	1	A
Aroclor 1242	ND		ug/kg	38.2	--	1	A
Aroclor 1248	ND		ug/kg	38.2	--	1	A
Aroclor 1254	ND		ug/kg	38.2	--	1	A
Aroclor 1260	ND		ug/kg	38.2	--	1	A
Aroclor 1262	ND		ug/kg	38.2	--	1	A
Aroclor 1268	ND		ug/kg	38.2	--	1	A
PCBs, Total	ND		ug/kg	38.2	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	31		30-150	A
Decachlorobiphenyl	**25**	Q	30-150	A
2,4,5,6-Tetrachloro-m-xylene	31		30-150	B
Decachlorobiphenyl	32		30-150	B

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

SAMPLE RESULTS

Lab ID:	L1502986-02	Date Collected:	02/17/15 09:45
Client ID:	CDM-5 5'-9'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/18/15 10:54
Analytical Date:	02/19/15 15:49	Cleanup Method:	EPA 3665A
Analyst:	JT	Cleanup Date:	02/18/15
Percent Solids:	71%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/18/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	45.0	--	1	A
Aroclor 1221	ND		ug/kg	45.0	--	1	A
Aroclor 1232	ND		ug/kg	45.0	--	1	A
Aroclor 1242	ND		ug/kg	45.0	--	1	A
Aroclor 1248	ND		ug/kg	45.0	--	1	A
Aroclor 1254	ND		ug/kg	45.0	--	1	A
Aroclor 1260	ND		ug/kg	45.0	--	1	A
Aroclor 1262	ND		ug/kg	45.0	--	1	A
Aroclor 1268	ND		ug/kg	45.0	--	1	A
PCBs, Total	ND		ug/kg	45.0	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	34		30-150	A
Decachlorobiphenyl	**29**	Q	30-150	A
2,4,5,6-Tetrachloro-m-xylene	36		30-150	B
Decachlorobiphenyl	33		30-150	B

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1502986
Report Date: 02/24/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 02/19/15 05:42
Analyst: JT

Extraction Method: EPA 3546
Extraction Date: 02/18/15 10:54
Cleanup Method: EPA 3665A
Cleanup Date: 02/18/15
Cleanup Method: EPA 3660B
Cleanup Date: 02/18/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-02 Batch: WG763413-1						
Aroclor 1016	ND		ug/kg	31.6	--	A
Aroclor 1221	ND		ug/kg	31.6	--	A
Aroclor 1232	ND		ug/kg	31.6	--	A
Aroclor 1242	ND		ug/kg	31.6	--	A
Aroclor 1248	ND		ug/kg	31.6	--	A
Aroclor 1254	ND		ug/kg	31.6	--	A
Aroclor 1260	ND		ug/kg	31.6	--	A
Aroclor 1262	ND		ug/kg	31.6	--	A
Aroclor 1268	ND		ug/kg	31.6	--	A
PCBs, Total	ND		ug/kg	31.6	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	65		30-150	A
Decachlorobiphenyl	51		30-150	A
2,4,5,6-Tetrachloro-m-xylene	65		30-150	B
Decachlorobiphenyl	51		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-02 Batch: WG763413-2 WG763413-3									
Aroclor 1016	82		82		40-140	0		30	A
Aroclor 1260	66		67		40-140	2		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	76		74		30-150	A
Decachlorobiphenyl	57		57		30-150	A
2,4,5,6-Tetrachloro-m-xylene	76		73		30-150	B
Decachlorobiphenyl	58		55		30-150	B

METALS

Project Name: KING OPEN SCHOOL　　**Lab Number:** L1502986
Project Number: 0139-107911　　**Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID: L1502986-01　　Date Collected: 02/17/15 09:30
Client ID: CDM-5 1'-5'　　Date Received: 02/17/15
Sample Location: CAMBRIDGE, MA　　Field Prep: Not Specified
Matrix: Soil
Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	6.3		mg/kg	0.47	--	1	02/18/15 11:56	02/18/15 17:09	EPA 3050B	97,6010C	BC
Barium, Total	47		mg/kg	0.47	--	1	02/18/15 11:56	02/18/15 17:09	EPA 3050B	97,6010C	BC
Cadmium, Total	ND		mg/kg	0.47	--	1	02/18/15 11:56	02/18/15 17:09	EPA 3050B	97,6010C	BC
Chromium, Total	18		mg/kg	0.47	--	1	02/18/15 11:56	02/18/15 17:09	EPA 3050B	97,6010C	BC
Lead, Total	100		mg/kg	2.3	--	1	02/18/15 11:56	02/18/15 17:09	EPA 3050B	97,6010C	BC
Mercury, Total	0.431		mg/kg	0.084	--	1	02/18/15 05:49	02/18/15 15:14	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.3	--	1	02/18/15 11:56	02/18/15 17:09	EPA 3050B	97,6010C	BC
Silver, Total	ND		mg/kg	0.47	--	1	02/18/15 11:56	02/18/15 17:09	EPA 3050B	97,6010C	BC

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986

Project Number: 0139-107911 **Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID: L1502986-02 Date Collected: 02/17/15 09:45

Client ID: CDM-5 5'-9' Date Received: 02/17/15

Sample Location: CAMBRIDGE, MA Field Prep: Not Specified

Matrix: Soil

Percent Solids: 71%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	5.8		mg/kg	0.54	--	1	02/18/15 11:56	02/18/15 17:12	EPA 3050B	97,6010C	BC
Barium, Total	38		mg/kg	0.54	--	1	02/18/15 11:56	02/18/15 17:12	EPA 3050B	97,6010C	BC
Cadmium, Total	ND		mg/kg	0.54	--	1	02/18/15 11:56	02/18/15 17:12	EPA 3050B	97,6010C	BC
Chromium, Total	15		mg/kg	0.54	--	1	02/18/15 11:56	02/18/15 17:12	EPA 3050B	97,6010C	BC
Lead, Total	36		mg/kg	2.7	--	1	02/18/15 11:56	02/18/15 17:12	EPA 3050B	97,6010C	BC
Mercury, Total	0.256		mg/kg	0.097	--	1	02/18/15 05:49	02/18/15 15:16	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.7	--	1	02/18/15 11:56	02/18/15 17:12	EPA 3050B	97,6010C	BC
Silver, Total	ND		mg/kg	0.54	--	1	02/18/15 11:56	02/18/15 17:12	EPA 3050B	97,6010C	BC

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG763310-1										
Mercury, Total	ND		mg/kg	0.083	--	1	02/18/15 05:49	02/18/15 14:52	97,7471B	MC

Prep Information

Digestion Method: EPA 7471B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG763423-1										
Arsenic, Total	ND		mg/kg	0.40	--	1	02/18/15 11:56	02/18/15 17:20	97,6010C	BC
Barium, Total	ND		mg/kg	0.40	--	1	02/18/15 11:56	02/18/15 17:20	97,6010C	BC
Cadmium, Total	ND		mg/kg	0.40	--	1	02/18/15 11:56	02/18/15 17:20	97,6010C	BC
Chromium, Total	ND		mg/kg	0.40	--	1	02/18/15 11:56	02/18/15 17:20	97,6010C	BC
Lead, Total	ND		mg/kg	2.0	--	1	02/18/15 11:56	02/18/15 17:20	97,6010C	BC
Selenium, Total	ND		mg/kg	2.0	--	1	02/18/15 11:56	02/18/15 17:20	97,6010C	BC
Silver, Total	ND		mg/kg	0.40	--	1	02/18/15 11:56	02/18/15 17:20	97,6010C	BC

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1502986
Report Date: 02/24/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG763310-2 WG763310-3 SRM Lot Number: D083-540								
Mercury, Total	119		117		75-126	2		30
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG763423-2 WG763423-3 SRM Lot Number: D083-540								
Arsenic, Total	98		98		78-122	0		30
Barium, Total	96		96		82-117	0		30
Cadmium, Total	94		89		82-118	5		30
Chromium, Total	98		95		79-121	3		30
Lead, Total	93		89		81-119	4		30
Selenium, Total	102		90		78-123	13		30
Silver, Total	102		94		74-125	8		30

INORGANICS
&
MISCELLANEOUS

Project Name: KING OPEN SCHOOL
Lab Number: L1502986
Project Number: 0139-107911
Report Date: 02/24/15

SAMPLE RESULTS

Lab ID: L1502986-01
Client ID: CDM-5 1'-5'
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Date Collected: 02/17/15 09:30
Date Received: 02/17/15
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	84.8		%	0.100	NA	1	-	02/17/15 23:20	30,2540G	RT

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

SAMPLE RESULTS

Lab ID: L1502986-02
Client ID: CDM-5 5'-9'
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Date Collected: 02/17/15 09:45
Date Received: 02/17/15
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	71.3		%	0.100	NA	1	-	02/17/15 23:20	30,2540G	RT

Lab Duplicate Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG763283-1 QC Sample: L1502978-01 Client ID: DUP Sample						
Solids, Total	16.9	16.5	%	2		20

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: 02/17/2015 18:00

Cooler Information Custody Seal

Cooler	
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1502986-01A	Vial MeOH preserved	A	N/A	2.0	Y	Absent	MCP-8260HLW-10(14)
L1502986-01B	Vial water preserved	A	N/A	2.0	Y	Absent	MCP-8260HLW-10(14)
L1502986-01C	Vial water preserved	A	N/A	2.0	Y	Absent	MCP-8260HLW-10(14)
L1502986-01D	Glass 120ml/4oz unpreserved	A	N/A	2.0	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP(),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1502986-01E	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP(),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1502986-02A	Vial MeOH preserved	A	N/A	2.0	Y	Absent	MCP-8260HLW-10(14)
L1502986-02B	Vial water preserved	A	N/A	2.0	Y	Absent	MCP-8260HLW-10(14)
L1502986-02C	Vial water preserved	A	N/A	2.0	Y	Absent	MCP-8260HLW-10(14)
L1502986-02D	Glass 120ml/4oz unpreserved	A	N/A	2.0	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1502986
Report Date: 02/24/15

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1502986-02E	Glass 250ml/8oz unpreserved	A	N/A	2.0	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)

Container Comments

L1502986-01D

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL	- Estimated 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 EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
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

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

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 ten times (10x) 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. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
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.

Report Format: Data Usability Report

Project Name: KING OPEN SCHOOL **Lab Number:** L1502986
Project Number: 0139-107911 **Report Date:** 02/24/15

Data Qualifiers

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 lower value for the two columns 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.

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.

S - Analytical results are from modified screening analysis.

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

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

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.

98 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, 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.

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: 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
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

Revised COC - MMM 2/18/15

Serial_No:02241515:28

CHAIN OF CUSTODY

PAGE ____ OF ____

Date Rec'd in Lab: 2/17/15

ALPHA Job #: L1502986

ALPHA ANALYTICAL

8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220

320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Project Information

Project Name: King Open School

Project Location: Cambridge, MA

Project #: 0139-107911

Project Manager: Jay McMillan

ALPHA Quote #:

Report Information - Data Deliverables

☑ ADEx ☑ EMAIL

Billing Information

☐ Same as Client info PO #:

Client Information

Client: CDM Smith

Address: 50 Hampshire St Cambridge MA 02139

Phone: 617-452-6419

Email: wroee@cdmsmith.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 ____ Criteria ____

Turn-Around Time

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

Date Due: 2/24/15

Additional Project Information:

Run TCLP if 20x Rule Exceeded

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; TCLP RCRA 8

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	VOC	SVOC	METALS (MCP)	METALS (RCRA)	EPH	VPH/PCB	TPH	TCLP RCRA 8	Sample Comments	Total # Bottles
02986-01	CDM-5 1'-5'	2/17	9:30	S	EW	X	X	X	X		X		~~X~~		5
-02	CDM-5 5'-9'	2/17	9:45	S	EW	X	X	X	X		X				5

	VOC	SVOC						
Container Type	V	V	P	A	A			
Preservative	A	F	P	A	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
Elizabeth Wroe	2/17/15 2:45	AAL	2/17/15 1570
AAL	2/17/15 1725	Richard Barrett	2/17/15 1725

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 ____ OF ____

ALPHA ANALYTICAL
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: 2/17/15

ALPHA Job #: L1502986

Client Information

Client: CDM Smith
Address: 50 Hampshire St
Cambridge MA 02139
Phone: 617-452-6419
Email: wroee@cdmsmith.com

Additional Project Information:

Run TCLP if 20x Rule Exceeded

Project Information

Project Name: King Open School
Project Location: Cambridge, MA
Project #: 0139-107911
Project Manager: Jay McMillan
ALPHA Quote #:

Turn-Around Time

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

Date Due: 2/24/15

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

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 ____ Criteria ____

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
TCLP RCRA 8

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	VOC	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	TCLP RCRA 8	Sample Comments	TOTAL # BOTTLES
02986-01	CDM-5 1'-5'	2/17	9:30	S	EW	X	X	X	X		X		X			5
02	CDM-5 5'-9'	2/17	9:45	S	EW	X	X	X	X		X					5

	VOC	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	TCLP RCRA 8
Container Type	V	V	P	A		A			
Preservative	A	F	P	A		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
Elizabeth Wroe	2/17/15 2:45	MSM AAL	2/17/15 1510
MSM	2/17/15 1725	Richard Bartt	2/17/15 1725

FORM NO: 01-01 (rev. 12-Mar-2012)

7A
Volatile Organics CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1502986

Instrument ID: Voa100.i   Calibration Date: 19-FEB-2015 Time: 09:04

Lab File ID: 0219A01   Init. Calib. Date(s): 29-JAN-2   29-JAN-2

Sample No: 8260 CCAL   Init. Calib. Times : 17:51   20:55

Compound	RRF (mean)	RRF	MIN RRF	%D	MAX %D	
dichlorodifluoromethane	.14266	.12206	.1	-14	20	
chloromethane	.18605	.19209	.1	3	20	
vinyl chloride	.24636	.24396	.1	-1	20	
bromomethane	.25017	.21676	.1	-13	20	
chloroethane	.23209	.21171	.1	-9	20	
trichlorofluoromethane	.51466	.403	.1	-22	20	F
ethyl ether	.13465	.16627	.05	23	20	F
1,1,-dichloroethene	.20492	.15998	.1	-22	20	F
carbon disulfide	.61246	.5327	.1	-13	20	
methylene chloride	.24904	.20701	.1	-17	20	
acetone	.06697	.06456	.1	-4	20	F
trans-1,2-dichloroethene	.2445	.19604	.1	-20	20	
methyl tert butyl ether	.66398	.56004	.1	-16	20	
Diisopropyl Ether	.68195	.59925	.05	-12	20	
1,1-dichloroethane	.40085	.33802	.2	-16	20	
Ethyl-Tert-Butyl-Ether	.70336	.6059	.05	-14	20	
cis-1,2-dichloroethene	.27398	.22599	.1	-18	20	
2,2-dichloropropane	.33034	.27639	.05	-16	20	
bromochloromethane	.13265	.11617	.05	-12	20	
chloroform	.44373	.36883	.2	-17	20	
carbontetrachloride	.36916	.2892	.1	-22	20	F
tetrahydrofuran	.06362	.05903	.05	-7	20	
1,1,1-trichloroethane	.39112	.31203	.1	-20	20	F
2-butanone	.10055	.09005	.1	-10	20	
1,1-dichloropropene	.31381	.25183	.05	-20	20	
benzene	.93159	.76132	.5	-18	20	
Tertiary-Amyl Methyl Ether	.66218	.55946	.05	-16	20	
1,2-dichloroethane	.30545	.27394	.1	-10	20	
trichloroethene	.25884	.20777	.2	-20	20	
dibromomethane	.15481	.13693	.05	-12	20	
1,2-dichloropropane	.22196	.19221	.1	-13	20	
bromodichloromethane	.35156	.30081	.2	-14	20	
1,4-dioxane	.0031	.00259	.05	-16	20	F
cis-1,3-dichloropropene	.38597	.32171	.2	-17	20	
toluene	.71945	.65114	.4	-9	20	
4-methyl-2-pentanone	.09048	.07273	.1	-20	20	F
tetrachloroethene	.32329	.28217	.2	-13	20	
trans-1,3-dichloropropene	.41417	.41256	.1	0	20	

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7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1502986

Instrument ID: Voa100.i   Calibration Date: 19-FEB-2015 Time: 09:04

Lab File ID: 0219A01   Init. Calib. Date(s): 29-JAN-2   29-JAN-2

Sample No: 8260 CCAL   Init. Calib. Times : 17:51   20:55

Compound	RRF (mean)	RRF	MIN RRF	%D	MAX %D	
1,1,2-trichloroethane	.20894	.20944	.1	0	20	
chlorodibromomethane	.34275	.32913	.1	-4	20	
1,3-dichloropropane	.40942	.4169	.05	2	20	
1,2-dibromoethane	.26597	.26152	.1	-2	20	
2-hexanone	.17623	.16324	.1	-7	20	
chlorobenzene	.84343	.78138	.5	-7	20	
ethyl benzene	1.3896	1.2484	.1	-10	20	
1,1,1,2-tetrachloroethane	.319	.29583	.05	-7	20	
p/m xylene	.56059	.50446	.1	-10	20	
o xylene	.54217	.48463	.3	-11	20	
styrene	.94666	.85028	.3	-10	20	
bromoform	.4302	.41634	.1	-3	20	
isopropylbenzene	2.4512	2.1837	.1	-11	20	
bromobenzene	.66085	.62912	.05	-5	20	
n-propylbenzene	1.7184	1.3326	.05	-22	20	F
1,1,2,2,-tetrachloroethane	.62878	.64644	.3	3	20	
2-chlorotoluene	1.7182	1.3326	.05	-22	20	F
1,3,5-trimethybenzene	2.0665	1.9319	.05	-7	20	
1,2,3-trichloropropane	.49719	.50301	.05	1	20	
4-chorotoluene	1.7121	1.6195	.05	-5	20	
tert-butylbenzene	1.7949	1.5984	.05	-11	20	
1,2,4-trimethylbenzene	2.0874	1.9515	.05	-7	20	
sec-butylbenzene	2.6713	2.4246	.05	-9	20	
p-isopropyltoluene	2.3059	2.0834	.05	-10	20	
1,3-dichlorobenzene	1.2643	1.2155	.6	-4	20	
1,4-dichlorobenzene	1.2960	1.2397	.5	-4	20	
n-butylbenzene	2.0275	1.9157	.05	-6	20	
1,2-dichlorobenzene	1.1870	1.1408	.4	-4	20	
1,2-dibromo-3-chloropropane	.12853	.12138	.05	-6	20	
hexachlorobutadiene	.41842	.36469	.05	-13	20	
1,2,4-trichlorobenzene	.83344	.79385	.2	-5	20	
naphthalene	2.1788	2.0381	.05	-6	20	
1,2,3-trichlorobenzene	.78421	.75463	.05	-4	20	
dibromofluoromethane	.28631	.27805	.05	-3	30	
1,2-dichloroethane-d4	.2542	.27433	.05	8	30	
toluene-d8	1.1506	1.2535	.05	9	30	
4-bromofluorobenzene	.83978	.82659	.05	-2	30	

FORM VII MCP-8260HLW-10

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ANALYTICAL REPORT

Lab Number:	L1503204
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Jay McMullen
Phone:	(617) 452-6303
Project Name:	KING OPEN SCHOOL
Project Number:	0139-107911
Report Date:	03/02/15

Certifications & Approvals: NY (11627), CT (PH-0141), NH (2206), NJ NELAP (MA015), RI (LAO00299), ME (MA00030), PA (68-02089), VA (460194), LA NELAP (03090), FL (E87814), TX (T104704419), WA (C954), USFWS (Permit #LE2069641), USDA (Permit #P330-11-00109), 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: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503204
Report Date: 03/02/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1503204-01	CDM-5 1'-5'	SOIL	CAMBRIDGE, MA	02/17/15 09:30	02/17/15

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503204
Project Number:	0139-107911	**Report Date:**	03/02/15

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: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503204
Report Date: 03/02/15

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. All specific QC 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. 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 (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar 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. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: KING OPEN SCHOOL **Lab Number:** L1503204
Project Number: 0139-107911 **Report Date:** 03/02/15

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: 03/02/15

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METALS

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503204
Project Number:	0139-107911	**Report Date:**	03/02/15

SAMPLE RESULTS

Lab ID:	L1503204-01	Date Collected:	02/17/15 09:30
Client ID:	CDM-5 1'-5'	Date Received:	02/17/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	TCLP/SPLP Ext. Date:	02/25/15 15:31

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Lead, TCLP	ND		mg/l	0.50	--	1	02/27/15 07:12	02/27/15 15:35	EPA 3015	1,6010C	TT

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503204
Report Date: 03/02/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab for sample(s): 01 Batch: WG764914-1										
Lead, TCLP	ND		mg/l	0.50	--	1	02/27/15 07:12	02/27/15 13:58	1,6010C	TT

Prep Information

Digestion Method: EPA 3015
TCLP/SPLP Extraction Date: 02/25/15 15:31

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL **Lab Number:** L1503204
Project Number: 0139-107911 **Report Date:** 03/02/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 Batch: WG764914-2								
Lead, TCLP	98		-		75-125	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503204
Report Date: 03/02/15

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG764914-4 QC Sample: L1503418-02 Client ID: MS Sample												
Lead, TCLP	ND	5.1	4.9	96		-	-		75-125	-		20

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Duplicate Analysis
Batch Quality Control

Lab Number: L1503204
Report Date: 03/02/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG764914-3 QC Sample: L1503418-02 Client ID: DUP Sample						
Lead, TCLP	ND	ND	mg/l	NC		20

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503204-01A	Amber 250ml unpreserved	A	N/A	2.0	Y	Absent	-
L1503204-01X	Plastic 120ml HNO3 preserved spl	A	<2	2.0	Y	Absent	PB-CI(180)
L1503204-01X9	Tumble Vessel	A	N/A	2.0	Y	Absent	-

*Values in parentheses indicate holding time in days

Project Name: KING OPEN SCHOOL **Lab Number:** L1503204

Project Number: 0139-107911 **Report Date:** 03/02/15

GLOSSARY

Acronyms

EDL - Estimated 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 EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

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

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

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 ten times (10x) 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. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

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.

Report Format: Data Usability Report

Project Name: KING OPEN SCHOOL **Lab Number:** L1503204
Project Number: 0139-107911 **Report Date:** 03/02/15

Data Qualifiers

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 lower value for the two columns 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.

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.

S - Analytical results are from modified screening analysis.

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

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

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.

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: 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
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

Revised COC - MMM 2/18/15

L1503204-02 2/25/15

CHAIN OF CUSTODY

PAGE ___ OF ___

ALPHA

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: 2/17/15

ALPHA Job #: ~~L1502986~~

Client Information

Client: CDM Smith
Address: 50 Hampshire St
Cambridge MA 02139
Phone: 617-452-6419
Email: wroee@cdmsmith.com

Project Information

Project Name: King Open School
Project Location: Cambridge, MA
Project #: 0139-107911
Project Manager: Jay McMillan
ALPHA Quote #:

Turn-Around Time

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

3/3/15

Date Due: ~~2/24/15~~

Report Information - Data Deliverables

☐ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

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 ___ Criteria ___

Additional Project Information:

03204-01

... 20x Rule Exceeded

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; TCLP-Pb

TCLP-Pb

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	VOC	SVOC	METALS	METALS	EPH	VPH	PCB/PEST	TPH	TCLP-Pb	Sample Comments	TOTAL # BOTTLES
~~02986-01~~	CDM-5 1'-5'	2/17	9:30	S	EW	X	X	X	X		X	X	X			5
02	CDM-5 5'-9'	2/17	9:45	S	EW	X	X	X	X		X					5

	VOC	SVOC	METALS	METALS	EPH	VPH	PCB/PEST	TPH
Container Type	V	V	P	A		A		
Preservative	A	F	P	A		A		

Container Type	Preservative
P= Plastic	A= None
A= Amber glass	B= HCl
V= Vial	C= HNO_3
G= Glass	D= H_2SO_4
B= Bacteria cup	E= NaOH
C= Cube	F= MeOH
O= Other	G= $NaHSO_4$
E= Encore	H = $Na_2S_2O_3$
D= BOD Bottle	I= Ascorbic Acid
	J = NH_4Cl
	K= Zn Acetate
	O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Elizabeth Wroe	2/17/15 2:45	AAL	2/17/15 1570
AAL	2/17/15 1725	Richard Bartlett	2/17/15 1725

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

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ANALYTICAL REPORT

Lab Number:	L1503035
Client:	CDM Smith, Inc. 1 Cambridge Place 50 Hampshire Street Cambridge, MA 02139
ATTN:	Jay McMullen
Phone:	(617) 452-6303
Project Name:	KING OPEN SCHOOL
Project Number:	0139-107911
Report Date:	02/25/15

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

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

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1503035-01	CDM-6 1'-4'	SOIL	CAMBRIDGE, MA	02/18/15 10:40	02/18/15
L1503035-02	CDM-6 4'-8'	SOIL	CAMBRIDGE, MA	02/18/15 11:15	02/18/15

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035
Project Number: 0139-107911 **Report Date:** 02/25/15

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).	YES
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)?	NO

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: KING OPEN SCHOOL **Lab Number:** L1503035
Project Number: 0139-107911 **Report Date:** 02/25/15

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. All specific QC 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. 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 (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar 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. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035
Project Number: 0139-107911 **Report Date:** 02/25/15

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Metals.

Volatile Organics

In reference to question H:

The initial calibration, associated with L1503035-01 and -02, did not meet the method required minimum response factor on the lowest calibration standard for 4-methyl-2-pentanone (0.05631) and 1,4-dioxane (0.00244), as well as the average response factor for 2-butanone, 4-methyl-2-pentanone, and 1,4-dioxane.

The initial calibration verification is outside acceptance criteria for dichlorodifluoromethane (144%), but within overall method criteria.

The continuing calibration standard, associated with L1503035-01 and -02, is outside the acceptance criteria for several compounds; however, it is within overall method allowances. A copy of the continuing calibration standard is included as an addendum to this report.

EPH

L1503035-02 has elevated detection limits due to the dilution required by the sample matrix.

In reference to question G:

L1503035-01 and -02: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question I:

All samples were analyzed for a subset of MCP compounds per the Chain of Custody.

Metals

In reference to question I:

All samples were analyzed for a subset of MCP elements per the Chain of Custody.

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 Michelle M. Morris

Title: Technical Director/Representative Date: 02/25/15

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ORGANICS

VOLATILES

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503035-01	Date Collected:	02/18/15 10:40
Client ID:	CDM-6 1'-4'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Analytical Method:	97,8260C		
Analytical Date:	02/20/15 17:51		
Analyst:	MV		
Percent Solids:	91%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	12	--	1
1,1-Dichloroethane	ND		ug/kg	1.8	--	1
Chloroform	ND		ug/kg	1.8	--	1
Carbon tetrachloride	ND		ug/kg	1.2	--	1
1,2-Dichloropropane	ND		ug/kg	4.2	--	1
Dibromochloromethane	ND		ug/kg	1.2	--	1
1,1,2-Trichloroethane	ND		ug/kg	1.8	--	1
Tetrachloroethene	ND		ug/kg	1.2	--	1
Chlorobenzene	ND		ug/kg	1.2	--	1
Trichlorofluoromethane	ND		ug/kg	4.8	--	1
1,2-Dichloroethane	ND		ug/kg	1.2	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.2	--	1
Bromodichloromethane	ND		ug/kg	1.2	--	1
trans-1,3-Dichloropropene	ND		ug/kg	1.2	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.2	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.2	--	1
1,1-Dichloropropene	ND		ug/kg	4.8	--	1
Bromoform	ND		ug/kg	4.8	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.2	--	1
Benzene	ND		ug/kg	1.2	--	1
Toluene	ND		ug/kg	1.8	--	1
Ethylbenzene	ND		ug/kg	1.2	--	1
Chloromethane	ND		ug/kg	4.8	--	1
Bromomethane	ND		ug/kg	2.4	--	1
Vinyl chloride	ND		ug/kg	2.4	--	1
Chloroethane	ND		ug/kg	2.4	--	1
1,1-Dichloroethene	ND		ug/kg	1.2	--	1
trans-1,2-Dichloroethene	ND		ug/kg	1.8	--	1
Trichloroethene	ND		ug/kg	1.2	--	1
1,2-Dichlorobenzene	ND		ug/kg	4.8	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID: L1503035-01 Date Collected: 02/18/15 10:40

Client ID: CDM-6 1'-4' Date Received: 02/18/15

Sample Location: CAMBRIDGE, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	4.8	--	1
1,4-Dichlorobenzene	ND		ug/kg	4.8	--	1
Methyl tert butyl ether	ND		ug/kg	2.4	--	1
p/m-Xylene	ND		ug/kg	2.4	--	1
o-Xylene	ND		ug/kg	2.4	--	1
Xylenes, Total	ND		ug/kg	2.4	--	1
cis-1,2-Dichloroethene	ND		ug/kg	1.2	--	1
1,2-Dichloroethene, Total	ND		ug/kg	1.2	--	1
Dibromomethane	ND		ug/kg	4.8	--	1
1,2,3-Trichloropropane	ND		ug/kg	4.8	--	1
Styrene	ND		ug/kg	2.4	--	1
Dichlorodifluoromethane	ND		ug/kg	12	--	1
Acetone	ND		ug/kg	43	--	1
Carbon disulfide	ND		ug/kg	4.8	--	1
Methyl ethyl ketone	ND		ug/kg	12	--	1
Methyl isobutyl ketone	ND		ug/kg	12	--	1
2-Hexanone	ND		ug/kg	12	--	1
Bromochloromethane	ND		ug/kg	4.8	--	1
Tetrahydrofuran	ND		ug/kg	4.8	--	1
2,2-Dichloropropane	ND		ug/kg	6.0	--	1
1,2-Dibromoethane	ND		ug/kg	4.8	--	1
1,3-Dichloropropane	ND		ug/kg	4.8	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.2	--	1
Bromobenzene	ND		ug/kg	6.0	--	1
n-Butylbenzene	ND		ug/kg	1.2	--	1
sec-Butylbenzene	ND		ug/kg	1.2	--	1
tert-Butylbenzene	ND		ug/kg	4.8	--	1
o-Chlorotoluene	ND		ug/kg	4.8	--	1
p-Chlorotoluene	ND		ug/kg	4.8	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.8	--	1
Hexachlorobutadiene	ND		ug/kg	4.8	--	1
Isopropylbenzene	ND		ug/kg	1.2	--	1
p-Isopropyltoluene	ND		ug/kg	1.2	--	1
Naphthalene	ND		ug/kg	4.8	--	1
n-Propylbenzene	ND		ug/kg	1.2	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	4.8	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	4.8	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	4.8	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	4.8	--	1

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Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503035
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503035-01	Date Collected:	02/18/15 10:40
Client ID:	CDM-6 1'-4'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	6.0	--	1
Diisopropyl Ether	ND		ug/kg	4.8	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	4.8	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	4.8	--	1
1,4-Dioxane	ND		ug/kg	48	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	104		70-130
Dibromofluoromethane	101		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID: L1503035-02
Client ID: CDM-6 4'-8'
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 02/20/15 18:18
Analyst: MV
Percent Solids: 86%

Date Collected: 02/18/15 11:15
Date Received: 02/18/15
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	19	--	1
1,1-Dichloroethane	ND		ug/kg	2.9	--	1
Chloroform	ND		ug/kg	2.9	--	1
Carbon tetrachloride	ND		ug/kg	1.9	--	1
1,2-Dichloropropane	ND		ug/kg	6.8	--	1
Dibromochloromethane	ND		ug/kg	1.9	--	1
1,1,2-Trichloroethane	ND		ug/kg	2.9	--	1
Tetrachloroethene	ND		ug/kg	1.9	--	1
Chlorobenzene	ND		ug/kg	1.9	--	1
Trichlorofluoromethane	ND		ug/kg	7.8	--	1
1,2-Dichloroethane	ND		ug/kg	1.9	--	1
1,1,1-Trichloroethane	ND		ug/kg	1.9	--	1
Bromodichloromethane	ND		ug/kg	1.9	--	1
trans-1,3-Dichloropropene	ND		ug/kg	1.9	--	1
cis-1,3-Dichloropropene	ND		ug/kg	1.9	--	1
1,3-Dichloropropene, Total	ND		ug/kg	1.9	--	1
1,1-Dichloropropene	ND		ug/kg	7.8	--	1
Bromoform	ND		ug/kg	7.8	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.9	--	1
Benzene	ND		ug/kg	1.9	--	1
Toluene	ND		ug/kg	2.9	--	1
Ethylbenzene	ND		ug/kg	1.9	--	1
Chloromethane	ND		ug/kg	7.8	--	1
Bromomethane	ND		ug/kg	3.9	--	1
Vinyl chloride	ND		ug/kg	3.9	--	1
Chloroethane	ND		ug/kg	3.9	--	1
1,1-Dichloroethene	ND		ug/kg	1.9	--	1
trans-1,2-Dichloroethene	ND		ug/kg	2.9	--	1
Trichloroethene	ND		ug/kg	1.9	--	1
1,2-Dichlorobenzene	ND		ug/kg	7.8	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503035-02	Date Collected:	02/18/15 11:15
Client ID:	CDM-6 4'-8'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	7.8	--	1
1,4-Dichlorobenzene	ND		ug/kg	7.8	--	1
Methyl tert butyl ether	ND		ug/kg	3.9	--	1
p/m-Xylene	ND		ug/kg	3.9	--	1
o-Xylene	ND		ug/kg	3.9	--	1
Xylenes, Total	ND		ug/kg	3.9	--	1
cis-1,2-Dichloroethene	ND		ug/kg	1.9	--	1
1,2-Dichloroethene, Total	ND		ug/kg	1.9	--	1
Dibromomethane	ND		ug/kg	7.8	--	1
1,2,3-Trichloropropane	ND		ug/kg	7.8	--	1
Styrene	ND		ug/kg	3.9	--	1
Dichlorodifluoromethane	ND		ug/kg	19	--	1
Acetone	ND		ug/kg	70	--	1
Carbon disulfide	ND		ug/kg	7.8	--	1
Methyl ethyl ketone	ND		ug/kg	19	--	1
Methyl isobutyl ketone	ND		ug/kg	19	--	1
2-Hexanone	ND		ug/kg	19	--	1
Bromochloromethane	ND		ug/kg	7.8	--	1
Tetrahydrofuran	ND		ug/kg	7.8	--	1
2,2-Dichloropropane	ND		ug/kg	9.7	--	1
1,2-Dibromoethane	ND		ug/kg	7.8	--	1
1,3-Dichloropropane	ND		ug/kg	7.8	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.9	--	1
Bromobenzene	ND		ug/kg	9.7	--	1
n-Butylbenzene	ND		ug/kg	1.9	--	1
sec-Butylbenzene	ND		ug/kg	1.9	--	1
tert-Butylbenzene	ND		ug/kg	7.8	--	1
o-Chlorotoluene	ND		ug/kg	7.8	--	1
p-Chlorotoluene	ND		ug/kg	7.8	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	7.8	--	1
Hexachlorobutadiene	ND		ug/kg	7.8	--	1
Isopropylbenzene	ND		ug/kg	1.9	--	1
p-Isopropyltoluene	ND		ug/kg	1.9	--	1
Naphthalene	ND		ug/kg	7.8	--	1
n-Propylbenzene	ND		ug/kg	1.9	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	7.8	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	7.8	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	7.8	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	7.8	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503035-02	Date Collected:	02/18/15 11:15
Client ID:	CDM-6 4'-8'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by 8260/5035 - Westborough Lab						
Diethyl ether	ND		ug/kg	9.7	--	1
Diisopropyl Ether	ND		ug/kg	7.8	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	7.8	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	7.8	--	1
1,4-Dioxane	ND		ug/kg	78	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	100		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	105		70-130
Dibromofluoromethane	99		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035
Project Number: 0139-107911 **Report Date:** 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/20/15 09:56
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG764099-3					
Methylene chloride	ND		ug/kg	10	--
1,1-Dichloroethane	ND		ug/kg	1.5	--
Chloroform	ND		ug/kg	1.5	--
Carbon tetrachloride	ND		ug/kg	1.0	--
1,2-Dichloropropane	ND		ug/kg	3.5	--
Dibromochloromethane	ND		ug/kg	1.0	--
1,1,2-Trichloroethane	ND		ug/kg	1.5	--
Tetrachloroethene	ND		ug/kg	1.0	--
Chlorobenzene	ND		ug/kg	1.0	--
Trichlorofluoromethane	ND		ug/kg	4.0	--
1,2-Dichloroethane	ND		ug/kg	1.0	--
1,1,1-Trichloroethane	ND		ug/kg	1.0	--
Bromodichloromethane	ND		ug/kg	1.0	--
trans-1,3-Dichloropropene	ND		ug/kg	1.0	--
cis-1,3-Dichloropropene	ND		ug/kg	1.0	--
1,3-Dichloropropene, Total	ND		ug/kg	1.0	--
1,1-Dichloropropene	ND		ug/kg	4.0	--
Bromoform	ND		ug/kg	4.0	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	--
Benzene	ND		ug/kg	1.0	--
Toluene	ND		ug/kg	1.5	--
Ethylbenzene	ND		ug/kg	1.0	--
Chloromethane	ND		ug/kg	4.0	--
Bromomethane	ND		ug/kg	2.0	--
Vinyl chloride	ND		ug/kg	2.0	--
Chloroethane	ND		ug/kg	2.0	--
1,1-Dichloroethene	ND		ug/kg	1.0	--
trans-1,2-Dichloroethene	ND		ug/kg	1.5	--
Trichloroethene	ND		ug/kg	1.0	--

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503035
Project Number:	0139-107911	**Report Date:**	02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/20/15 09:56
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG764099-3					
1,2-Dichlorobenzene	ND		ug/kg	4.0	--
1,3-Dichlorobenzene	ND		ug/kg	4.0	--
1,4-Dichlorobenzene	ND		ug/kg	4.0	--
Methyl tert butyl ether	ND		ug/kg	2.0	--
p/m-Xylene	ND		ug/kg	2.0	--
o-Xylene	ND		ug/kg	2.0	--
Xylenes, Total	ND		ug/kg	2.0	--
cis-1,2-Dichloroethene	ND		ug/kg	1.0	--
1,2-Dichloroethene, Total	ND		ug/kg	1.0	--
Dibromomethane	ND		ug/kg	4.0	--
1,2,3-Trichloropropane	ND		ug/kg	4.0	--
Styrene	ND		ug/kg	2.0	--
Dichlorodifluoromethane	ND		ug/kg	10	--
Acetone	ND		ug/kg	36	--
Carbon disulfide	ND		ug/kg	4.0	--
Methyl ethyl ketone	ND		ug/kg	10	--
Methyl isobutyl ketone	ND		ug/kg	10	--
2-Hexanone	ND		ug/kg	10	--
Bromochloromethane	ND		ug/kg	4.0	--
Tetrahydrofuran	ND		ug/kg	4.0	--
2,2-Dichloropropane	ND		ug/kg	5.0	--
1,2-Dibromoethane	ND		ug/kg	4.0	--
1,3-Dichloropropane	ND		ug/kg	4.0	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	--
Bromobenzene	ND		ug/kg	5.0	--
n-Butylbenzene	ND		ug/kg	1.0	--
sec-Butylbenzene	ND		ug/kg	1.0	--
tert-Butylbenzene	ND		ug/kg	4.0	--
o-Chlorotoluene	ND		ug/kg	4.0	--

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503035
Project Number:	0139-107911	**Report Date:**	02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 02/20/15 09:56
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02 Batch: WG764099-3					
p-Chlorotoluene	ND		ug/kg	4.0	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.0	--
Hexachlorobutadiene	ND		ug/kg	4.0	--
Isopropylbenzene	ND		ug/kg	1.0	--
p-Isopropyltoluene	ND		ug/kg	1.0	--
Naphthalene	ND		ug/kg	4.0	--
n-Propylbenzene	ND		ug/kg	1.0	--
1,2,3-Trichlorobenzene	ND		ug/kg	4.0	--
1,2,4-Trichlorobenzene	ND		ug/kg	4.0	--
1,3,5-Trimethylbenzene	ND		ug/kg	4.0	--
1,2,4-Trimethylbenzene	ND		ug/kg	4.0	--
Diethyl ether	ND		ug/kg	5.0	--
Diisopropyl Ether	ND		ug/kg	4.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	4.0	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	4.0	--
1,4-Dioxane	ND		ug/kg	40	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	101		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	101		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1503035
Project Number: 0139-107911
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG764099-1 WG764099-2								
Methylene chloride	93		95		70-130	2		20
1,1-Dichloroethane	99		102		70-130	3		20
Chloroform	104		107		70-130	3		20
Carbon tetrachloride	106		110		70-130	4		20
1,2-Dichloropropane	110		112		70-130	2		20
Dibromochloromethane	104		106		70-130	2		20
1,1,2-Trichloroethane	104		104		70-130	0		20
Tetrachloroethene	109		114		70-130	4		20
Chlorobenzene	105		109		70-130	4		20
Trichlorofluoromethane	91		94		70-130	3		20
1,2-Dichloroethane	100		101		70-130	1		20
1,1,1-Trichloroethane	106		109		70-130	3		20
Bromodichloromethane	112		113		70-130	1		20
trans-1,3-Dichloropropene	103		106		70-130	3		20
cis-1,3-Dichloropropene	112		113		70-130	1		20
1,1-Dichloropropene	106		109		70-130	3		20
Bromoform	100		103		70-130	3		20
1,1,2,2-Tetrachloroethane	100		100		70-130	0		20
Benzene	103		106		70-130	3		20
Toluene	102		106		70-130	4		20
Ethylbenzene	112		114		70-130	2		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG764099-1 WG764099-2								
Chloromethane	**65**	Q	**69**	Q	70-130	6		20
Bromomethane	**69**	Q	75		70-130	8		20
Vinyl chloride	73		74		70-130	1		20
Chloroethane	88		91		70-130	3		20
1,1-Dichloroethene	80		88		70-130	10		20
trans-1,2-Dichloroethene	96		96		70-130	0		20
Trichloroethene	109		114		70-130	4		20
1,2-Dichlorobenzene	104		108		70-130	4		20
1,3-Dichlorobenzene	107		111		70-130	4		20
1,4-Dichlorobenzene	105		108		70-130	3		20
Methyl tert butyl ether	97		96		70-130	1		20
p/m-Xylene	112		116		70-130	4		20
o-Xylene	110		114		70-130	4		20
cis-1,2-Dichloroethene	101		104		70-130	3		20
Dibromomethane	102		101		70-130	1		20
1,2,3-Trichloropropane	100		98		70-130	2		20
Styrene	110		114		70-130	4		20
Dichlorodifluoromethane	**58**	Q	**58**	Q	70-130	0		20
Acetone	114		97		70-130	16		20
Carbon disulfide	74		82		70-130	10		20
Methyl ethyl ketone	102		99		70-130	3		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG764099-1 WG764099-2								
Methyl isobutyl ketone	113		108		70-130	5		20
2-Hexanone	102		95		70-130	7		20
Bromochloromethane	99		100		70-130	1		20
Tetrahydrofuran	103		95		70-130	8		20
2,2-Dichloropropane	105		106		70-130	1		20
1,2-Dibromoethane	98		99		70-130	1		20
1,3-Dichloropropane	102		103		70-130	1		20
1,1,1,2-Tetrachloroethane	107		109		70-130	2		20
Bromobenzene	102		106		70-130	4		20
n-Butylbenzene	121		126		70-130	4		20
sec-Butylbenzene	114		118		70-130	3		20
tert-Butylbenzene	111		115		70-130	4		20
o-Chlorotoluene	106		112		70-130	6		20
p-Chlorotoluene	110		114		70-130	4		20
1,2-Dibromo-3-chloropropane	96		93		70-130	3		20
Hexachlorobutadiene	114		116		70-130	2		20
Isopropylbenzene	110		116		70-130	5		20
p-Isopropyltoluene	116		120		70-130	3		20
Naphthalene	95		94		70-130	1		20
n-Propylbenzene	114		119		70-130	4		20
1,2,3-Trichlorobenzene	103		105		70-130	2		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02 Batch: WG764099-1 WG764099-2								
1,2,4-Trichlorobenzene	109		111		70-130	2		20
1,3,5-Trimethylbenzene	111		116		70-130	4		20
1,2,4-Trimethylbenzene	110		115		70-130	4		20
Diethyl ether	98		97		70-130	1		20
Diisopropyl Ether	107		108		70-130	1		20
Ethyl-Tert-Butyl-Ether	103		103		70-130	0		20
Tertiary-Amyl Methyl Ether	103		104		70-130	1		20
1,4-Dioxane	98		94		70-130	4		20

Surrogate	*LCS %Recovery*	*Qual*	*LCSD %Recovery*	*Qual*	*Acceptance Criteria*
1,2-Dichloroethane-d4	98		96		70-130
Toluene-d8	97		97		70-130
4-Bromofluorobenzene	102		102		70-130
Dibromofluoromethane	101		99		70-130

SEMIVOLATILES

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503035-01	Date Collected:	02/18/15 10:40
Client ID:	CDM-6 1'-4'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/19/15 13:50
Analytical Date:	02/20/15 20:08		
Analyst:	RC		
Percent Solids:	91%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	140	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	--	1
Hexachlorobenzene	ND		ug/kg	110	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	--	1
2-Chloronaphthalene	ND		ug/kg	180	--	1
1,2-Dichlorobenzene	ND		ug/kg	180	--	1
1,3-Dichlorobenzene	ND		ug/kg	180	--	1
1,4-Dichlorobenzene	ND		ug/kg	180	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	--	1
2,4-Dinitrotoluene	ND		ug/kg	180	--	1
2,6-Dinitrotoluene	ND		ug/kg	180	--	1
Azobenzene	ND		ug/kg	180	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	210	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	--	1
Hexachlorobutadiene	ND		ug/kg	180	--	1
Hexachloroethane	ND		ug/kg	140	--	1
Isophorone	ND		ug/kg	160	--	1
Naphthalene	ND		ug/kg	180	--	1
Nitrobenzene	ND		ug/kg	160	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	180	--	1
Butyl benzyl phthalate	ND		ug/kg	180	--	1
Di-n-butylphthalate	ND		ug/kg	180	--	1
Di-n-octylphthalate	ND		ug/kg	180	--	1
Diethyl phthalate	ND		ug/kg	180	--	1
Dimethyl phthalate	ND		ug/kg	180	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1
Benzo(a)pyrene	ND		ug/kg	140	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503035

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID: L1503035-01 Date Collected: 02/18/15 10:40

Client ID: CDM-6 1'-4' Date Received: 02/18/15

Sample Location: CAMBRIDGE, MA Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	140	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	140	--	1
Fluorene	ND		ug/kg	180	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	140	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	210	--	1
4-Chloroaniline	ND		ug/kg	180	--	1
Dibenzofuran	ND		ug/kg	180	--	1
2-Methylnaphthalene	ND		ug/kg	210	--	1
Acetophenone	ND		ug/kg	180	--	1
2,4,6-Trichlorophenol	ND		ug/kg	110	--	1
2-Chlorophenol	ND		ug/kg	180	--	1
2,4-Dichlorophenol	ND		ug/kg	160	--	1
2,4-Dimethylphenol	ND		ug/kg	180	--	1
2-Nitrophenol	ND		ug/kg	390	--	1
4-Nitrophenol	ND		ug/kg	250	--	1
2,4-Dinitrophenol	ND		ug/kg	860	--	1
Pentachlorophenol	ND		ug/kg	360	--	1
Phenol	ND		ug/kg	180	--	1
2-Methylphenol	ND		ug/kg	180	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	--	1
2,4,5-Trichlorophenol	ND		ug/kg	180	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	72		30-130
Phenol-d6	73		30-130
Nitrobenzene-d5	77		30-130
2-Fluorobiphenyl	76		30-130
2,4,6-Tribromophenol	77		30-130
4-Terphenyl-d14	66		30-130

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503035

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503035-02	Date Collected:	02/18/15 11:15
Client ID:	CDM-6 4'-8'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8270D	Extraction Date:	02/19/15 13:50
Analytical Date:	02/20/15 20:35		
Analyst:	RC		
Percent Solids:	86%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	--	1
Hexachlorobenzene	ND		ug/kg	120	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	--	1
2-Chloronaphthalene	ND		ug/kg	190	--	1
1,2-Dichlorobenzene	ND		ug/kg	190	--	1
1,3-Dichlorobenzene	ND		ug/kg	190	--	1
1,4-Dichlorobenzene	ND		ug/kg	190	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	--	1
2,4-Dinitrotoluene	ND		ug/kg	190	--	1
2,6-Dinitrotoluene	ND		ug/kg	190	--	1
Azobenzene	ND		ug/kg	190	--	1
Fluoranthene	ND		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	--	1
Hexachlorobutadiene	ND		ug/kg	190	--	1
Hexachloroethane	ND		ug/kg	150	--	1
Isophorone	ND		ug/kg	170	--	1
Naphthalene	ND		ug/kg	190	--	1
Nitrobenzene	ND		ug/kg	170	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	190	--	1
Butyl benzyl phthalate	ND		ug/kg	190	--	1
Di-n-butylphthalate	ND		ug/kg	190	--	1
Di-n-octylphthalate	ND		ug/kg	190	--	1
Diethyl phthalate	ND		ug/kg	190	--	1
Dimethyl phthalate	ND		ug/kg	190	--	1
Benzo(a)anthracene	170		ug/kg	120	--	1
Benzo(a)pyrene	410		ug/kg	150	--	1
Benzo(b)fluoranthene	400		ug/kg	120	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035

Project Number: 0139-107911 **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503035-02	Date Collected:	02/18/15 11:15
Client ID:	CDM-6 4'-8'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	170		ug/kg	120	--	1
Chrysene	150		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	310		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	120	--	1
Indeno(1,2,3-cd)Pyrene	320		ug/kg	150	--	1
Pyrene	120		ug/kg	120	--	1
Aniline	ND		ug/kg	230	--	1
4-Chloroaniline	ND		ug/kg	190	--	1
Dibenzofuran	ND		ug/kg	190	--	1
2-Methylnaphthalene	ND		ug/kg	230	--	1
Acetophenone	ND		ug/kg	190	--	1
2,4,6-Trichlorophenol	ND		ug/kg	120	--	1
2-Chlorophenol	ND		ug/kg	190	--	1
2,4-Dichlorophenol	ND		ug/kg	170	--	1
2,4-Dimethylphenol	ND		ug/kg	190	--	1
2-Nitrophenol	ND		ug/kg	420	--	1
4-Nitrophenol	ND		ug/kg	270	--	1
2,4-Dinitrophenol	ND		ug/kg	930	--	1
Pentachlorophenol	ND		ug/kg	390	--	1
Phenol	ND		ug/kg	190	--	1
2-Methylphenol	ND		ug/kg	190	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	280	--	1
2,4,5-Trichlorophenol	ND		ug/kg	190	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	72		30-130
Phenol-d6	75		30-130
Nitrobenzene-d5	77		30-130
2-Fluorobiphenyl	80		30-130
2,4,6-Tribromophenol	83		30-130
4-Terphenyl-d14	57		30-130

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/20/15 14:02
Analyst: RC

Extraction Method: EPA 3546
Extraction Date: 02/19/15 13:50

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG763563-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	99	--
Bis(2-chloroethyl)ether	ND		ug/kg	150	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	160	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	160	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	99	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	130	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	160	--
Benzo(a)anthracene	ND		ug/kg	99	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035
Project Number: 0139-107911 **Report Date:** 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/20/15 14:02
Analyst: RC

Extraction Method: EPA 3546
Extraction Date: 02/19/15 13:50

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG763563-1					
Benzo(b)fluoranthene	ND		ug/kg	99	--
Benzo(k)fluoranthene	ND		ug/kg	99	--
Chrysene	ND		ug/kg	99	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	99	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	99	--
Dibenzo(a,h)anthracene	ND		ug/kg	99	--
Indeno(1,2,3-cd)Pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	99	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	200	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	99	--
2-Chlorophenol	ND		ug/kg	160	--
2,4-Dichlorophenol	ND		ug/kg	150	--
2,4-Dimethylphenol	ND		ug/kg	160	--
2-Nitrophenol	ND		ug/kg	360	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	790	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--

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Project Name: KING OPEN SCHOOL **Lab Number:** L1503035
Project Number: 0139-107911 **Report Date:** 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 02/20/15 14:02
Analyst: RC

Extraction Method: EPA 3546
Extraction Date: 02/19/15 13:50

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG763563-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	59		30-130
Phenol-d6	62		30-130
Nitrobenzene-d5	56		30-130
2-Fluorobiphenyl	63		30-130
2,4,6-Tribromophenol	88		30-130
4-Terphenyl-d14	89		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763563-2 WG763563-3								
Acenaphthene	92		95		40-140	3		30
1,2,4-Trichlorobenzene	91		93		40-140	2		30
Hexachlorobenzene	99		100		40-140	1		30
Bis(2-chloroethyl)ether	84		86		40-140	2		30
2-Chloronaphthalene	97		98		40-140	1		30
1,2-Dichlorobenzene	85		85		40-140	0		30
1,3-Dichlorobenzene	84		89		40-140	6		30
1,4-Dichlorobenzene	85		86		40-140	1		30
3,3'-Dichlorobenzidine	54		54		40-140	0		30
2,4-Dinitrotoluene	108		110		40-140	2		30
2,6-Dinitrotoluene	105		107		40-140	2		30
Azobenzene	85		89		40-140	5		30
Fluoranthene	96		97		40-140	1		30
4-Bromophenyl phenyl ether	99		102		40-140	3		30
Bis(2-chloroisopropyl)ether	81		82		40-140	1		30
Bis(2-chloroethoxy)methane	90		90		40-140	0		30
Hexachlorobutadiene	98		98		40-140	0		30
Hexachloroethane	85		88		40-140	3		30
Isophorone	91		91		40-140	0		30
Naphthalene	88		89		40-140	1		30
Nitrobenzene	85		86		40-140	1		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503035
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763563-2 WG763563-3								
Bis(2-Ethylhexyl)phthalate	102		106		40-140	4		30
Butyl benzyl phthalate	99		103		40-140	4		30
Di-n-butylphthalate	95		100		40-140	5		30
Di-n-octylphthalate	98		102		40-140	4		30
Diethyl phthalate	95		97		40-140	2		30
Dimethyl phthalate	90		94		40-140	4		30
Benzo(a)anthracene	95		99		40-140	4		30
Benzo(a)pyrene	103		104		40-140	1		30
Benzo(b)fluoranthene	95		96		40-140	1		30
Benzo(k)fluoranthene	98		99		40-140	1		30
Chrysene	94		96		40-140	2		30
Acenaphthylene	98		96		40-140	2		30
Anthracene	95		99		40-140	4		30
Benzo(ghi)perylene	95		99		40-140	4		30
Fluorene	95		96		40-140	1		30
Phenanthrene	90		93		40-140	3		30
Dibenzo(a,h)anthracene	100		103		40-140	3		30
Indeno(1,2,3-cd)Pyrene	102		104		40-140	2		30
Pyrene	94		97		40-140	3		30
Aniline	47		50		40-140	6		30
4-Chloroaniline	85		91		40-140	7		30

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Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763563-2 WG763563-3								
Dibenzofuran	93		94		40-140	1		30
2-Methylnaphthalene	92		93		40-140	1		30
Acetophenone	92		90		40-140	2		30
2,4,6-Trichlorophenol	106		104		30-130	2		30
2-Chlorophenol	94		94		30-130	0		30
2,4-Dichlorophenol	100		100		30-130	0		30
2,4-Dimethylphenol	94		94		30-130	0		30
2-Nitrophenol	104		100		30-130	4		30
4-Nitrophenol	100		105		30-130	5		30
2,4-Dinitrophenol	85		89		30-130	5		30
Pentachlorophenol	99		101		30-130	2		30
Phenol	83		85		30-130	2		30
2-Methylphenol	92		93		30-130	1		30
3-Methylphenol/4-Methylphenol	97		95		30-130	2		30
2,4,5-Trichlorophenol	107		103		30-130	4		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG763563-2 WG763563-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	84		86		30-130
Phenol-d6	89		90		30-130
Nitrobenzene-d5	86		87		30-130
2-Fluorobiphenyl	89		88		30-130
2,4,6-Tribromophenol	102		105		30-130
4-Terphenyl-d14	86		87		30-130

PETROLEUM HYDROCARBONS

Project Name: KING OPEN SCHOOL | **Lab Number:** L1503035
Project Number: 0139-107911 | **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503035-01 D	Date Collected:	02/18/15 10:40
Client ID:	CDM-6 1'-4'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/19/15 08:44
Analytical Date:	02/20/15 23:28	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/19/15
Percent Solids:	91%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	34.4	--	5
C19-C36 Aliphatics	128		mg/kg	34.4	--	5
C11-C22 Aromatics	131		mg/kg	34.4	--	5
C11-C22 Aromatics, Adjusted	131		mg/kg	34.4	--	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	79		40-140
o-Terphenyl	82		40-140
2-Fluorobiphenyl	67		40-140
2-Bromonaphthalene	67		40-140

SAMPLE RESULTS

Lab ID:	L1503035-02 D	Date Collected:	02/18/15 11:15
Client ID:	CDM-6 4'-8'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	98,EPH-04-1.1	Extraction Date:	02/19/15 08:44
Analytical Date:	02/23/15 14:50	Cleanup Method1:	EPH-04-1
Analyst:	SR	Cleanup Date1:	02/23/15
Percent Solids:	86%		

Quality Control Information

Condition of sample received:	Satisfactory
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		mg/kg	36.6	--	5
C19-C36 Aliphatics	ND		mg/kg	36.6	--	5
C11-C22 Aromatics	ND		mg/kg	36.6	--	5
C11-C22 Aromatics, Adjusted	ND		mg/kg	36.6	--	5

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	70		40-140
o-Terphenyl	83		40-140
2-Fluorobiphenyl	67		40-140
2-Bromonaphthalene	68		40-140

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 02/20/15 11:00
Analyst: SR

Extraction Method: EPA 3546
Extraction Date: 02/19/15 08:44
Cleanup Method: EPH-04-1
Cleanup Date: 02/19/15

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG763567-1					
C9-C18 Aliphatics	ND		mg/kg	6.55	--
C19-C36 Aliphatics	ND		mg/kg	6.55	--
C11-C22 Aromatics	ND		mg/kg	6.55	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.55	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	42		40-140
o-Terphenyl	69		40-140
2-Fluorobiphenyl	68		40-140
2-Bromonaphthalene	64		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG763567-2 WG763567-3								
C9-C18 Aliphatics	60		60		40-140	0		25
C19-C36 Aliphatics	85		87		40-140	2		25
C11-C22 Aromatics	76		80		40-140	5		25
Naphthalene	62		62		40-140	0		25
2-Methylnaphthalene	67		68		40-140	1		25
Acenaphthylene	61		62		40-140	2		25
Acenaphthene	68		72		40-140	6		25
Fluorene	72		75		40-140	4		25
Phenanthrene	78		80		40-140	3		25
Anthracene	81		84		40-140	4		25
Fluoranthene	80		84		40-140	5		25
Pyrene	82		86		40-140	5		25
Benzo(a)anthracene	77		80		40-140	4		25
Chrysene	82		86		40-140	5		25
Benzo(b)fluoranthene	80		83		40-140	4		25
Benzo(k)fluoranthene	76		80		40-140	5		25
Benzo(a)pyrene	77		78		40-140	1		25
Indeno(1,2,3-cd)Pyrene	64		67		40-140	5		25
Dibenzo(a,h)anthracene	76		77		40-140	1		25
Benzo(ghi)perylene	77		81		40-140	5		25
Nonane (C9)	50		50		30-140	0		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL

Project Number: 0139-107911

Lab Number: L1503035

Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG763567-2 WG763567-3								
Decane (C10)	58		57		40-140	2		25
Dodecane (C12)	63		62		40-140	2		25
Tetradecane (C14)	67		68		40-140	1		25
Hexadecane (C16)	77		76		40-140	1		25
Octadecane (C18)	83		83		40-140	0		25
Nonadecane (C19)	84		86		40-140	2		25
Eicosane (C20)	84		86		40-140	2		25
Docosane (C22)	86		88		40-140	2		25
Tetracosane (C24)	82		85		40-140	4		25
Hexacosane (C26)	87		89		40-140	2		25
Octacosane (C28)	86		89		40-140	3		25
Triacontane (C30)	88		90		40-140	2		25
Hexatriacontane (C36)	88		91		40-140	3		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	70		73		40-140
o-Terphenyl	71		73		40-140
2-Fluorobiphenyl	69		70		40-140
2-Bromonaphthalene	71		73		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

PCBS

Project Name: KING OPEN SCHOOL | **Lab Number:** L1503035
Project Number: 0139-107911 | **Report Date:** 02/25/15

SAMPLE RESULTS

Lab ID:	L1503035-01	Date Collected:	02/18/15 10:40
Client ID:	CDM-6 1'-4'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/19/15 10:39
Analytical Date:	02/20/15 14:09	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	02/19/15
Percent Solids:	91%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/19/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.1	--	1	A
Aroclor 1221	ND		ug/kg	36.1	--	1	A
Aroclor 1232	ND		ug/kg	36.1	--	1	A
Aroclor 1242	ND		ug/kg	36.1	--	1	A
Aroclor 1248	ND		ug/kg	36.1	--	1	A
Aroclor 1254	ND		ug/kg	36.1	--	1	A
Aroclor 1260	ND		ug/kg	36.1	--	1	A
Aroclor 1262	ND		ug/kg	36.1	--	1	A
Aroclor 1268	ND		ug/kg	36.1	--	1	A
PCBs, Total	ND		ug/kg	36.1	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	52		30-150	A
Decachlorobiphenyl	47		30-150	A
2,4,5,6-Tetrachloro-m-xylene	57		30-150	B
Decachlorobiphenyl	60		30-150	B

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503035
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503035-02	Date Collected:	02/18/15 11:15
Client ID:	CDM-6 4'-8'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil	Extraction Method:	EPA 3546
Analytical Method:	97,8082	Extraction Date:	02/19/15 10:39
Analytical Date:	02/20/15 14:42	Cleanup Method:	EPA 3665A
Analyst:	JW	Cleanup Date:	02/19/15
Percent Solids:	86%	Cleanup Method:	EPA 3660B
		Cleanup Date:	02/19/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	38.4	--	1	A
Aroclor 1221	ND		ug/kg	38.4	--	1	A
Aroclor 1232	ND		ug/kg	38.4	--	1	A
Aroclor 1242	ND		ug/kg	38.4	--	1	A
Aroclor 1248	ND		ug/kg	38.4	--	1	A
Aroclor 1254	ND		ug/kg	38.4	--	1	A
Aroclor 1260	ND		ug/kg	38.4	--	1	A
Aroclor 1262	ND		ug/kg	38.4	--	1	A
Aroclor 1268	ND		ug/kg	38.4	--	1	A
PCBs, Total	ND		ug/kg	38.4	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	69		30-150	A
Decachlorobiphenyl	58		30-150	A
2,4,5,6-Tetrachloro-m-xylene	75		30-150	B
Decachlorobiphenyl	72		30-150	B

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 02/20/15 10:29
Analyst: JW

Extraction Method: EPA 3546
Extraction Date: 02/19/15 10:39
Cleanup Method: EPA 3665A
Cleanup Date: 02/19/15
Cleanup Method: EPA 3660B
Cleanup Date: 02/19/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-02 Batch: WG763618-1						
Aroclor 1016	ND		ug/kg	31.5	--	A
Aroclor 1221	ND		ug/kg	31.5	--	A
Aroclor 1232	ND		ug/kg	31.5	--	A
Aroclor 1242	ND		ug/kg	31.5	--	A
Aroclor 1248	ND		ug/kg	31.5	--	A
Aroclor 1254	ND		ug/kg	31.5	--	A
Aroclor 1260	ND		ug/kg	31.5	--	A
Aroclor 1262	ND		ug/kg	31.5	--	A
Aroclor 1268	ND		ug/kg	31.5	--	A
PCBs, Total	ND		ug/kg	31.5	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	38		30-150	A
Decachlorobiphenyl	38		30-150	A
2,4,5,6-Tetrachloro-m-xylene	39		30-150	B
Decachlorobiphenyl	44		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL

Project Number: 0139-107911

Lab Number: L1503035

Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-02 Batch: WG763618-2 WG763618-3									
Aroclor 1016	104		96		40-140	8		30	A
Aroclor 1260	101		93		40-140	8		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	83		82		30-150	A
Decachlorobiphenyl	82		103		30-150	A
2,4,5,6-Tetrachloro-m-xylene	85		83		30-150	B
Decachlorobiphenyl	95		94		30-150	B

METALS

Project Name: KING OPEN SCHOOL
Lab Number: L1503035
Project Number: 0139-107911
Report Date: 02/25/15

SAMPLE RESULTS

Lab ID: L1503035-01
Date Collected: 02/18/15 10:40
Client ID: CDM-6 1'-4'
Date Received: 02/18/15
Sample Location: CAMBRIDGE, MA
Field Prep: Not Specified
Matrix: Soil
Percent Solids: 91%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	1.8		mg/kg	0.42	--	1	02/19/15 10:37	02/19/15 16:28	EPA 3050B	97,6010C	TT
Barium, Total	20		mg/kg	0.42	--	1	02/19/15 10:37	02/19/15 16:28	EPA 3050B	97,6010C	TT
Cadmium, Total	ND		mg/kg	0.42	--	1	02/19/15 10:37	02/19/15 16:28	EPA 3050B	97,6010C	TT
Chromium, Total	24		mg/kg	0.42	--	1	02/19/15 10:37	02/19/15 16:28	EPA 3050B	97,6010C	TT
Lead, Total	4.1		mg/kg	2.1	--	1	02/19/15 10:37	02/19/15 16:28	EPA 3050B	97,6010C	TT
Mercury, Total	ND		mg/kg	0.077	--	1	02/20/15 05:01	02/20/15 11:45	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.1	--	1	02/19/15 10:37	02/19/15 16:28	EPA 3050B	97,6010C	TT
Silver, Total	ND		mg/kg	0.42	--	1	02/19/15 10:37	02/19/15 16:28	EPA 3050B	97,6010C	TT

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1503035
Project Number:	0139-107911	**Report Date:**	02/25/15

SAMPLE RESULTS

Lab ID:	L1503035-02	Date Collected:	02/18/15 11:15
Client ID:	CDM-6 4'-8'	Date Received:	02/18/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Not Specified
Matrix:	Soil		
Percent Solids:	86%		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Westborough Lab											
Arsenic, Total	4.8		mg/kg	0.45	--	1	02/19/15 10:37	02/19/15 16:32	EPA 3050B	97,6010C	TT
Barium, Total	74		mg/kg	0.45	--	1	02/19/15 10:37	02/19/15 16:32	EPA 3050B	97,6010C	TT
Cadmium, Total	ND		mg/kg	0.45	--	1	02/19/15 10:37	02/19/15 16:32	EPA 3050B	97,6010C	TT
Chromium, Total	13		mg/kg	0.45	--	1	02/19/15 10:37	02/19/15 16:32	EPA 3050B	97,6010C	TT
Lead, Total	340		mg/kg	2.2	--	1	02/19/15 10:37	02/19/15 16:32	EPA 3050B	97,6010C	TT
Mercury, Total	0.246		mg/kg	0.074	--	1	02/20/15 05:01	02/20/15 11:47	EPA 7471B	97,7471B	MC
Selenium, Total	ND		mg/kg	2.2	--	1	02/19/15 10:37	02/19/15 16:32	EPA 3050B	97,6010C	TT
Silver, Total	ND		mg/kg	0.45	--	1	02/19/15 10:37	02/19/15 16:32	EPA 3050B	97,6010C	TT

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035
Project Number: 0139-107911 **Report Date:** 02/25/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG763602-1										
Arsenic, Total	ND		mg/kg	0.40	--	1	02/19/15 10:37	02/19/15 16:17	97,6010C	TT
Barium, Total	ND		mg/kg	0.40	--	1	02/19/15 10:37	02/19/15 16:17	97,6010C	TT
Cadmium, Total	ND		mg/kg	0.40	--	1	02/19/15 10:37	02/19/15 16:17	97,6010C	TT
Chromium, Total	ND		mg/kg	0.40	--	1	02/19/15 10:37	02/19/15 16:17	97,6010C	TT
Lead, Total	ND		mg/kg	2.0	--	1	02/19/15 10:37	02/19/15 16:17	97,6010C	TT
Selenium, Total	ND		mg/kg	2.0	--	1	02/19/15 10:37	02/19/15 16:17	97,6010C	TT
Silver, Total	ND		mg/kg	0.40	--	1	02/19/15 10:37	02/19/15 16:17	97,6010C	TT

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Westborough Lab for sample(s): 01-02 Batch: WG763763-1										
Mercury, Total	ND		mg/kg	0.083	--	1	02/20/15 05:01	02/20/15 11:39	97,7471B	MC

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG763602-2 WG763602-3 SRM Lot Number: D083-540								
Arsenic, Total	106		98		78-122	8		30
Barium, Total	90		90		82-117	0		30
Cadmium, Total	96		93		82-118	3		30
Chromium, Total	95		95		79-121	0		30
Lead, Total	90		91		81-119	1		30
Selenium, Total	102		102		78-123	0		30
Silver, Total	102		99		74-125	3		30
MCP Total Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG763763-2 WG763763-3 SRM Lot Number: D083-540								
Mercury, Total	114		114		75-126	0		30

INORGANICS
&
MISCELLANEOUS

Project Name: KING OPEN SCHOOL
Lab Number: L1503035
Project Number: 0139-107911
Report Date: 02/25/15

SAMPLE RESULTS

Lab ID: L1503035-01
Client ID: CDM-6 1'-4'
Sample Location: CAMBRIDGE, MA
Matrix: Soil

Date Collected: 02/18/15 10:40
Date Received: 02/18/15
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	91.1		%	0.100	NA	1	-	02/18/15 23:59	30,2540G	RT

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503035
Report Date: 02/25/15

SAMPLE RESULTS

Lab ID: L1503035-02
Client ID: CDM-6 4'-8'
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Date Collected: 02/18/15 11:15
Date Received: 02/18/15
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	85.6		%	0.100	NA	1	-	02/18/15 23:59	30,2540G	RT

Lab Duplicate Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503035
Report Date: 02/25/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-02 QC Batch ID: WG763519-1 QC Sample: L1503012-01 Client ID: DUP Sample						
Solids, Total	86.2	86.4	%	0		20

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: 02/18/2015 21:23

Cooler Information Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503035-01A	Vial MeOH preserved	A	N/A	2.9	Y	Absent	MCP-8260HLW-10(14)
L1503035-01B	Vial water preserved	A	N/A	2.9	Y	Absent	MCP-8260HLW-10(14)
L1503035-01C	Vial water preserved	A	N/A	2.9	Y	Absent	MCP-8260HLW-10(14)
L1503035-01D	Glass 120ml/4oz unpreserved	A	N/A	2.9	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP(),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1503035-01E	Glass 250ml/8oz unpreserved	A	N/A	2.9	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP(),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L1503035-02A	Vial MeOH preserved	A	N/A	2.9	Y	Absent	MCP-8260HLW-10(14)
L1503035-02B	Vial water preserved	A	N/A	2.9	Y	Absent	MCP-8260HLW-10(14)
L1503035-02C	Vial water preserved	A	N/A	2.9	Y	Absent	MCP-8260HLW-10(14)
L1503035-02D	Glass 120ml/4oz unpreserved	A	N/A	2.9	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503035
Report Date: 02/25/15

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503035-02E	Glass 250ml/8oz unpreserved	A	N/A	2.9	Y	Absent	EPH-10(14),MCP-8082-10(365),MCP-CR-6010T-10(180),MCP-8270-10(14),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),TS(7),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)

558

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL	- Estimated 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 EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
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

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

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 ten times (10x) 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. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

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.

Project Name: KING OPEN SCHOOL **Lab Number:** L1503035
Project Number: 0139-107911 **Report Date:** 02/25/15

Data Qualifiers

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 lower value for the two columns 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.

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.

S - Analytical results are from modified screening analysis.

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

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

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.

98 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, 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.

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: 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
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

Revised COC - MMM 2/19/15

Serial_No:02251511:22

ALPHA ANALYTICAL

8 Walkup Drive Westboro, MA 01581 Tel: 508-898-9220

320 Forbes Blvd Mansfield, MA 02048 Tel: 508-822-9300

CHAIN OF CUSTODY

PAGE ____ OF ____

Date Rec'd in Lab: 2-18-15

ALPHA Job #: L1503035

Client Information

Client: CDM Smith

Address: 50 Hampshire St Cambridge, MA 02139

Phone: 617 452 6419

Email: wroee@cdmsmith.com

Additional Project Information:

Project Information

Project Name: King Open School

Project Location: Cambridge, MA

Project #: 0139-107911

Project Manager: Jay McMillian

ALPHA Quote #:

Turn-Around Time

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

Date Due: 2-25-15

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

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 ____ Criteria ____

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; ☐ PEST ☒ PCB; 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	VOC	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	Sample Comments	TOTAL # BOTTLES
03035-01	CDM-6 1'-4'	2/18/15	10:40	S	EW	X	X		X	X		X			5
02	CDM-6 4'-8'	2/18/15	11:15	S	EW	X	X		X	X		X			5
Container Type						V	V		A	A		A			
Preservative						A	F		A	A		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
Elizabeth [signature]	2/18/15 1330	[signature] AL	2/18/15 1330
[signature]	2/18/15 1835	[signature]	2-18-15 1835

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 ____ OF ____

Date Rec'd in Lab: 2-18-15

ALPHA Job #: L1503035

ALPHA ANALYTICAL

8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220

320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: CDM Smith

Address: 50 Hampshire St, Cambridge, MA 02139

Phone: 617 452 6419

Email: wroee@cdmsmith.com

Additional Project Information:

Project Information

Project Name: King Open School

Project Location: Cambridge, MA

Project #: 0139-107911

Project Manager: Jay McMillian

ALPHA Quote #:

Turn-Around Time

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

Date Due: 2-25-15

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

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 ____ Criteria ____

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

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	VOC	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	Sample Comments	TOTAL # BOTTLES
03035-01	CDM-6 1'-4'	2/18/15		S	EW	X	X		X	X		X			5
02	CDM-6 4'-8'	2/18/15		S	EW	X	X		X	X		X			5
Container Type						V	V		A	A		A			
Preservative						A	F		A	A		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
Elizabeth [signature]	2/18/15 1330	[signature] AZ	2/18/15 1330
[signature]	2/18/15 1835	[signature]	2-18-15 1835

FORM NO: 01-01 (rev. 12-Mar-2012)

7A
Volatile Organics CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503035

Instrument ID: Voa104.i   Calibration Date: 20-FEB-2015 Time: 08:10

Lab File ID: 0220A01   Init. Calib. Date(s): 14-NOV-2 14-NOV-2

Sample No: 8260 CCAL   Init. Calib. Times : 18:34 21:39

Compound	$\overline{RRF}$	RRF	MIN RRF	%D	MAX %D	
dichlorodifluoromethane	.16305	.09466	.1	-42	20	F
chloromethane	.31614	.20486	.1	-35	20	F
vinyl chloride	.2743	.19973	.1	-27	20	F
bromomethane	100	68.743	.1	-31	20	F
chloroethane	.13774	.12193	.1	-11	20	
trichlorofluoromethane	.27387	.24887	.1	-9	20	
ethyl ether	.09232	.09092	.05	-2	20	
1,1,-dichloroethene	.2177	.17505	.1	-20	20	
carbon disulfide	.70085	.52139	.1	-26	20	F
methylene chloride	.26137	.24239	.1	-7	20	
acetone	100	114	.1	14	20	
trans-1,2-dichloroethene	.25442	.24434	.1	-4	20	
methyl tert butyl ether	.55986	.54434	.1	-3	20	
Diisopropyl Ether	.94156	1.0044	.05	7	20	
1,1-dichloroethane	.49595	.49292	.2	-1	20	
Ethyl-Tert-Butyl-Ether	.82014	.84191	.05	3	20	
cis-1,2-dichloroethene	.28074	.28432	.1	1	20	
2,2-dichloropropane	.35677	.3732	.05	5	20	
bromochloromethane	.12861	.12766	.05	-1	20	
chloroform	.44837	.46796	.2	4	20	
carbontetrachloride	.32832	.34951	.1	6	20	
tetrahydrofuran	.06814	.0704	.05	3	20	
1,1,1-trichloroethane	.37681	.39805	.1	6	20	
2-butanone	.09192	.09414	.1	2	20	F
1,1-dichloropropene	.33481	.35596	.05	6	20	
benzene	.97656	1.0066	.5	3	20	
Tertiary-Amyl Methyl Ether	.62875	.64872	.05	3	20	
1,2-dichloroethane	.30244	.30352	.1	0	20	
trichloroethene	.264	.28805	.2	9	20	
dibromomethane	.14205	.14539	.05	2	20	
1,2-dichloropropane	.27957	.30626	.1	10	20	
bromodichloromethane	.33098	.37071	.2	12	20	
1,4-dioxane	.00202	.00198	.05	-2	20	F
cis-1,3-dichloropropene	.39239	.43824	.2	12	20	
toluene	.87644	.8959	.4	2	20	
tetrachloroethene	.36363	.39585	.2	9	20	
4-methyl-2-pentanone	.07517	.08483	.1	13	20	F
trans-1,3-dichloropropene	.46349	.47923	.1	3	20	

FORM VII MCP-8260HLW-10

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7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1503035

Instrument ID: Voa104.i Calibration Date: 20-FEB-2015 Time: 08:10

Lab File ID: 0220A01 Init. Calib. Date(s): 14-NOV-2 14-NOV-2

Sample No: 8260 CCAL Init. Calib. Times : 18:34 21:39

Compound	$\overline{RRF}$	RRF	MIN RRF	%D	MAX %D	
1,1,2-trichloroethane	.23224	.24053	.1	4	20	
chlorodibromomethane	.34856	.36109	.1	4	20	
1,3-dichloropropane	.45928	.46764	.05	2	20	
1,2-dibromoethane	.28223	.27789	.1	-2	20	
2-hexanone	.19278	.19595	.1	2	20	
chlorobenzene	1.0010	1.0496	.5	5	20	
ethyl benzene	1.6393	1.8364	.1	12	20	
1,1,1,2-tetrachloroethane	.3581	.38217	.05	7	20	
p/m xylene	.63448	.71085	.1	12	20	
o xylene	.6125	.67588	.3	10	20	
styrene	1.0136	1.1167	.3	10	20	
bromoform	.39846	.39799	.1	0	20	
isopropylbenzene	3.1932	3.5301	.1	11	20	
bromobenzene	.84329	.85816	.05	2	20	
n-propylbenzene	3.6352	4.1376	.05	14	20	
1,1,2,2,-tetrachloroethane	.67812	.68136	.3	0	20	
2-chlorotoluene	2.3296	2.4737	.05	6	20	
1,2,3-trichloropropane	.49557	.49647	.05	0	20	
1,3,5-trimethybenzene	2.6303	2.9237	.05	11	20	
4-chorotoluene	2.2427	2.4558	.05	10	20	
tert-butylbenzene	2.2838	2.5261	.05	11	20	
1,2,4-trimethylbenzene	2.6527	2.9224	.05	10	20	
sec-butylbenzene	3.4242	3.8985	.05	14	20	
p-isopropyltoluene	2.8275	3.2771	.05	16	20	
1,3-dichlorobenzene	1.5651	1.6736	.6	7	20	
1,4-dichlorobenzene	1.6000	1.6879	.5	5	20	
n-butylbenzene	2.4383	2.9593	.05	21	20	F
1,2-dichlorobenzene	1.4443	1.5102	.4	5	20	
1,2-dibromo-3-chloropropane	.10573	.10133	.05	-4	20	
hexachlorobutadiene	.45607	.51782	.05	14	20	
1,2,4-trichlorobenzene	.95262	1.0421	.2	9	20	
naphthalene	2.1836	2.0719	.05	-5	20	
1,2,3-trichlorobenzene	.88772	.91369	.05	3	20	
dibromofluoromethane	.2538	.25634	.05	1	30	
1,2-dichloroethane-d4	.22706	.22335	.05	-2	30	
toluene-d8	1.3076	1.2743	.05	-3	30	
4-bromofluorobenzene	.90729	.92283	.05	2	30	

FORM VII MCP-8260HLW-10

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ANALYTICAL REPORT

Lab Number:	L1503209
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Jay McMullen
Phone:	(617) 452-6303
Project Name:	KING OPEN SCHOOL
Project Number:	0139-107911
Report Date:	03/03/15

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

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

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503209
Report Date: 03/03/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1503209-01	CDM-6 4'-8'	SOIL	CAMBRIDGE, MA	02/18/15 11:15	02/18/15

Project Name: KING OPEN SCHOOL **Lab Number:** L1503209
Project Number: 0139-107911 **Report Date:** 03/03/15

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: KING OPEN SCHOOL **Lab Number:** L1503209
Project Number: 0139-107911 **Report Date:** 03/03/15

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. All specific QC 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. 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 (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar 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. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503209
Report Date: 03/03/15

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: 03/03/15

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METALS

Project Name: KING OPEN SCHOOL
Lab Number: L1503209
Project Number: 0139-107911
Report Date: 03/03/15

SAMPLE RESULTS

Lab ID: L1503209-01
Date Collected: 02/18/15 11:15
Client ID: CDM-6 4'-8'
Date Received: 02/18/15
Sample Location: CAMBRIDGE, MA
Field Prep: Not Specified
Matrix: Soil
TCLP/SPLP Ext. Date: 02/26/15 16:03

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab											
Lead, TCLP	ND		mg/l	0.50	--	1	02/28/15 10:20	03/02/15 14:47	EPA 3015	1,6010C	JH

Project Name: KING OPEN SCHOOL **Lab Number:** L1503209
Project Number: 0139-107911 **Report Date:** 03/03/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
TCLP Metals by EPA 1311 - Westborough Lab for sample(s): 01 Batch: WG765361-1										
Lead, TCLP	ND		mg/l	0.50	--	1	02/28/15 10:20	03/02/15 13:18	1,6010C	JH

Prep Information

Digestion Method: EPA 3015
TCLP/SPLP Extraction Date: 02/26/15 16:03

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911
Lab Number: L1503209
Report Date: 03/03/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 Batch: WG765361-2								
Lead, TCLP	98		-		75-125	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503209
Report Date: 03/03/15

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG765361-4 QC Sample: L1503539-01 Client ID: MS Sample												
Lead, TCLP	ND	5.1	4.8	94		-	-		75-125	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503209
Report Date: 03/03/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG765361-3 QC Sample: L1503539-01 Client ID: DUP Sample						
Lead, TCLP	ND	ND	mg/l	NC		20

Project Name: KING OPEN SCHOOL
Project Number: 0139-107911

Lab Number: L1503209
Report Date: 03/03/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1503209-01A	Glass 250ml/8oz unpreserved	A	N/A	2.9	Y	Absent	-
L1503209-01X	Plastic 120ml HNO3 preserved spl	A	<2	2.9	Y	Absent	PB-CI(180)
L1503209-01X9	Tumble Vessel	A	N/A	2.9	Y	Absent	-

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL - Estimated 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 EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

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

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

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 ten times (10x) 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. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

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.

Report Format: Data Usability Report

Project Name:	KING OPEN SCHOOL	Lab Number:	L1503209
Project Number:	0139-107911	Report Date:	03/03/15

Data Qualifiers

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 lower value for the two columns 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.

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.

S - Analytical results are from modified screening analysis.

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

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

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

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.

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: 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
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

Revised COC - MMM 2/19/15

Serial_No:03031514:26

CHAIN OF CUSTODY

PAGE ____ OF ____

ALPHA ANALYTICAL

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: 2-18-15

ALPHA Job #: L1503209 LT 02/25/15

Client Information

Client: CDM Smith

Address: 50 Hampshire St, Cambridge, MA 02139

Phone: 617 452 6419

Email: wrose@cdmsmith.com

Additional Project Information:

Project Information

Project Name: King Open School

Project Location: Cambridge, MA

Project #: 0139-107911

Project Manager: Jay McMillian

ALPHA Quote #:

Turn-Around Time

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

Date Due: 03/04/15

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

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 ____ Criteria ____

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 | TCLP-PB

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	VOC	SVOC	METALS	METALS	EPH	VPH	PCB	TPH	TCLP-PB	Sample Comments	TOTAL # BOTTLES
03209	CDM-6 1'-4'	2/18/15	10:40	S	EW	~~X~~	~~X~~		~~X~~	~~X~~		~~X~~				5
-01	CDM-6 4'-8'	2/18/15	11:15	S	EW	~~X~~	~~X~~		~~X~~	~~X~~		~~X~~		X		5

	VOC	SVOC	METALS	METALS	EPH	VPH	PCB
Container Type	V	V		A	A		A
Preservative	A	F		A	A		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
Elizabeth Wren	2/18/15 1330	[signature]	2/18/15 1330
[signature]	2/18/15 1835	AL Curry	2-18-15 1835

FORM NO: 01-01 (rev. 12-Mar-2012)

ANALYTICAL REPORT

Lab Number:	L1505306
Client:	CDM Smith, Inc. 75 State Street Suite 701 Boston, MA 02109
ATTN:	Jay McMullen
Phone:	(617) 452-6303
Project Name:	KING OPEN SCHOOL
Project Number:	107911.ENV
Report Date:	03/27/15

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), VA (460195), MD (348), IL (200077), NC (666), TX (T104704476), DOD (L2217), USDA (Permit #P-330-11-00240).

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

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV

Lab Number: L1505306
Report Date: 03/27/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1505306-01	CDM-2	WATER	CAMBRIDGE, MA	03/19/15 07:55	03/19/15
L1505306-02	CDM-3	WATER	CAMBRIDGE, MA	03/19/15 09:45	03/19/15

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

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).	YES
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)?	NO

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: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

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. All specific QC 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. 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 (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar 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. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

Case Narrative (continued)

MCP Related Narratives

Volatile Organics

In reference to question H:

The initial calibration, associated with L1505306-01 and -02, did not meet the method required minimum response factor on the lowest calibration standard for 1,4-dioxane (0.00133), as well as the average response factor for 4-methyl-2-pentanone and 1,4-dioxane. The initial calibration verification is outside acceptance criteria for dichlorodifluoromethane (143%), but within overall method criteria.

The continuing calibration standard, associated with L1505306-01 and -02, is outside the acceptance criteria for several compounds; however, it is within overall method allowances. A copy of the continuing calibration standard is included as an addendum to this report.

EPH

In reference to question I:

All samples were analyzed for a subset of MCP compounds per the Chain of Custody.

Dissolved Metals

In reference to question H:

The WG770384-2/-3 LCS/LCSD RPD, associated with L1505306-01 and -02, is above the acceptance criteria for selenium (22%).

In reference to question I:

All samples were analyzed for a subset of MCP elements per the Chain of Custody.

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: 03/27/15

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ORGANICS

VOLATILES

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306

Project Number: 107911.ENV **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID: L1505306-01
Client ID: CDM-2
Sample Location: CAMBRIDGE, MA

Date Collected: 03/19/15 07:55
Date Received: 03/19/15
Field Prep: Field Filtered (Metals)

Matrix: Water
Analytical Method: 97,8260C
Analytical Date: 03/24/15 13:43
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics - Westborough Lab						
Methylene chloride	ND		ug/l	2.0	--	1
1,1-Dichloroethane	ND		ug/l	1.0	--	1
Chloroform	ND		ug/l	1.0	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,2-Dichloropropane	ND		ug/l	1.0	--	1
Dibromochloromethane	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.0	--	1
Tetrachloroethene	ND		ug/l	1.0	--	1
Chlorobenzene	ND		ug/l	1.0	--	1
Trichlorofluoromethane	ND		ug/l	2.0	--	1
1,2-Dichloroethane	ND		ug/l	1.0	--	1
1,1,1-Trichloroethane	ND		ug/l	1.0	--	1
Bromodichloromethane	ND		ug/l	1.0	--	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	--	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	--	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	--	1
1,1-Dichloropropene	ND		ug/l	2.0	--	1
Bromoform	ND		ug/l	2.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Benzene	ND		ug/l	0.50	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Chloromethane	ND		ug/l	2.0	--	1
Bromomethane	ND		ug/l	2.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	2.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
trans-1,2-Dichloroethene	ND		ug/l	1.0	--	1
Trichloroethene	ND		ug/l	1.0	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306

Project Number: 107911.ENV **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-01	Date Collected:	03/19/15 07:55
Client ID:	CDM-2	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics - Westborough Lab						
1,2-Dichlorobenzene	ND		ug/l	1.0	--	1
1,3-Dichlorobenzene	ND		ug/l	1.0	--	1
1,4-Dichlorobenzene	ND		ug/l	1.0	--	1
Methyl tert butyl ether	ND		ug/l	2.0	--	1
p/m-Xylene	ND		ug/l	2.0	--	1
o-Xylene	ND		ug/l	1.0	--	1
Xylene (Total)	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1
1,2-Dichloroethene (total)	ND		ug/l	1.0	--	1
Dibromomethane	ND		ug/l	2.0	--	1
1,2,3-Trichloropropane	ND		ug/l	2.0	--	1
Styrene	ND		ug/l	1.0	--	1
Dichlorodifluoromethane	ND		ug/l	2.0	--	1
Acetone	ND		ug/l	5.0	--	1
Carbon disulfide	ND		ug/l	2.0	--	1
2-Butanone	ND		ug/l	5.0	--	1
4-Methyl-2-pentanone	ND		ug/l	5.0	--	1
2-Hexanone	ND		ug/l	5.0	--	1
Bromochloromethane	ND		ug/l	2.0	--	1
Tetrahydrofuran	ND		ug/l	2.0	--	1
2,2-Dichloropropane	ND		ug/l	2.0	--	1
1,2-Dibromoethane	ND		ug/l	2.0	--	1
1,3-Dichloropropane	ND		ug/l	2.0	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Bromobenzene	ND		ug/l	2.0	--	1
n-Butylbenzene	ND		ug/l	2.0	--	1
sec-Butylbenzene	ND		ug/l	2.0	--	1
tert-Butylbenzene	ND		ug/l	2.0	--	1
o-Chlorotoluene	ND		ug/l	2.0	--	1
p-Chlorotoluene	ND		ug/l	2.0	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.0	--	1
Hexachlorobutadiene	ND		ug/l	0.60	--	1
Isopropylbenzene	ND		ug/l	2.0	--	1
p-Isopropyltoluene	ND		ug/l	2.0	--	1
Naphthalene	ND		ug/l	2.0	--	1
n-Propylbenzene	ND		ug/l	2.0	--	1
1,2,3-Trichlorobenzene	ND		ug/l	2.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	2.0	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306

Project Number: 107911.ENV **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-01	Date Collected:	03/19/15 07:55
Client ID:	CDM-2	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics - Westborough Lab						
1,3,5-Trimethylbenzene	ND		ug/l	2.0	--	1
1,2,4-Trimethylbenzene	ND		ug/l	2.0	--	1
Ethyl ether	ND		ug/l	2.0	--	1
Isopropyl Ether	ND		ug/l	2.0	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/l	2.0	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--	1
1,4-Dioxane	ND		ug/l	250	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	107		70-130

Project Name: KING OPEN SCHOOL

Lab Number: L1505306

Project Number: 107911.ENV

Report Date: 03/27/15

SAMPLE RESULTS

Lab ID: L1505306-02
Client ID: CDM-3
Sample Location: CAMBRIDGE, MA

Date Collected: 03/19/15 09:45
Date Received: 03/19/15
Field Prep: Field Filtered (Metals)

Matrix: Water
Analytical Method: 97,8260C
Analytical Date: 03/24/15 14:15
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics - Westborough Lab						
Methylene chloride	ND		ug/l	2.0	--	1
1,1-Dichloroethane	ND		ug/l	1.0	--	1
Chloroform	ND		ug/l	1.0	--	1
Carbon tetrachloride	ND		ug/l	1.0	--	1
1,2-Dichloropropane	ND		ug/l	1.0	--	1
Dibromochloromethane	ND		ug/l	1.0	--	1
1,1,2-Trichloroethane	ND		ug/l	1.0	--	1
Tetrachloroethene	ND		ug/l	1.0	--	1
Chlorobenzene	ND		ug/l	1.0	--	1
Trichlorofluoromethane	ND		ug/l	2.0	--	1
1,2-Dichloroethane	ND		ug/l	1.0	--	1
1,1,1-Trichloroethane	ND		ug/l	1.0	--	1
Bromodichloromethane	ND		ug/l	1.0	--	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	--	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	--	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	--	1
1,1-Dichloropropene	ND		ug/l	2.0	--	1
Bromoform	ND		ug/l	2.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Benzene	ND		ug/l	0.50	--	1
Toluene	ND		ug/l	1.0	--	1
Ethylbenzene	ND		ug/l	1.0	--	1
Chloromethane	ND		ug/l	2.0	--	1
Bromomethane	ND		ug/l	2.0	--	1
Vinyl chloride	ND		ug/l	1.0	--	1
Chloroethane	ND		ug/l	2.0	--	1
1,1-Dichloroethene	ND		ug/l	1.0	--	1
trans-1,2-Dichloroethene	ND		ug/l	1.0	--	1
Trichloroethene	ND		ug/l	1.0	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306

Project Number: 107911.ENV **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID: L1505306-02 Date Collected: 03/19/15 09:45
Client ID: CDM-3 Date Received: 03/19/15
Sample Location: CAMBRIDGE, MA Field Prep: Field Filtered (Metals)

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics - Westborough Lab						
1,2-Dichlorobenzene	ND		ug/l	1.0	--	1
1,3-Dichlorobenzene	ND		ug/l	1.0	--	1
1,4-Dichlorobenzene	ND		ug/l	1.0	--	1
Methyl tert butyl ether	ND		ug/l	2.0	--	1
p/m-Xylene	ND		ug/l	2.0	--	1
o-Xylene	ND		ug/l	1.0	--	1
Xylene (Total)	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	1.0	--	1
1,2-Dichloroethene (total)	ND		ug/l	1.0	--	1
Dibromomethane	ND		ug/l	2.0	--	1
1,2,3-Trichloropropane	ND		ug/l	2.0	--	1
Styrene	ND		ug/l	1.0	--	1
Dichlorodifluoromethane	ND		ug/l	2.0	--	1
Acetone	36		ug/l	5.0	--	1
Carbon disulfide	ND		ug/l	2.0	--	1
2-Butanone	ND		ug/l	5.0	--	1
4-Methyl-2-pentanone	ND		ug/l	5.0	--	1
2-Hexanone	ND		ug/l	5.0	--	1
Bromochloromethane	ND		ug/l	2.0	--	1
Tetrahydrofuran	ND		ug/l	2.0	--	1
2,2-Dichloropropane	ND		ug/l	2.0	--	1
1,2-Dibromoethane	ND		ug/l	2.0	--	1
1,3-Dichloropropane	ND		ug/l	2.0	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	1.0	--	1
Bromobenzene	ND		ug/l	2.0	--	1
n-Butylbenzene	ND		ug/l	2.0	--	1
sec-Butylbenzene	ND		ug/l	2.0	--	1
tert-Butylbenzene	ND		ug/l	2.0	--	1
o-Chlorotoluene	ND		ug/l	2.0	--	1
p-Chlorotoluene	ND		ug/l	2.0	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.0	--	1
Hexachlorobutadiene	ND		ug/l	0.60	--	1
Isopropylbenzene	ND		ug/l	2.0	--	1
p-Isopropyltoluene	ND		ug/l	2.0	--	1
Naphthalene	ND		ug/l	2.0	--	1
n-Propylbenzene	ND		ug/l	2.0	--	1
1,2,3-Trichlorobenzene	ND		ug/l	2.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	2.0	--	1

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Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1505306
Project Number:	107911.ENV	**Report Date:**	03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-02	Date Collected:	03/19/15 09:45
Client ID:	CDM-3	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics - Westborough Lab						
1,3,5-Trimethylbenzene	ND		ug/l	2.0	--	1
1,2,4-Trimethylbenzene	ND		ug/l	2.0	--	1
Ethyl ether	ND		ug/l	2.0	--	1
Isopropyl Ether	ND		ug/l	2.0	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/l	2.0	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--	1
1,4-Dioxane	ND		ug/l	250	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	102		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	99		70-130
Dibromofluoromethane	108		70-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 03/24/15 06:22
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG770286-6					
Methylene chloride	ND		ug/l	2.0	--
1,1-Dichloroethane	ND		ug/l	1.0	--
Chloroform	ND		ug/l	1.0	--
Carbon tetrachloride	ND		ug/l	1.0	--
1,2-Dichloropropane	ND		ug/l	1.0	--
Dibromochloromethane	ND		ug/l	1.0	--
1,1,2-Trichloroethane	ND		ug/l	1.0	--
Tetrachloroethene	ND		ug/l	1.0	--
Chlorobenzene	ND		ug/l	1.0	--
Trichlorofluoromethane	ND		ug/l	2.0	--
1,2-Dichloroethane	ND		ug/l	1.0	--
1,1,1-Trichloroethane	ND		ug/l	1.0	--
Bromodichloromethane	ND		ug/l	1.0	--
trans-1,3-Dichloropropene	ND		ug/l	0.50	--
cis-1,3-Dichloropropene	ND		ug/l	0.50	--
1,3-Dichloropropene, Total	ND		ug/l	0.50	--
1,1-Dichloropropene	ND		ug/l	2.0	--
Bromoform	ND		ug/l	2.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	1.0	--
Benzene	ND		ug/l	0.50	--
Toluene	ND		ug/l	1.0	--
Ethylbenzene	ND		ug/l	1.0	--
Chloromethane	ND		ug/l	2.0	--
Bromomethane	ND		ug/l	2.0	--
Vinyl chloride	ND		ug/l	1.0	--
Chloroethane	ND		ug/l	2.0	--
1,1-Dichloroethene	ND		ug/l	1.0	--
trans-1,2-Dichloroethene	ND		ug/l	1.0	--
Trichloroethene	ND		ug/l	1.0	--

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1505306
Project Number:	107911.ENV	**Report Date:**	03/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 03/24/15 06:22
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG770286-6					
1,2-Dichlorobenzene	ND		ug/l	1.0	--
1,3-Dichlorobenzene	ND		ug/l	1.0	--
1,4-Dichlorobenzene	ND		ug/l	1.0	--
Methyl tert butyl ether	ND		ug/l	2.0	--
p/m-Xylene	ND		ug/l	2.0	--
o-Xylene	ND		ug/l	1.0	--
Xylene (Total)	ND		ug/l	1.0	--
cis-1,2-Dichloroethene	ND		ug/l	1.0	--
1,2-Dichloroethene (total)	ND		ug/l	1.0	--
Dibromomethane	ND		ug/l	2.0	--
1,2,3-Trichloropropane	ND		ug/l	2.0	--
Styrene	ND		ug/l	1.0	--
Dichlorodifluoromethane	ND		ug/l	2.0	--
Acetone	ND		ug/l	5.0	--
Carbon disulfide	ND		ug/l	2.0	--
2-Butanone	ND		ug/l	5.0	--
4-Methyl-2-pentanone	ND		ug/l	5.0	--
2-Hexanone	ND		ug/l	5.0	--
Bromochloromethane	ND		ug/l	2.0	--
Tetrahydrofuran	ND		ug/l	2.0	--
2,2-Dichloropropane	ND		ug/l	2.0	--
1,2-Dibromoethane	ND		ug/l	2.0	--
1,3-Dichloropropane	ND		ug/l	2.0	--
1,1,1,2-Tetrachloroethane	ND		ug/l	1.0	--
Bromobenzene	ND		ug/l	2.0	--
n-Butylbenzene	ND		ug/l	2.0	--
sec-Butylbenzene	ND		ug/l	2.0	--
tert-Butylbenzene	ND		ug/l	2.0	--
o-Chlorotoluene	ND		ug/l	2.0	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 03/24/15 06:22
Analyst: MM

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG770286-6					
p-Chlorotoluene	ND		ug/l	2.0	--
1,2-Dibromo-3-chloropropane	ND		ug/l	2.0	--
Hexachlorobutadiene	ND		ug/l	0.60	--
Isopropylbenzene	ND		ug/l	2.0	--
p-Isopropyltoluene	ND		ug/l	2.0	--
Naphthalene	ND		ug/l	2.0	--
n-Propylbenzene	ND		ug/l	2.0	--
1,2,3-Trichlorobenzene	ND		ug/l	2.0	--
1,2,4-Trichlorobenzene	ND		ug/l	2.0	--
1,3,5-Trimethylbenzene	ND		ug/l	2.0	--
1,2,4-Trimethylbenzene	ND		ug/l	2.0	--
Ethyl ether	ND		ug/l	2.0	--
Isopropyl Ether	ND		ug/l	2.0	--
Ethyl-Tert-Butyl-Ether	ND		ug/l	2.0	--
Tertiary-Amyl Methyl Ether	ND		ug/l	2.0	--
1,4-Dioxane	ND		ug/l	250	--
tert-Butyl Alcohol	ND		ug/l	10	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	97		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	105		70-130
Dibromofluoromethane	105		70-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV
Lab Number: L1505306
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG770286-4 WG770286-5								
Methylene chloride	119		118		70-130	1		20
1,1-Dichloroethane	111		112		70-130	1		20
Chloroform	117		118		70-130	1		20
Carbon tetrachloride	100		105		70-130	5		20
1,2-Dichloropropane	112		113		70-130	1		20
Dibromochloromethane	110		115		70-130	4		20
1,1,2-Trichloroethane	111		113		70-130	2		20
Tetrachloroethene	119		121		70-130	2		20
Chlorobenzene	119		121		70-130	2		20
Trichlorofluoromethane	113		114		70-130	1		20
1,2-Dichloroethane	118		117		70-130	1		20
1,1,1-Trichloroethane	103		106		70-130	3		20
Bromodichloromethane	112		114		70-130	2		20
trans-1,3-Dichloropropene	87		92		70-130	6		20
cis-1,3-Dichloropropene	97		99		70-130	2		20
1,1-Dichloropropene	112		113		70-130	1		20
Bromoform	106		109		70-130	3		20
1,1,2,2-Tetrachloroethane	110		111		70-130	1		20
Benzene	115		116		70-130	1		20
Toluene	114		117		70-130	3		20
Ethylbenzene	118		119		70-130	1		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV
Lab Number: L1505306
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG770286-4 WG770286-5								
Chloromethane	92		86		70-130	7		20
Bromomethane	112		110		70-130	2		20
Vinyl chloride	109		107		70-130	2		20
Chloroethane	115		112		70-130	3		20
1,1-Dichloroethene	114		116		70-130	2		20
trans-1,2-Dichloroethene	114		116		70-130	2		20
Trichloroethene	114		115		70-130	1		20
1,2-Dichlorobenzene	120		119		70-130	1		20
1,3-Dichlorobenzene	121		119		70-130	2		20
1,4-Dichlorobenzene	118		118		70-130	0		20
Methyl tert butyl ether	92		92		70-130	0		20
p/m-Xylene	120		122		70-130	2		20
o-Xylene	122		124		70-130	2		20
cis-1,2-Dichloroethene	117		116		70-130	1		20
Dibromomethane	122		119		70-130	2		20
1,2,3-Trichloropropane	108		110		70-130	2		20
Styrene	123		125		70-130	2		20
Dichlorodifluoromethane	117		118		70-130	1		20
Acetone	93		92		70-130	1		20
Carbon disulfide	101		103		70-130	2		20
2-Butanone	91		92		70-130	1		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV
Lab Number: L1505306
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG770286-4 WG770286-5								
4-Methyl-2-pentanone	96		97		70-130	1		20
2-Hexanone	89		91		70-130	2		20
Bromochloromethane	122		123		70-130	1		20
Tetrahydrofuran	98		99		70-130	1		20
2,2-Dichloropropane	77		79		70-130	3		20
1,2-Dibromoethane	107		111		70-130	4		20
1,3-Dichloropropane	111		114		70-130	3		20
1,1,1,2-Tetrachloroethane	109		113		70-130	4		20
Bromobenzene	117		118		70-130	1		20
n-Butylbenzene	110		108		70-130	2		20
sec-Butylbenzene	109		109		70-130	0		20
tert-Butylbenzene	113		114		70-130	1		20
o-Chlorotoluene	116		116		70-130	0		20
p-Chlorotoluene	116		116		70-130	0		20
1,2-Dibromo-3-chloropropane	85		85		70-130	0		20
Hexachlorobutadiene	114		114		70-130	0		20
Isopropylbenzene	116		117		70-130	1		20
p-Isopropyltoluene	113		113		70-130	0		20
Naphthalene	87		86		70-130	1		20
n-Propylbenzene	116		116		70-130	0		20
1,2,3-Trichlorobenzene	98		96		70-130	2		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1505306
Project Number: 107911.ENV
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG770286-4 WG770286-5								
1,2,4-Trichlorobenzene	100		100		70-130	0		20
1,3,5-Trimethylbenzene	119		119		70-130	0		20
1,2,4-Trimethylbenzene	118		118		70-130	0		20
Ethyl ether	117		116		70-130	1		20
Isopropyl Ether	99		100		70-130	1		20
Ethyl-Tert-Butyl-Ether	83		84		70-130	1		20
Tertiary-Amyl Methyl Ether	77		77		70-130	0		20
1,4-Dioxane	125		126		70-130	1		20
tert-Butyl Alcohol	74		73		70-130	1		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	95		97		70-130
Toluene-d8	99		101		70-130
4-Bromofluorobenzene	94		95		70-130
Dibromofluoromethane	106		105		70-130

SEMIVOLATILES

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV
Lab Number: L1505306
Report Date: 03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-01	Date Collected:	03/19/15 07:55
Client ID:	CDM-2	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	97,8270D	Extraction Date:	03/24/15 17:16
Analytical Date:	03/25/15 22:12		
Analyst:	RC		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/l	2.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Hexachlorobenzene	ND		ug/l	2.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
2-Chloronaphthalene	ND		ug/l	2.0	--	1
1,2-Dichlorobenzene	ND		ug/l	2.0	--	1
1,3-Dichlorobenzene	ND		ug/l	2.0	--	1
1,4-Dichlorobenzene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene	ND		ug/l	2.0	--	1
Fluoranthene	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorobutadiene	ND		ug/l	2.0	--	1
Hexachloroethane	ND		ug/l	2.0	--	1
Isophorone	ND		ug/l	5.0	--	1
Naphthalene	ND		ug/l	2.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/l	3.0	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1
Benzo(a)anthracene	ND		ug/l	2.0	--	1
Benzo(a)pyrene	ND		ug/l	2.0	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306

Project Number: 107911.ENV **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-01	Date Collected:	03/19/15 07:55
Client ID:	CDM-2	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(b)fluoranthene	ND		ug/l	2.0	--	1
Benzo(k)fluoranthene	ND		ug/l	2.0	--	1
Chrysene	ND		ug/l	2.0	--	1
Acenaphthylene	ND		ug/l	2.0	--	1
Anthracene	ND		ug/l	2.0	--	1
Benzo(ghi)perylene	ND		ug/l	2.0	--	1
Fluorene	ND		ug/l	2.0	--	1
Phenanthrene	ND		ug/l	2.0	--	1
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	2.0	--	1
Pyrene	ND		ug/l	2.0	--	1
Aniline	ND		ug/l	2.0	--	1
4-Chloroaniline	ND		ug/l	5.0	--	1
Dibenzofuran	ND		ug/l	2.0	--	1
2-Methylnaphthalene	ND		ug/l	2.0	--	1
Acetophenone	ND		ug/l	5.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	10	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
Pentachlorophenol	ND		ug/l	10	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	41		15-110
Phenol-d6	30		15-110
Nitrobenzene-d5	84		30-130
2-Fluorobiphenyl	77		30-130
2,4,6-Tribromophenol	89		15-110
4-Terphenyl-d14	79		30-130

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Project Name: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID: L1505306-01
Client ID: CDM-2
Sample Location: CAMBRIDGE, MA
Matrix: Water
Analytical Method: 97,8270D-SIM
Analytical Date: 03/25/15 14:12
Analyst: KV

Date Collected: 03/19/15 07:55
Date Received: 03/19/15
Field Prep: Field Filtered (Metals)
Extraction Method: EPA 3510C
Extraction Date: 03/24/15 17:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics by SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.20	--	1
2-Chloronaphthalene	ND		ug/l	0.20	--	1
Fluoranthene	ND		ug/l	0.20	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	0.20	--	1
Benzo(a)anthracene	ND		ug/l	0.20	--	1
Benzo(a)pyrene	ND		ug/l	0.20	--	1
Benzo(b)fluoranthene	ND		ug/l	0.20	--	1
Benzo(k)fluoranthene	ND		ug/l	0.20	--	1
Chrysene	ND		ug/l	0.20	--	1
Acenaphthylene	ND		ug/l	0.20	--	1
Anthracene	ND		ug/l	0.20	--	1
Benzo(ghi)perylene	ND		ug/l	0.20	--	1
Fluorene	ND		ug/l	0.20	--	1
Phenanthrene	ND		ug/l	0.20	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.20	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.20	--	1
Pyrene	ND		ug/l	0.20	--	1
2-Methylnaphthalene	ND		ug/l	0.20	--	1
Pentachlorophenol	ND		ug/l	0.80	--	1
Hexachlorobenzene	ND		ug/l	0.80	--	1
Hexachloroethane	ND		ug/l	0.80	--	1

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306

Project Number: 107911.ENV **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-01	Date Collected:	03/19/15 07:55
Client ID:	CDM-2	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics by SIM - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	40		15-110
Phenol-d6	29		15-110
Nitrobenzene-d5	75		30-130
2-Fluorobiphenyl	78		30-130
2,4,6-Tribromophenol	67		15-110
4-Terphenyl-d14	74		30-130

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV

Lab Number: L1505306
Report Date: 03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-02	Date Collected:	03/19/15 09:45
Client ID:	CDM-3	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	97,8270D	Extraction Date:	03/24/15 17:16
Analytical Date:	03/25/15 22:38		
Analyst:	RC		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/l	2.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Hexachlorobenzene	ND		ug/l	2.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
2-Chloronaphthalene	ND		ug/l	2.0	--	1
1,2-Dichlorobenzene	ND		ug/l	2.0	--	1
1,3-Dichlorobenzene	ND		ug/l	2.0	--	1
1,4-Dichlorobenzene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene	ND		ug/l	2.0	--	1
Fluoranthene	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorobutadiene	ND		ug/l	2.0	--	1
Hexachloroethane	ND		ug/l	2.0	--	1
Isophorone	ND		ug/l	5.0	--	1
Naphthalene	ND		ug/l	2.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
Bis(2-Ethylhexyl)phthalate	ND		ug/l	3.0	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1
Benzo(a)anthracene	ND		ug/l	2.0	--	1
Benzo(a)pyrene	ND		ug/l	2.0	--	1

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Project Name: KING OPEN SCHOOL **Lab Number:** L1505306

Project Number: 107911.ENV **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-02	Date Collected:	03/19/15 09:45
Client ID:	CDM-3	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(b)fluoranthene	ND		ug/l	2.0	--	1
Benzo(k)fluoranthene	ND		ug/l	2.0	--	1
Chrysene	ND		ug/l	2.0	--	1
Acenaphthylene	ND		ug/l	2.0	--	1
Anthracene	ND		ug/l	2.0	--	1
Benzo(ghi)perylene	ND		ug/l	2.0	--	1
Fluorene	ND		ug/l	2.0	--	1
Phenanthrene	ND		ug/l	2.0	--	1
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	2.0	--	1
Pyrene	ND		ug/l	2.0	--	1
Aniline	ND		ug/l	2.0	--	1
4-Chloroaniline	ND		ug/l	5.0	--	1
Dibenzofuran	ND		ug/l	2.0	--	1
2-Methylnaphthalene	ND		ug/l	2.0	--	1
Acetophenone	ND		ug/l	5.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	10	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
Pentachlorophenol	ND		ug/l	10	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	41		15-110
Phenol-d6	29		15-110
Nitrobenzene-d5	86		30-130
2-Fluorobiphenyl	78		30-130
2,4,6-Tribromophenol	103		15-110
4-Terphenyl-d14	88		30-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306

Project Number: 107911.ENV **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-02	Date Collected:	03/19/15 09:45
Client ID:	CDM-3	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	97,8270D-SIM	Extraction Date:	03/24/15 17:20
Analytical Date:	03/25/15 14:42		
Analyst:	KV		

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics by SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.20	--	1
2-Chloronaphthalene	ND		ug/l	0.20	--	1
Fluoranthene	ND		ug/l	0.20	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	0.20	--	1
Benzo(a)anthracene	ND		ug/l	0.20	--	1
Benzo(a)pyrene	ND		ug/l	0.20	--	1
Benzo(b)fluoranthene	ND		ug/l	0.20	--	1
Benzo(k)fluoranthene	ND		ug/l	0.20	--	1
Chrysene	ND		ug/l	0.20	--	1
Acenaphthylene	ND		ug/l	0.20	--	1
Anthracene	ND		ug/l	0.20	--	1
Benzo(ghi)perylene	ND		ug/l	0.20	--	1
Fluorene	ND		ug/l	0.20	--	1
Phenanthrene	0.25		ug/l	0.20	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.20	--	1
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.20	--	1
Pyrene	ND		ug/l	0.20	--	1
2-Methylnaphthalene	ND		ug/l	0.20	--	1
Pentachlorophenol	ND		ug/l	0.80	--	1
Hexachlorobenzene	ND		ug/l	0.80	--	1
Hexachloroethane	ND		ug/l	0.80	--	1

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1505306
Project Number:	107911.ENV	**Report Date:**	03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-02	Date Collected:	03/19/15 09:45
Client ID:	CDM-3	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics by SIM - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	39		15-110
Phenol-d6	30		15-110
Nitrobenzene-d5	76		30-130
2-Fluorobiphenyl	84		30-130
2,4,6-Tribromophenol	77		15-110
4-Terphenyl-d14	87		30-130

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 03/25/15 11:05
Analyst: RC

Extraction Method: EPA 3510C
Extraction Date: 03/24/15 17:16

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG770508-1					
Acenaphthene	ND		ug/l	2.0	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Hexachlorobenzene	ND		ug/l	2.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
2-Chloronaphthalene	ND		ug/l	2.0	--
1,2-Dichlorobenzene	ND		ug/l	2.0	--
1,3-Dichlorobenzene	ND		ug/l	2.0	--
1,4-Dichlorobenzene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene	ND		ug/l	2.0	--
Fluoranthene	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorobutadiene	ND		ug/l	2.0	--
Hexachloroethane	ND		ug/l	2.0	--
Isophorone	ND		ug/l	5.0	--
Naphthalene	ND		ug/l	2.0	--
Nitrobenzene	ND		ug/l	2.0	--
Bis(2-Ethylhexyl)phthalate	ND		ug/l	3.0	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--
Benzo(a)anthracene	ND		ug/l	2.0	--
Benzo(a)pyrene	ND		ug/l	2.0	--

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306

Project Number: 107911.ENV **Report Date:** 03/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 03/25/15 11:05
Analyst: RC

Extraction Method: EPA 3510C
Extraction Date: 03/24/15 17:16

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG770508-1					
Benzo(b)fluoranthene	ND		ug/l	2.0	--
Benzo(k)fluoranthene	ND		ug/l	2.0	--
Chrysene	ND		ug/l	2.0	--
Acenaphthylene	ND		ug/l	2.0	--
Anthracene	ND		ug/l	2.0	--
Benzo(ghi)perylene	ND		ug/l	2.0	--
Fluorene	ND		ug/l	2.0	--
Phenanthrene	ND		ug/l	2.0	--
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--
Indeno(1,2,3-cd)Pyrene	ND		ug/l	2.0	--
Pyrene	ND		ug/l	2.0	--
Aniline	ND		ug/l	2.0	--
4-Chloroaniline	ND		ug/l	5.0	--
Dibenzofuran	ND		ug/l	2.0	--
2-Methylnaphthalene	ND		ug/l	2.0	--
Acetophenone	ND		ug/l	5.0	--
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
2-Chlorophenol	ND		ug/l	2.0	--
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	10	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
Pentachlorophenol	ND		ug/l	10	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol	ND		ug/l	5.0	--
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--
2,4,5-Trichlorophenol	ND		ug/l	5.0	--

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Project Name: KING OPEN SCHOOL
Lab Number: L1505306
Project Number: 107911.ENV
Report Date: 03/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 03/25/15 11:05
Analyst: RC

Extraction Method: EPA 3510C
Extraction Date: 03/24/15 17:16

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-02 Batch: WG770508-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	48		15-110
Phenol-d6	34		15-110
Nitrobenzene-d5	91		30-130
2-Fluorobiphenyl	82		30-130
2,4,6-Tribromophenol	109		15-110
4-Terphenyl-d14	89		30-130

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV

Lab Number: L1505306
Report Date: 03/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D-SIM
Analytical Date: 03/25/15 12:40
Analyst: KV

Extraction Method: EPA 3510C
Extraction Date: 03/24/15 17:20

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics by SIM - Westborough Lab for sample(s): 01-02 Batch: WG770510-1					
Acenaphthene	ND		ug/l	0.20	--
2-Chloronaphthalene	ND		ug/l	0.20	--
Fluoranthene	ND		ug/l	0.20	--
Hexachlorobutadiene	ND		ug/l	0.50	--
Naphthalene	ND		ug/l	0.20	--
Benzo(a)anthracene	ND		ug/l	0.20	--
Benzo(a)pyrene	ND		ug/l	0.20	--
Benzo(b)fluoranthene	ND		ug/l	0.20	--
Benzo(k)fluoranthene	ND		ug/l	0.20	--
Chrysene	ND		ug/l	0.20	--
Acenaphthylene	ND		ug/l	0.20	--
Anthracene	ND		ug/l	0.20	--
Benzo(ghi)perylene	ND		ug/l	0.20	--
Fluorene	ND		ug/l	0.20	--
Phenanthrene	ND		ug/l	0.20	--
Dibenzo(a,h)anthracene	ND		ug/l	0.20	--
Indeno(1,2,3-cd)Pyrene	ND		ug/l	0.20	--
Pyrene	ND		ug/l	0.20	--
2-Methylnaphthalene	ND		ug/l	0.20	--
Pentachlorophenol	ND		ug/l	0.80	--
Hexachlorobenzene	ND		ug/l	0.80	--
Hexachloroethane	ND		ug/l	0.80	--

Project Name: KING OPEN SCHOOL
Lab Number: L1505306
Project Number: 107911.ENV
Report Date: 03/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D-SIM
Analytical Date: 03/25/15 12:40
Analyst: KV

Extraction Method: EPA 3510C
Extraction Date: 03/24/15 17:20

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics by SIM - Westborough Lab for sample(s): 01-02 Batch: WG770510-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	46		15-110
Phenol-d6	36		15-110
Nitrobenzene-d5	82		30-130
2-Fluorobiphenyl	87		30-130
2,4,6-Tribromophenol	72		15-110
4-Terphenyl-d14	87		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV
Lab Number: L1505306
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG770508-2 WG770508-3								
Acenaphthene	65		72		40-140	10		20
1,2,4-Trichlorobenzene	61		67		40-140	9		20
Hexachlorobenzene	67		78		40-140	15		20
Bis(2-chloroethyl)ether	53		61		40-140	14		20
2-Chloronaphthalene	66		75		40-140	13		20
1,2-Dichlorobenzene	56		62		40-140	10		20
1,3-Dichlorobenzene	53		58		40-140	9		20
1,4-Dichlorobenzene	54		61		40-140	12		20
3,3'-Dichlorobenzidine	49		54		40-140	10		20
2,4-Dinitrotoluene	66		79		40-140	18		20
2,6-Dinitrotoluene	67		74		40-140	10		20
Azobenzene	75		87		40-140	15		20
Fluoranthene	68		75		40-140	10		20
4-Bromophenyl phenyl ether	68		77		40-140	12		20
Bis(2-chloroisopropyl)ether	54		61		40-140	12		20
Bis(2-chloroethoxy)methane	58		65		40-140	11		20
Hexachlorobutadiene	66		73		40-140	10		20
Hexachloroethane	59		69		40-140	16		20
Isophorone	64		73		40-140	13		20
Naphthalene	60		67		40-140	11		20
Nitrobenzene	70		78		40-140	11		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV

Lab Number: L1505306
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG770508-2 WG770508-3								
Bis(2-Ethylhexyl)phthalate	75		87		40-140	15		20
Butyl benzyl phthalate	73		82		40-140	12		20
Di-n-butylphthalate	74		82		40-140	10		20
Di-n-octylphthalate	77		86		40-140	11		20
Diethyl phthalate	72		80		40-140	11		20
Dimethyl phthalate	68		76		40-140	11		20
Benzo(a)anthracene	69		78		40-140	12		20
Benzo(a)pyrene	70		79		40-140	12		20
Benzo(b)fluoranthene	74		82		40-140	10		20
Benzo(k)fluoranthene	72		81		40-140	12		20
Chrysene	67		74		40-140	10		20
Acenaphthylene	65		73		40-140	12		20
Anthracene	68		78		40-140	14		20
Benzo(ghi)perylene	70		80		40-140	13		20
Fluorene	65		74		40-140	13		20
Phenanthrene	67		76		40-140	13		20
Dibenzo(a,h)anthracene	70		80		40-140	13		20
Indeno(1,2,3-cd)Pyrene	72		82		40-140	13		20
Pyrene	67		76		40-140	13		20
Aniline	**18**	Q	**20**	Q	40-140	11		20
4-Chloroaniline	69		80		40-140	15		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Lab Number: L1505306
Project Number: 107911.ENV
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG770508-2 WG770508-3								
Dibenzofuran	68		74		40-140	8		20
2-Methylnaphthalene	60		70		40-140	15		20
Acetophenone	62		71		40-140	14		20
2,4,6-Trichlorophenol	68		76		30-130	11		20
2-Chlorophenol	54		61		30-130	12		20
2,4-Dichlorophenol	66		76		30-130	14		20
2,4-Dimethylphenol	61		70		30-130	14		20
2-Nitrophenol	61		70		30-130	14		20
4-Nitrophenol	52		58		30-130	11		20
2,4-Dinitrophenol	60		67		30-130	11		20
Pentachlorophenol	66		76		30-130	14		20
Phenol	**22**	Q	**28**	Q	30-130	**24**	Q	20
2-Methylphenol	48		55		30-130	14		20
3-Methylphenol/4-Methylphenol	46		54		30-130	16		20
2,4,5-Trichlorophenol	72		81		30-130	12		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV

Lab Number: L1505306
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits

MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-02 Batch: WG770508-2 WG770508-3

Surrogate	*LCS %Recovery*	*Qual*	*LCSD %Recovery*	*Qual*	*Acceptance Criteria*
2-Fluorophenol	37		41		15-110
Phenol-d6	25		30		15-110
Nitrobenzene-d5	69		79		30-130
2-Fluorobiphenyl	67		74		30-130
2,4,6-Tribromophenol	81		87		15-110
4-Terphenyl-d14	65		72		30-130

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV

Lab Number: L1505306
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics by SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG770510-2 WG770510-3								
Acenaphthene	63		77		40-140	20		20
2-Chloronaphthalene	62		75		40-140	19		20
Fluoranthene	68		76		40-140	11		20
Hexachlorobutadiene	57		69		40-140	19		20
Naphthalene	63		74		40-140	16		20
Benzo(a)anthracene	68		76		40-140	11		20
Benzo(a)pyrene	72		79		40-140	9		20
Benzo(b)fluoranthene	69		76		40-140	10		20
Benzo(k)fluoranthene	68		74		40-140	8		20
Chrysene	71		79		40-140	11		20
Acenaphthylene	66		79		40-140	18		20
Anthracene	64		72		40-140	12		20
Benzo(ghi)perylene	64		70		40-140	9		20
Fluorene	64		76		40-140	17		20
Phenanthrene	66		75		40-140	13		20
Dibenzo(a,h)anthracene	67		74		40-140	10		20
Indeno(1,2,3-cd)Pyrene	66		73		40-140	10		20
Pyrene	67		75		40-140	11		20
2-Methylnaphthalene	66		78		40-140	17		20
Pentachlorophenol	55		64		30-130	15		20
Hexachlorobenzene	62		70		40-140	12		20

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Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV

Lab Number: L1505306
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics by SIM - Westborough Lab Associated sample(s): 01-02 Batch: WG770510-2 WG770510-3								
Hexachloroethane	64		75		40-140	16		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	70		45		15-110
Phenol-d6	54		34		15-110
Nitrobenzene-d5	128		80		30-130
2-Fluorobiphenyl	**155**	Q	91		30-130
2,4,6-Tribromophenol	**113**	Q	75		15-110
4-Terphenyl-d14	**131**	Q	82		30-130

PETROLEUM HYDROCARBONS

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1505306
Project Number:	107911.ENV	**Report Date:**	03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-01	Date Collected:	03/19/15 07:55
Client ID:	CDM-2	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	98,EPH-04-1.1	Extraction Date:	03/25/15 16:59
Analytical Date:	03/26/15 18:10	Cleanup Method1:	EPH-04-1
Analyst:	AR	Cleanup Date1:	03/26/15

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	ND		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	85		40-140
o-Terphenyl	85		40-140
2-Fluorobiphenyl	84		40-140
2-Bromonaphthalene	86		40-140

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-02	Date Collected:	03/19/15 09:45
Client ID:	CDM-3	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	98,EPH-04-1.1	Extraction Date:	03/25/15 16:59
Analytical Date:	03/26/15 18:53	Cleanup Method1:	EPH-04-1
Analyst:	AR	Cleanup Date1:	03/26/15

Quality Control Information

Condition of sample received:	Satisfactory
Aqueous Preservative:	Laboratory Provided Preserved Container
Sample Temperature upon receipt:	Received on Ice
Sample Extraction method:	Extracted Per the Method

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Extractable Petroleum Hydrocarbons - Westborough Lab						
C9-C18 Aliphatics	ND		ug/l	100	--	1
C19-C36 Aliphatics	540		ug/l	100	--	1
C11-C22 Aromatics	ND		ug/l	100	--	1
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	49		40-140
o-Terphenyl	84		40-140
2-Fluorobiphenyl	94		40-140
2-Bromonaphthalene	97		40-140

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Project Name: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 03/26/15 16:01
Analyst: AR

Extraction Method: EPA 3510C
Extraction Date: 03/25/15 16:59
Cleanup Method: EPH-04-1
Cleanup Date: 03/26/15

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01-02 Batch: WG770867-1					
C9-C18 Aliphatics	ND		ug/l	100	--
C19-C36 Aliphatics	ND		ug/l	100	--
C11-C22 Aromatics	ND		ug/l	100	--
C11-C22 Aromatics, Adjusted	ND		ug/l	100	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	67		40-140
o-Terphenyl	68		40-140
2-Fluorobiphenyl	72		40-140
2-Bromonaphthalene	72		40-140

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV

Lab Number: L1505306
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG770867-2 WG770867-3								
C9-C18 Aliphatics	82		82		40-140	0		25
C19-C36 Aliphatics	97		92		40-140	5		25
C11-C22 Aromatics	104		108		40-140	4		25
Naphthalene	90		95		40-140	5		25
2-Methylnaphthalene	99		103		40-140	4		25
Acenaphthylene	92		96		40-140	4		25
Acenaphthene	99		103		40-140	4		25
Fluorene	99		104		40-140	5		25
Phenanthrene	106		108		40-140	2		25
Anthracene	113		116		40-140	3		25
Fluoranthene	106		108		40-140	2		25
Pyrene	107		110		40-140	3		25
Benzo(a)anthracene	102		106		40-140	4		25
Chrysene	105		109		40-140	4		25
Benzo(b)fluoranthene	106		110		40-140	4		25
Benzo(k)fluoranthene	103		108		40-140	5		25
Benzo(a)pyrene	104		110		40-140	6		25
Indeno(1,2,3-cd)Pyrene	81		92		40-140	13		25
Dibenzo(a,h)anthracene	67		75		40-140	11		25
Benzo(ghi)perylene	96		110		40-140	14		25
Nonane (C9)	52		54		30-140	4		25

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV

Lab Number: L1505306
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01-02 Batch: WG770867-2 WG770867-3								
Decane (C10)	63		65		40-140	3		25
Dodecane (C12)	72		72		40-140	0		25
Tetradecane (C14)	78		77		40-140	1		25
Hexadecane (C16)	85		83		40-140	2		25
Octadecane (C18)	91		88		40-140	3		25
Nonadecane (C19)	91		88		40-140	3		25
Eicosane (C20)	90		88		40-140	2		25
Docosane (C22)	90		87		40-140	3		25
Tetracosane (C24)	92		89		40-140	3		25
Hexacosane (C26)	90		88		40-140	2		25
Octacosane (C28)	91		88		40-140	3		25
Triacontane (C30)	91		88		40-140	3		25
Hexatriacontane (C36)	80		84		40-140	5		25

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Chloro-Octadecane	89		86		40-140
o-Terphenyl	103		105		40-140
2-Fluorobiphenyl	104		106		40-140
2-Bromonaphthalene	107		110		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		

PCBS

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1505306
Project Number:	107911.ENV	**Report Date:**	03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-01	Date Collected:	03/19/15 07:55
Client ID:	CDM-2	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	97,8082	Extraction Date:	03/24/15 17:27
Analytical Date:	03/25/15 06:12	Cleanup Method:	EPA 3665A
Analyst:	JT	Cleanup Date:	03/25/15
		Cleanup Method:	EPA 3660B
		Cleanup Date:	03/25/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/l	0.250	--	1	A
Aroclor 1221	ND		ug/l	0.250	--	1	A
Aroclor 1232	ND		ug/l	0.250	--	1	A
Aroclor 1242	ND		ug/l	0.250	--	1	A
Aroclor 1248	ND		ug/l	0.250	--	1	A
Aroclor 1254	ND		ug/l	0.250	--	1	A
Aroclor 1260	ND		ug/l	0.250	--	1	A
Aroclor 1262	ND		ug/l	0.250	--	1	A
Aroclor 1268	ND		ug/l	0.250	--	1	A
PCBs, Total	ND		ug/l	0.250	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	49		30-150	A
Decachlorobiphenyl	67		30-150	A
2,4,5,6-Tetrachloro-m-xylene	47		30-150	B
Decachlorobiphenyl	58		30-150	B

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID:	L1505306-02	Date Collected:	03/19/15 09:45
Client ID:	CDM-3	Date Received:	03/19/15
Sample Location:	CAMBRIDGE, MA	Field Prep:	Field Filtered (Metals)
Matrix:	Water	Extraction Method:	EPA 3510C
Analytical Method:	97,8082	Extraction Date:	03/24/15 17:27
Analytical Date:	03/25/15 06:24	Cleanup Method:	EPA 3665A
Analyst:	JT	Cleanup Date:	03/25/15
		Cleanup Method:	EPA 3660B
		Cleanup Date:	03/25/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/l	0.250	--	1	A
Aroclor 1221	ND		ug/l	0.250	--	1	A
Aroclor 1232	ND		ug/l	0.250	--	1	A
Aroclor 1242	ND		ug/l	0.250	--	1	A
Aroclor 1248	ND		ug/l	0.250	--	1	A
Aroclor 1254	ND		ug/l	0.250	--	1	A
Aroclor 1260	ND		ug/l	0.250	--	1	A
Aroclor 1262	ND		ug/l	0.250	--	1	A
Aroclor 1268	ND		ug/l	0.250	--	1	A
PCBs, Total	ND		ug/l	0.250	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	56		30-150	A
Decachlorobiphenyl	39		30-150	A
2,4,5,6-Tetrachloro-m-xylene	51		30-150	B
Decachlorobiphenyl	35		30-150	B

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306

Project Number: 107911.ENV **Report Date:** 03/27/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082
Analytical Date: 03/25/15 04:33
Analyst: JT

Extraction Method: EPA 3510C
Extraction Date: 03/24/15 17:27
Cleanup Method: EPA 3665A
Cleanup Date: 03/25/15
Cleanup Method: EPA 3660B
Cleanup Date: 03/25/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-02 Batch: WG770514-1						
Aroclor 1016	ND		ug/l	0.250	--	A
Aroclor 1221	ND		ug/l	0.250	--	A
Aroclor 1232	ND		ug/l	0.250	--	A
Aroclor 1242	ND		ug/l	0.250	--	A
Aroclor 1248	ND		ug/l	0.250	--	A
Aroclor 1254	ND		ug/l	0.250	--	A
Aroclor 1260	ND		ug/l	0.250	--	A
Aroclor 1262	ND		ug/l	0.250	--	A
Aroclor 1268	ND		ug/l	0.250	--	A
PCBs, Total	ND		ug/l	0.250	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	42		30-150	A
Decachlorobiphenyl	64		30-150	A
2,4,5,6-Tetrachloro-m-xylene	37		30-150	B
Decachlorobiphenyl	58		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-02 Batch: WG770514-2 WG770514-3									
Aroclor 1016	49		46		40-140	7		20	A
Aroclor 1260	58		53		40-140	9		20	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	43		40		30-150	A
Decachlorobiphenyl	69		65		30-150	A
2,4,5,6-Tetrachloro-m-xylene	39		36		30-150	B
Decachlorobiphenyl	63		58		30-150	B

METALS

Project Name: KING OPEN SCHOOL
Lab Number: L1505306
Project Number: 107911.ENV
Report Date: 03/27/15

SAMPLE RESULTS

Lab ID: L1505306-01
Date Collected: 03/19/15 07:55
Client ID: CDM-2
Date Received: 03/19/15
Sample Location: CAMBRIDGE, MA
Field Prep: Field Filtered (Metals)
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Dissolved Metals - Westborough Lab											
Arsenic, Dissolved	ND		mg/l	0.005	--	1	03/24/15 14:52	03/24/15 22:11	EPA 3005A	97,6010C	TT
Barium, Dissolved	0.573		mg/l	0.010	--	1	03/24/15 14:52	03/24/15 22:11	EPA 3005A	97,6010C	TT
Cadmium, Dissolved	ND		mg/l	0.004	--	1	03/24/15 14:52	03/24/15 22:11	EPA 3005A	97,6010C	TT
Chromium, Dissolved	ND		mg/l	0.01	--	1	03/24/15 14:52	03/24/15 22:11	EPA 3005A	97,6010C	TT
Lead, Dissolved	ND		mg/l	0.010	--	1	03/24/15 14:52	03/24/15 22:11	EPA 3005A	97,6010C	TT
Mercury, Dissolved	ND		mg/l	0.0002	--	1	03/20/15 11:02	03/20/15 17:39	EPA 7470A	97,7470A	AB
Selenium, Dissolved	ND		mg/l	0.010	--	1	03/24/15 14:52	03/24/15 22:11	EPA 3005A	97,6010C	TT
Silver, Dissolved	ND		mg/l	0.007	--	1	03/24/15 14:52	03/24/15 22:11	EPA 3005A	97,6010C	TT

Project Name: KING OPEN SCHOOL | **Lab Number:** L1505306

Project Number: 107911.ENV | **Report Date:** 03/27/15

SAMPLE RESULTS

Lab ID: L1505306-02
Client ID: CDM-3
Sample Location: CAMBRIDGE, MA
Matrix: Water

Date Collected: 03/19/15 09:45
Date Received: 03/19/15
Field Prep: Field Filtered (Metals)

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Dissolved Metals - Westborough Lab											
Arsenic, Dissolved	0.009		mg/l	0.005	--	1	03/24/15 14:52	03/24/15 22:15	EPA 3005A	97,6010C	TT
Barium, Dissolved	0.108		mg/l	0.010	--	1	03/24/15 14:52	03/24/15 22:15	EPA 3005A	97,6010C	TT
Cadmium, Dissolved	ND		mg/l	0.004	--	1	03/24/15 14:52	03/24/15 22:15	EPA 3005A	97,6010C	TT
Chromium, Dissolved	ND		mg/l	0.0100	--	1	03/24/15 14:52	03/24/15 22:15	EPA 3005A	97,6010C	TT
Lead, Dissolved	ND		mg/l	0.010	--	1	03/24/15 14:52	03/24/15 22:15	EPA 3005A	97,6010C	TT
Mercury, Dissolved	ND		mg/l	0.0002	--	1	03/20/15 11:02	03/20/15 17:41	EPA 7470A	97,7470A	AB
Selenium, Dissolved	ND		mg/l	0.010	--	1	03/24/15 14:52	03/24/15 22:15	EPA 3005A	97,6010C	TT
Silver, Dissolved	ND		mg/l	0.007	--	1	03/24/15 14:52	03/24/15 22:15	EPA 3005A	97,6010C	TT

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Project Name: KING OPEN SCHOOL **Lab Number:** L1505306
Project Number: 107911.ENV **Report Date:** 03/27/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Dissolved Metals - Westborough Lab for sample(s): 01-02 Batch: WG769652-1										
Mercury, Dissolved	ND		mg/l	0.0002	--	1	03/20/15 11:02	03/20/15 17:30	97,7470A	AB

Prep Information

Digestion Method: EPA 7470A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Dissolved Metals - Westborough Lab for sample(s): 01-02 Batch: WG770384-1										
Arsenic, Dissolved	ND		mg/l	0.005	--	1	03/24/15 14:52	03/24/15 21:52	97,6010C	TT
Barium, Dissolved	ND		mg/l	0.010	--	1	03/24/15 14:52	03/24/15 21:52	97,6010C	TT
Cadmium, Dissolved	ND		mg/l	0.004	--	1	03/24/15 14:52	03/24/15 21:52	97,6010C	TT
Chromium, Dissolved	ND		mg/l	0.01	--	1	03/24/15 14:52	03/24/15 21:52	97,6010C	TT
Lead, Dissolved	ND		mg/l	0.010	--	1	03/24/15 14:52	03/24/15 21:52	97,6010C	TT
Selenium, Dissolved	ND		mg/l	0.010	--	1	03/24/15 14:52	03/24/15 21:52	97,6010C	TT
Silver, Dissolved	ND		mg/l	0.007	--	1	03/24/15 14:52	03/24/15 21:52	97,6010C	TT

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis
Batch Quality Control

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV

Lab Number: L1505306
Report Date: 03/27/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Dissolved Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG769652-2 WG769652-3								
Mercury, Dissolved	111		112		80-120	1		20
MCP Dissolved Metals - Westborough Lab Associated sample(s): 01-02 Batch: WG770384-2 WG770384-3								
Arsenic, Dissolved	97		80		80-120	19		20
Barium, Dissolved	97		92		80-120	5		20
Cadmium, Dissolved	106		99		80-120	7		20
Chromium, Dissolved	95		90		80-120	5		20
Lead, Dissolved	81		99		80-120	20		20
Selenium, Dissolved	82		102		80-120	**22**	Q	20
Silver, Dissolved	99		93		80-120	6		20

Project Name: KING OPEN SCHOOL
Project Number: 107911.ENV

Lab Number: L1505306
Report Date: 03/27/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: NA

Cooler Information Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1505306-01A	Vial HCl preserved	A	NA	5.3	Y	Absent	MCP-8260-10(14)
L1505306-01B	Vial HCl preserved	A	NA	5.3	Y	Absent	MCP-8260-10(14)
L1505306-01C	Vial HCl preserved	A	NA	5.3	Y	Absent	MCP-8260-10(14)
L1505306-01D	Amber 1000ml HCl preserved	A	7	5.3	Y	Absent	EPH-10(14)
L1505306-01E	Amber 1000ml HCl preserved	A	<2	5.3	Y	Absent	EPH-10(14)
L1505306-01F	Amber 1000ml unpreserved	A	7	5.3	Y	Absent	MCP-8082-10(365)
L1505306-01G	Amber 1000ml unpreserved	A	7	5.3	Y	Absent	MCP-8082-10(365)
L1505306-01H	Amber 1000ml unpreserved	A	7	5.3	Y	Absent	MCP-8270-10(7),MCP-8270SIM-10(7)
L1505306-01I	Amber 1000ml unpreserved	A	7	5.3	Y	Absent	MCP-8270-10(7),MCP-8270SIM-10(7)
L1505306-01J	Plastic 250ml HNO3 preserved	A	<2	5.3	Y	Absent	MCP-CD-6010S-10(180),MCP-7470S-10(28),MCP-AG-6010S-10(180),MCP-AS-6010S-10(180),MCP-CR-6010S-10(180),MCP-BA-6010S-10(180),MCP-PB-6010S-10(180),MCP-SE-6010S-10(180)
L1505306-02A	Vial HCl preserved	A	NA	5.3	Y	Absent	MCP-8260-10(14)
L1505306-02B	Vial HCl preserved	A	NA	5.3	Y	Absent	MCP-8260-10(14)
L1505306-02C	Vial HCl preserved	A	NA	5.3	Y	Absent	MCP-8260-10(14)
L1505306-02D	Amber 1000ml HCl preserved	A	<2	5.3	Y	Absent	EPH-10(14)
L1505306-02E	Amber 1000ml HCl preserved	A	<2	5.3	Y	Absent	EPH-10(14)
L1505306-02F	Amber 1000ml unpreserved	A	7	5.3	Y	Absent	MCP-8082-10(365)
L1505306-02G	Amber 1000ml unpreserved	A	7	5.3	Y	Absent	MCP-8082-10(365)
L1505306-02H	Amber 1000ml unpreserved	A	7	5.3	Y	Absent	MCP-8270-10(7),MCP-8270SIM-10(7)
L1505306-02I	Amber 1000ml unpreserved	A	7	5.3	Y	Absent	MCP-8270-10(7),MCP-8270SIM-10(7)

*Values in parentheses indicate holding time in days

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1505306-02J	Plastic 250ml HNO3 preserved	A	<2	5.3	Y	Absent	MCP-CD-6010S-10(180),MCP-7470S-10(28),MCP-AG-6010S-10(180),MCP-AS-6010S-10(180),MCP-CR-6010S-10(180),MCP-BA-6010S-10(180),MCP-PB-6010S-10(180),MCP-SE-6010S-10(180)

*Values in parentheses indicate holding time in days

GLOSSARY

Acronyms

EDL - Estimated 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 EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).

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

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

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 ten times (10x) 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. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

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.

Project Name:	KING OPEN SCHOOL	**Lab Number:**	L1505306
Project Number:	107911.ENV	**Report Date:**	03/27/15

Data Qualifiers

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 lower value for the two columns 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.

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.

S - Analytical results are from modified screening analysis.

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

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

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.

98 Method for the Determination of Extractable Petroleum Hydrocarbons (EPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of EPH under the Massachusetts Contingency Plan, WSC-CAM-IVB, 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.

Certification Information

Last revised December 16, 2014

The following analytes are not included in our NELAP Scope of Accreditation:

Westborough Facility
EPA 524.2: Acetone, 2-Butanone (Methyl ethyl ketone (MEK)), Tert-butyl alcohol, 2-Hexanone, Tetrahydrofuran, 1,3,5-Trichlorobenzene, 4-Methyl-2-pentanone (MIBK), Carbon disulfide, Diethyl ether.
EPA 8260C: 1,2,4,5-Tetramethylbenzene, 4-Ethyltoluene, Iodomethane (methyl iodide), Methyl methacrylate, Azobenzene.
EPA 8270D: 1-Methylnaphthalene, Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 625: 4-Chloroaniline, 4-Methylphenol.
SM4500: Soil: Total Phosphorus, TKN, NO2, NO3.
EPA 9071: Total Petroleum Hydrocarbons, Oil & Grease.

Mansfield Facility
EPA 8270D: Biphenyl.
EPA 2540D: TSS
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

The following analytes are included in our Massachusetts DEP Scope of Accreditation, Westborough Facility:

Drinking Water
EPA 200.8: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl; **EPA 200.7**: Ba,Be,Ca,Cd,Cr,Cu,Na; **EPA 245.1:** Mercury;
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, Enterolert-QT.**

Non-Potable Water
EPA 200.8: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn;
EPA 200.7: Al,Sb,As,Be,Cd,Ca,Cr,Co,Cu,Fe,Pb,Mg,Mn,Mo,Ni,K,Se,Ag,Na,Sr,Ti,Tl,V,Zn;
EPA 245.1, SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2340B, SM2320B, SM4500CL-E, SM4500F-BC, SM426C, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, SM4500P-B, E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, SM14 510AC, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: 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
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9222D-MF**.

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 3/19/15

ALPHA Job #: L1505306

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: CDM Smith

Address: 75 State Street Suite 701
Boston, MA 02109

Phone: 617-452-6000

Email: McMullenJF@cdmsmith.com

Project Information

Project Name: King Open School

Project Location: Cambridge, MA

Project #: 107911.ENV

Project Manager: Jay McMullen

ALPHA Quote #:

Turn-Around Time

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

Date Due: 3/26/15

Report Information - Data Deliverables

☒ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

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 ______ Criteria ______

Additional Project Information:

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
SVOCs

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	VOC	SVOC	METALS (MCP)	METALS (RCRA)	EPH	VPH	PCB	TPH	SVOCs	Sample Comments	TOTAL # BOTTLES
5306-01	CDM-2	3/19/15	7:55	GW	ES/ES	X			X	X		X		X		10
-02	CDM-3	3/19/15	9:45	GW	ES/ES	X			X	X		X		X		10
Container Type						V			P	A		A		A		
Preservative						B			C	B		A		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
Emily Doller	3/19/15 / 1400	~~[illegible]~~ AAL	3-19-15 14:20
[illegible signature]	3-19-15 / 15:20	[illegible signature]	3/19/15 15:20

FORM NO: 01-01 (rev. 12-Mar-2012)

7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1505306

Instrument ID: Quimby.i Calibration Date: 24-MAR-2015 Time: 04:47

Lab File ID: 0323A02 Init. Calib. Date(s): 13-JAN-2 13-JAN-2

Sample No: 8260 CCAL Init. Calib. Times : 10:02 15:17

Compound	$\overline{RRF}$	RRF	MIN RRF	%D	MAX %D	
dichlorodifluoromethane	.2707	.31633	.1	17	20	
chloromethane	.47056	.43131	.1	-8	20	
vinyl chloride	.35164	.38247	.1	9	20	
bromomethane	.22718	.25364	.1	12	20	
chloroethane	.25404	.29261	.1	15	20	
trichlorofluoromethane	.46793	.53083	.1	13	20	
ethyl ether	.14878	.17426	.05	17	20	
acrolein	.03081	.03738	.05	21	20	F
freon-113	.33131	.38692	.1	17	20	
acetone	100	92.700	.1	-7	20	
1,1,-dichloroethene	.30891	.35123	.1	14	20	
tert-butyl alcohol	500	369	.05	-26	20	F
iodomethane	.40046	.33474	.05	-16	20	
methyl acetate	.1379	.14401	.01	4	20	
methylene chloride	.33181	.39547	.1	19	20	
carbon disulfide	.86127	.87347	.1	1	20	
acrylonitrile	.08085	.0936	.05	16	20	
methyl tert butyl ether	.67472	.618	.1	-8	20	
Halothane	.24255	.281	.05	16	20	
trans-1,2-dichloroethene	.34129	.39088	.1	15	20	
Diisopropyl Ether	1.2107	1.1964	.05	-1	20	
vinyl acetate	.44293	.44666	.05	1	20	
1,1-dichloroethane	.68186	.75836	.2	11	20	
Ethyl-Tert-Butyl-Ether	1.0331	.85413	.05	-17	20	
2-butanone	100	90.706	.1	-9	20	
2,2-dichloropropane	.50193	.38558	.05	-23	20	F
ethyl acetate	.1703	.16984	.05	0	20	
cis-1,2-dichloroethene	.38283	.44837	.1	17	20	
chloroform	.58284	.68402	.2	17	20	
bromochloromethane	.14186	.17264	.05	22	20	F
tetrahydrofuran	100	98.450	.05	-2	20	
1,1,1-trichloroethane	.51972	.53597	.1	3	20	
cyclohexane	.74314	.78485	.01	6	30	
1,1-dichloropropene	.50569	.56606	.05	12	20	
carbontetrachloride	.41073	.4123	.1	0	20	
Tertiary-Amyl Methyl Ether	.77507	.5935	.05	-23	20	F
1,2-dichloroethane	.39882	.47017	.1	18	20	
benzene	1.4426	1.6613	.5	15	20	

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7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1505306

Instrument ID: Quimby.i   Calibration Date: 24-MAR-2015 Time: 04:47

Lab File ID: 0323A02   Init. Calib. Date(s): 13-JAN-2   13-JAN-2

Sample No: 8260 CCAL   Init. Calib. Times : 10:02   15:17

Compound	RRF (mean)	RRF	MIN RRF	%D	MAX %D	
trichloroethene	.36616	.41566	.2	14	20	
methyl cyclohexane	.6645	.67716	.01	2	30	
1,2-dichloropropane	.38822	.43494	.1	12	20	
bromodichloromethane	.40299	.45156	.2	12	20	
1,4-dioxane	.00161	.00201	.05	25	20	F
dibromomethane	.15155	.18477	.05	22	20	F
2-chloroethylvinyl ether	.13919	.13113	.05	-6	20	
4-methyl-2-pentanone	.08092	.07802	.1	-4	20	F
cis-1,3-dichloropropene	.51252	.49728	.2	-3	20	
toluene	1.2189	1.3843	.4	14	20	
ethyl-methacrylate	.39528	.36673	.01	-7	20	
trans-1,3-dichloropropene	.52299	.4547	.1	-13	20	
2-hexanone	.15989	.14269	.1	-11	20	
1,1,2-trichloroethane	.2559	.28422	.1	11	20	
1,3-dichloropropane	.55138	.61379	.05	11	20	
tetrachloroethene	.46234	.55012	.2	19	20	
chlorodibromomethane	.30891	.34059	.1	10	20	
1,2-dibromoethane	.28519	.30479	.1	7	20	
chlorobenzene	1.2956	1.5476	.5	19	20	
1,1,1,2-tetrachloroethane	.39147	.42695	.05	9	20	
ethyl benzene	2.3611	2.7822	.1	18	20	
p/m xylene	.92475	1.1130	.1	20	20	F
o xylene	.87725	1.0753	.3	23	20	F
styrene	1.4268	1.7594	.31	23	20	F
isopropylbenzene	2.3870	2.7727	.1	16	20	
bromoform	.29358	.31053	.1	6	20	
1,4-dichlorobutane	1.2392	1.2235	.01	-1	20	
1,1,2,2,-tetrachloroethane	100	111	.3	11	20	
1,2,3-trichloropropane	.50415	.54687	.05	8	20	
trans-1,4-dichloro-2-butene	.20136	.17302	.05	-14	20	
n-propylbenzene	5.2906	6.1393	.05	16	20	
bromobenzene	1.0030	1.1771	.05	17	20	
4-ethyltoluene	1.9655	2.3166	.05	18	20	
1,3,5-trimethybenzene	3.8407	4.5708	.05	19	20	
2-chlorotoluene	3.6913	4.2683	.05	16	20	
4-chorotoluene	3.4046	3.9388	.05	16	20	
tert-butylbenzene	3.3130	3.7538	.05	13	20	
1,2,4-trimethylbenzene	3.8644	4.5755	.05	18	20	

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7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1505306

Instrument ID: Quimby.i Calibration Date: 24-MAR-2015 Time: 04:47

Lab File ID: 0323A02 Init. Calib. Date(s): 13-JAN-2 13-JAN-2

Sample No: 8260 CCAL Init. Calib. Times : 10:02 15:17

Compound	$\overline{RRF}$	RRF	MIN RRF	%D	MAX %D	
sec-butylbenzene	4.7272	5.1723	.05	9	20	
p-isopropyltoluene	3.9215	4.4311	.05	13	20	
1,3-dichlorobenzene	2.0239	2.4487	.6	21	20	F
1,4-dichlorobenzene	2.0161	2.3784	.5	18	20	
n-butylbenzene	3.9944	4.3823	.05	10	20	
1,2,4,5-tetramethylbenezene	.96119	1.1363	.05	18	20	
1,2-dichlorobenzene	1.7838	2.1371	.4	20	20	
p-diethylbenzene	1.3430	1.6571	.05	23	20	F
1,2-dibromo-3-chloropropane	.08743	.07395	.05	-15	20	
1,3,5-trichlorobenzene	1.1429	1.3674	.01	20	30	
1,2,4-trichlorobenzene	.84227	.84503	.2	0	20	
hexachlorobutadiene	.37128	.42509	.05	14	20	
naphthalene	1.4639	1.2738	.05	-13	20	
1,2,3-trichlorobenzene	.62651	.61281	.05	-2	20	
dibromofluoromethane	.21413	.22644	.05	6	20	
1,2-dichloroethane-d4	.24204	.23114	.05	-5	20	
toluene-d8	1.2854	1.2767	.05	-1	20	
4-bromofluorobenzene	1.0009	.94329	.05	-6	20	

FORM VII MCP-8260-10

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CDM Smith

cdmsmith.com

Net Zero Energy Feasibility Report

King Open and Cambridge Street Upper School

City of Cambridge

Cambridge, Massachusetts

Revised: February 5, 2016

IP Project No. G150002-000

in:posse

reinventing human habitats

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

General

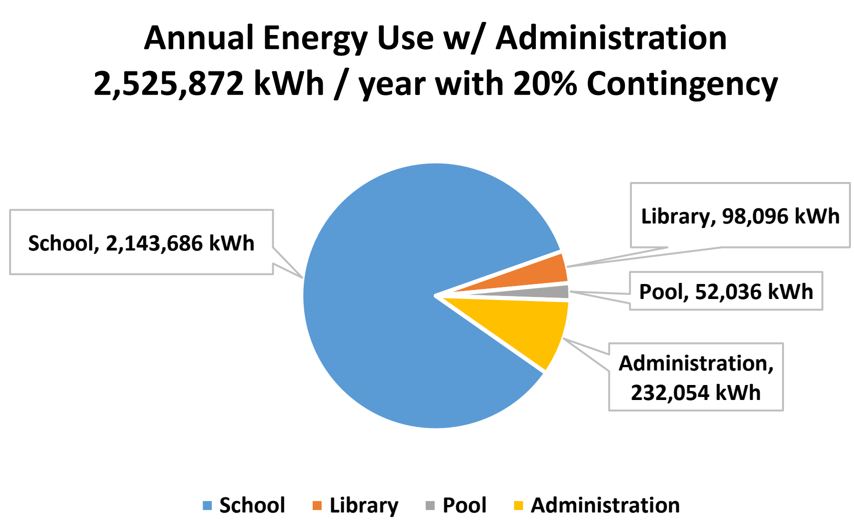
A major goal of the King Open and Cambridge Street Upper School project is to achieve net zero energy and emissions operation in support of the City of Cambridge Net Zero Energy Action Plan. Net zero energy (NZE) can be defined as a building that makes as much renewable energy on site as it uses over a one year period. This goal encourages energy efficient building designs, places a major focus on energy and requires building users to pay attention to their energy use.

An initial analysis of the required energy use of the project and the potential for renewable energy harvesting on-site indicates that, while possible, it will be difficult to achieve net zero energy operation on this site. Achievement of the net zero energy goal will depend on minimizing the energy use of the building and maximizing the amount of renewable energy harvested on site. It will also require the active engagement and participation of the building occupants and operating staff.

The project includes the construction of a new building complex to house the King Open Lower School, Cambridge Street Upper School, Valente branch of the Cambridge Public Library and a new outdoor swimming pool complex for community use. In addition, Cambridge Public Schools administrative offices have been considered for inclusion in the project. The NZE feasibility has been analyzed both with and without the inclusion of the administrative offices. The overall project area is approximately 262,000 sf including the school district administrative offices.

Current Energy Use Projections:

The projected annual energy use for the project has been estimated using energy modeling software. Detailed information about building loads and expected hours of use was taken from the very similar MLK School project, also in Cambridge. The energy model assumes that the building will be designed to be very energy efficient and includes strategies such as improved insulation and glass performance, low energy lighting systems, daylight harvesting and efficient geo-exchange (geothermal) HVAC systems. In addition, pool heating is assumed to be provided by solar thermal system and is not included in the energy requirements.



Current Renewable Energy Harvesting Potential

The preferred renewable energy system for the project is a photovoltaic system (PV). The amount of renewable energy that can be harvested on site depends on the efficiency of the PV panel used and the way the panels are mounted. A typical mounting for PV is to be mounted directly on roof surfaces. While this is a cost effective way to install PV systems, it will not generate enough energy to realize the NZE goal for this project. Mounting the PV panels in contiguous arrays with panels butted together and supported on an independent structure that is above the building roof or on-site will generate the most energy for the available area and will be the required mounting arrangement for the project to achieve the NZE goal.

In order to achieve the NZE goal, the most efficient PV panel available will need to be utilized. Based on existing available efficiencies, an independently supported contiguous array of 118,400 square feet will be required if the administrative spaces are not included in the project and a contiguous array of 130,390 square feet will be required if administrative areas are included in the project.

The Path to Net Zero Energy

Achievement of the net zero energy goal will require a combination of several strategies including the following:

- Reduce annual energy requirements of the project through continued optimization of the building design
- Engagement with occupants and building users to reduce their energy needs without sacrificing on building programs and mission.
- Strategies for purchasing the most efficient photovoltaic (PV) panels available for the project.
- Larger areas of PV supported on structures independent of building roof areas, either above the building or on site.
- Redefinition of the net zero energy goal for the project.

All of the above strategies and approaches can be implemented on the project but will require the full participation and engagement of all stakeholders. Achieving net zero energy will not occur without a change in mindset from business-as-usual to a mindset of active engagement in the goal. If net zero energy is to be achieved, it will be necessary to make changes in behavior. In addition, stakeholders will need to work hard at optimizing the use of energy on the project. Finally, changes in procurement for the PV system and changes to the design may be required. These are all possible and therefore net zero energy is a possibility for the King Open Lower School & Cambridge Street Upper School.

As a result of this NZE feasibility analysis, several measures have already been incorporated into the Feasibility Report and cost estimate including PV design with minimal self-shading, geothermal heating and cooling, improved double-pane glass performance, solar thermal pool heating and exterior solar shading for south facing glass areas. Additional measures will be analyzed and incorporated during the design phase.

2. INTRODUCTION TO NET ZERO ENERGY

Achieving Net Zero Energy

A net zero energy building harvests as much energy from renewable sources as it uses from non-renewable sources over an entire year. This is a simple definition but a very ambitious goal. Most projects have constraints related to available space for renewable energy systems or limited funds to purchase these systems. Therefore, achieving net zero energy operation requires that first a building be designed, constructed and operated to use as little energy as possible so that it can operate within the renewable energy resources available. Achieving this goal requires the full engagement and active participation of the owner, design team, construction team and the building occupants and users.

Defining Net Zero Energy

Most net zero energy buildings are connected to the electric utility grid. During periods of high renewable energy production, such as sunny days with mild temperatures, they often export energy to the grid. During periods of low or no renewable energy production, such as at night, they import energy from the grid. Over the course of an entire year the imported energy and exported energy net out to zero. This is a basic definition that provides the framework for what a net zero energy building is, but in order to fully define net zero energy, more information is needed about how energy use is accounted for and how renewable energy is harvested.

City of Cambridge Net Zero Energy Action Plan

In June, 2015, The City of Cambridge adopted a Net Zero 25-Year Action Plan that supports Cambridge's 2002 Climate Protection Action Plan commitment to reduce greenhouse gas emissions by 80% by the year 2050. The Action Plan includes steps to promote energy efficiency in existing buildings, encourage net zero energy new construction and shift the supply of energy for Cambridge away from fossil fuel based sources toward low or zero carbon sources with the ultimate goal being achieving net zero emissions on a community wide basis. The action plan timeline calls for all new Municipal buildings to be net zero emissions by 2020.

The city has indicated that the King Open project should meet the net zero energy goal for Municipal buildings. This goal as defined by the policy means a net zero energy building without the use of fossil fuels on site if possible, or by ending any use of on-site fossil fuels within 10 years.

Accounting for Energy Use

The National Renewable Energy Laboratories (NREL) has attempted to define net zero energy based on how building energy use is accounted for. They have established four generally accepted definitions of net zero energy buildings as follows:

- Net zero energy as accounted for at the site
- Net zero energy as accounted for at the source
- Net zero energy as accounted for on a cost basis
- Net zero energy as accounted for on a greenhouse gas emissions basis

Most net zero energy project account for energy use at the site. Under this definition, energy used and made is measured by meters at the project site. Annual energy use is measured and metered by the utility meters for gas and electric utilities. Annual renewable energy production is measured and metered by owner provided meters as well as net-metering at the electric utility meter.

Accounting for energy at the site encourages efficient building designs as well as the use of systems that use the least amount of energy at the site. Site NZE buildings often utilize systems such as geothermal heating and cooling which have very low site energy use.

The Cambridge Net Zero Energy Action Plan is based on emissions and therefore in order to comply, the project will need to account for energy on the basis of net zero greenhouse gas emissions. If the project proceeds without the use of on-site fossil fuels the energy use and renewable energy generation will be all electric in which case net zero energy as metered at the site should equate to net zero energy emissions as well.

If fossil fuels are combusted on-site, the emissions balance will need to be determined for the different energy sources. The Action Plan does not provide specific guidance on how emissions from different energy sources are supposed to be accounted for and therefore the approach to be followed will need to be developed and approved by the city.

Accounting for Renewable Energy

NREL has also looked at how renewable energy is harvested for net zero energy projects. They have developed a classification system based on where and how the renewable energy is harvested. For more information on the NREL classifications see the following publication: http://www.nrel.gov/sustainable_nrel/pdfs/44586.pdf. The following is a summary of the NREL classifications:

- Classification A: Buildings that utilize renewable energy harvested within the building footprint (roof).
- Classification B: Buildings that utilize renewable energy harvested within the building footprint and site.
- Classification C: Buildings that utilize the above strategies (A&B) to the extent possible and make up any difference by importing renewable energy from off-site to produce energy on site (biomass).
- Classification D: Buildings that utilize all of the above strategies (A, B &C) to the extent possible for renewable energy and make up any difference by purchasing renewable energy certificates.

The goal for the KOCSUS project is to harvest all renewable energy on-site and therefore be classified as a net zero energy building – classification B. This goal may be difficult due to the building's multiple stories and large size relative to the site. The goal of net zero energy is most readily achieved with buildings of one to two stories located on large sites. These buildings have a relatively low floor area to roof area ratio (2:1) and are candidates for achieving net zero energy with roof mounted renewable energy systems alone or with additional renewable energy systems located on their relatively large sites.

Impact of Net Zero Energy Definition on the Design

The preliminary basis of design relies primarily on electrical energy but does rely on fossil fuel (natural gas) for kitchen cooking equipment, heating of domestic hot water and as a back-up to the electrically powered geothermal heat pump system.

The basis of design intent is to off-set all on-site energy use, including natural gas, with on-site generated renewable energy from a combination of photovoltaic panels (PV) and solar thermal systems. With on-site fossil fuel use, it will be necessary to arrive at an agreed methodology for calculating the emissions from grid electricity, the emissions from on-site fossil fuel combustion and the emissions off-set provided by on-site renewable energy. With an all-electric building, grid electric emissions and on-site renewable emissions off-sets should have the same emissions impact per unit of energy and therefore tracking on-site energy should equate to tracking emissions.

Designing the building with natural gas equipment that would only be used for the next ten years does not make economic sense as the equipment would be retired well before the end of its useful life. Therefore, during the project design development options for eliminating on-site fossil fuel use will be investigated.

A preliminary investigation of an approach to eliminating all on-site fossil fuel use from the project indicates the following:

1. Kitchen Equipment – Electric cooking equipment can be substituted for gas cooking equipment. This change will impact the electric service size and cost but should not increase annual energy use or impact the renewable energy systems.
2. Domestic Hot Water Heating – Electrically powered heat pumps can be substituted for gas-fired water heaters. GGD has indicated that one (1) additional 70-ton heat pump is required to meet the DHW load. GDD has also proposed that twenty (20) geothermal wells be added to the project in order to meet the load.
    a. The solar thermal heating system proposed to provide swimming pool heating could be used the remainder of the year to provide a significant portion of the heat for the domestic hot water at little or no added cost. This approach will significantly reduce, and may eliminate, the need for additional wells.
3. Space Heating Back-up (Back-up to the geothermal system) - The current basis of design intent is to provide adequate wells to cover all heating and cooling for the building at design conditions without the need of supplemental heat. The basis of design utilizes multiple water-to-water heat pump units to produce hot water and chilled water for heating and cooling the building. No changes are required to the basis of design other than to provide for redundancy.
    a. GGD has indicated that two (2) 70-ton heat pumps should be added to the project to provide redundancy to the building in-case of a major equipment failure. The provision of the additional heat pumps is advisable as the heat pumps must operate in both heating and cooling

modes and spare units are needed to allow for maintenance and to maintain building temperature in the event of a heat pump failure.

b. GGD has also proposed that forty (40) geothermal wells be added to the well field for redundancy. This is based on a percentage of total wells. This is to ensure that loads are met in the event of a major pipe failure.

The main cost impact of eliminating on-site use of fossil fuels is the addition of geothermal wells. As the design is developed there are a number of features (and decisions) that should be incorporated into the design to eliminate (or reduce significantly) the need for additional wells as follows:

- Determine if it is acceptable for a fossil fuel (oil-fired) truck mounted boiler to be used in emergency situations only and significantly reduce the risk exposure. This would require provisions for a connection point for the temporary boiler. If an emergency boiler is required at any time, the amount of fuel used could be measured and a one-time carbon off-set purchased to off-set the emissions.
- Reduce the impact of major pipe failure in the geothermal system by ensuring that major pipe headers and horizontal runs are accessible (for instance don't run major piping under the building where it isn't accessible – run overhead until just before the pipe exits the building.
- Design the system with multiple headers to distribute to discrete sections of the well field so that the well field is sectionalized. This may be required from a design standpoint anyway as the wells will be distributed throughout the site in order to fit within the available space.
- Design the system with multiple exit points from the building to the well field to limit the impact of a failure in any of the main piping on the site. This approach works with the sectionalized well field with multiple headers.
- Limit the number of wells on each circuit that connects to a header to no more than 10% of the total well field. Failure of any one well would then only impact 10% of the well field until the individual well is isolated from the circuit and the circuit brought back on line.
- Utilize the solar thermal heating system proposed for the swimming pool to also serve domestic hot water loads in order to limit the impact on the well field.

Changes to well design such as increases to the depth of each well will increase the capacity per well but will increase the cost per linear foot of well so while the total well quantity would be limited, the overall cost of the well field would increase. Therefore, this is not a recommended approach to providing additional capacity or redundancy.

Other Net Zero Energy Definitions

- *Department of Energy*: In September 2015 the US Department of Energy released their own guidelines for net zero energy buildings. They have chosen to define NZE as an energy efficient building where on a ***source*** energy basis, the actual annual delivered energy is less than or equal to the ***on-site*** renewable exported energy. They also recommend using the term "Zero Energy Buildings" rather than net zero energy because they feel this is a less confusing naming convention.

  This is an important development as up until this time, almost all net zero projects have accounted for energy use at the site. Accounting for energy at the source can influence decisions about the kinds of systems to utilize and can encourage project designers to use systems such as high-efficiency gas-fired condensing boilers that utilize fossil fuels very efficiently.

- *Living Building Challenge Net Zero Energy Certification*: The International Living Future Institute (ILFI) provides third party certification of net zero energy buildings using the energy petal portion of the Living Building Challenge. This requires projects to define energy use at the site, to harvest all renewable energy on-site and to not use any forms of combustion. As discussed with the city, this project may utilize combustion for up to 10 years in which case it will not be able to achieve net zero energy certification from the ILFI. If the project ultimately does not utilize on-site fossil fuel combustion it should be possible to pursue ILFI net zero energy certification provided all other certification requirements are met.

3. STEPS TO NET ZERO ENERGY

The first step toward achieving net zero energy is to first concentrate on reducing the annual energy needs of the building. Once annual building energy use is reduced, the most appropriate and effective renewable energy systems can be applied at the optimum cost and space impact to the project.

An important aspect is the realization that building occupants should be engaged to help with the effort of achieving NZE goals. As energy use associated with heating, cooling, ventilation and lighting are reduced through careful attention to design, the amount of energy attributed to occupants and building users remains constant and increases in importance. Reducing this portion of building energy use requires the active participation of the building occupants.

The typical hierarchy of steps toward NZE starts with passive and low or no cost strategies and integrates technologies and active systems to make up for what the passive strategies alone can't accomplish. The hierarchy of proposed net zero energy strategies are as follows:

- Optimize the building with an emphasis on orientation, massing, materials and envelope.
- Optimize the passive systems with a particular emphasis on daylight harvesting.
- Apply efficient and effective active systems paying particular attention to transport energy and other parasitic energy use.
- Engage building occupants and users where possible to limit their impact on building energy use and to enlist them in helping achieve the net zero operations goal.
- Apply appropriate renewable energy systems within the building footprint and if necessary, on the building site to harvest the required renewable energy to off-set annual energy needs.

4. ENERGY PERFORMANCE TARGETS

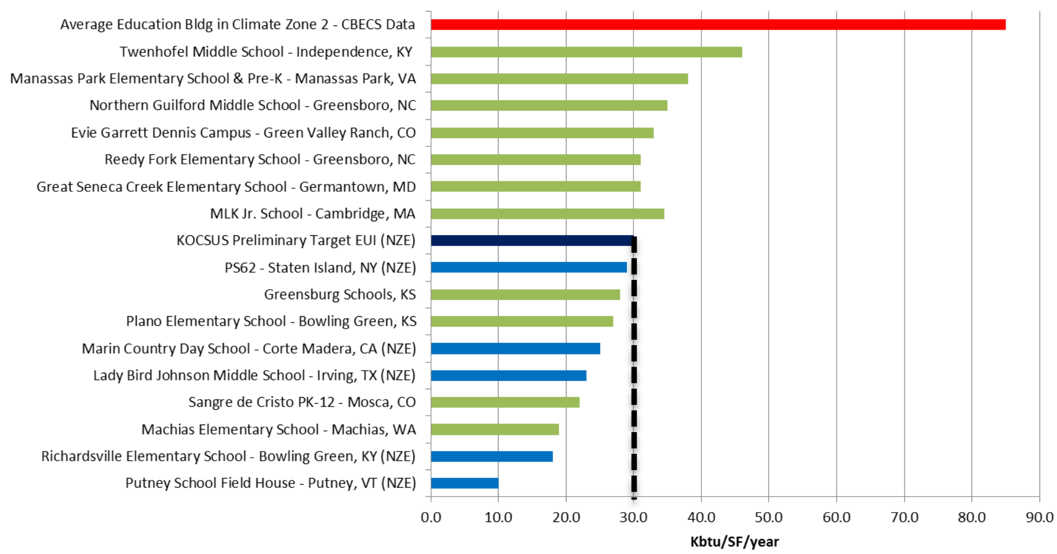
Benchmarking Comparisons

Projecting annual energy requirements for a NZE building with a degree of accuracy requires a very in depth process of investigating and researching the likely energy use in the building and then modeling the building using energy modeling software to factor in the operation of building systems in response to internal loads, building use and climate.

At the preliminary stages of a project it is possible to approximate the likely energy use by benchmarking against other similar buildings with known annual energy use. Annual energy use is typically expressed as energy use intensity (EUI) measured in thousands of Btu per square foot per year (kBtu/sf/year) so that the energy use of various buildings can be compared directly.

Based on information gathered on other NZE school buildings, we believe an energy target of 30 kBtu/sf/year is appropriate for a school like King Open/Cambridge Street Upper School. This target has been arrived at by benchmarking performance against various NZE buildings including several schools.

Comparison of High Performance Schools – EUI in kbtu/sf/year:



5. ANNUAL ENERGY NEEDS

Conceptual Energy Model

A conceptual energy model has been developed for the King Open and Cambridge Street Upper School (KOCSUS) project in Cambridge, MA. The purpose of the energy model is to gain a preliminary understanding of likely annual energy performance relative to the Net Zero Energy goals and to compare several design alternatives.

Energy Model Methodology

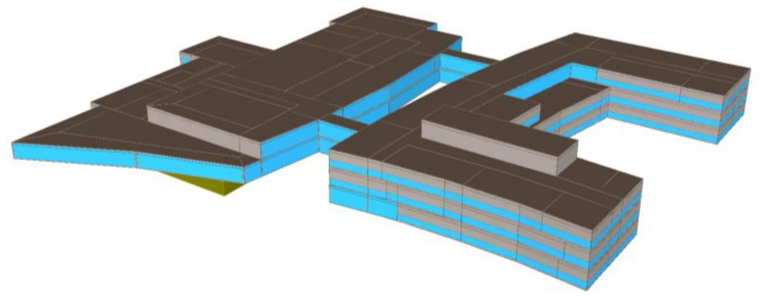
Annual energy use for the project was analyzed using the eQUEST energy modeling software tool. The eQUEST energy modeling tool calculates annual energy use for a building based on typical year weather data and hourly calculations for 8,760 hours per year. At the conceptual level, the energy model is best used for making relative comparisons of the energy performance for different design alternates.

Net Zero Energy requires that buildings operate within set energy budgets based on the amount of renewable energy harvested in a given year. In order to predict annual energy use for these projects a very detailed energy model is required. In order to provide as close an approximation as possible of annual use at the conceptual level, every effort has been made to include detailed information, where available, about likely schedules of building use, occupancy and internal equipment loads as these factors have a major impact on annual energy use in buildings.

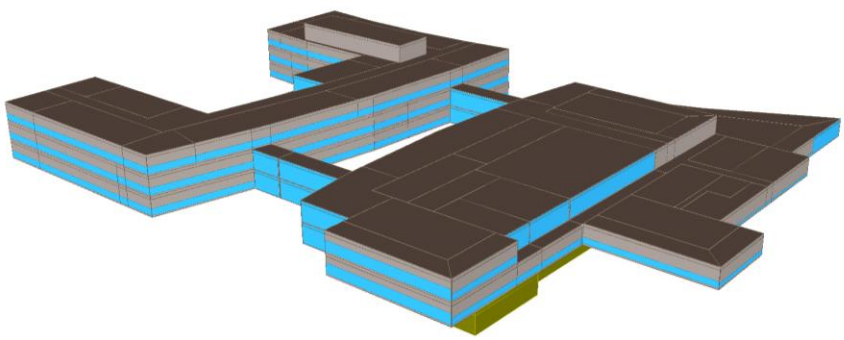
Detailed information regarding the scheduled use and internal loads for the King Open and Cambridge Street Schools was based on similar information developed for the MLK, Jr. Net Zero Energy School in Cambridge as that project has a very similar program and use.

Energy model inputs for building geometry were derived from the conceptual Revit model for Scheme 2 and inputs for building construction were based on guidance provided by the architect on building envelope thermal performance and gross window-to-wall percentages for each façade. Separate models were developed for each mechanical system option based on the MEP system narratives. Where specific information was not available, assumptions were made based on previous experience with high performance school projects. Assumptions made are listed as such in Energy Model Report attached as an appendix to this report.

Energy Model Images



Northwest Corner View



Southeast Corner View

Energy Modeling Disclaimer

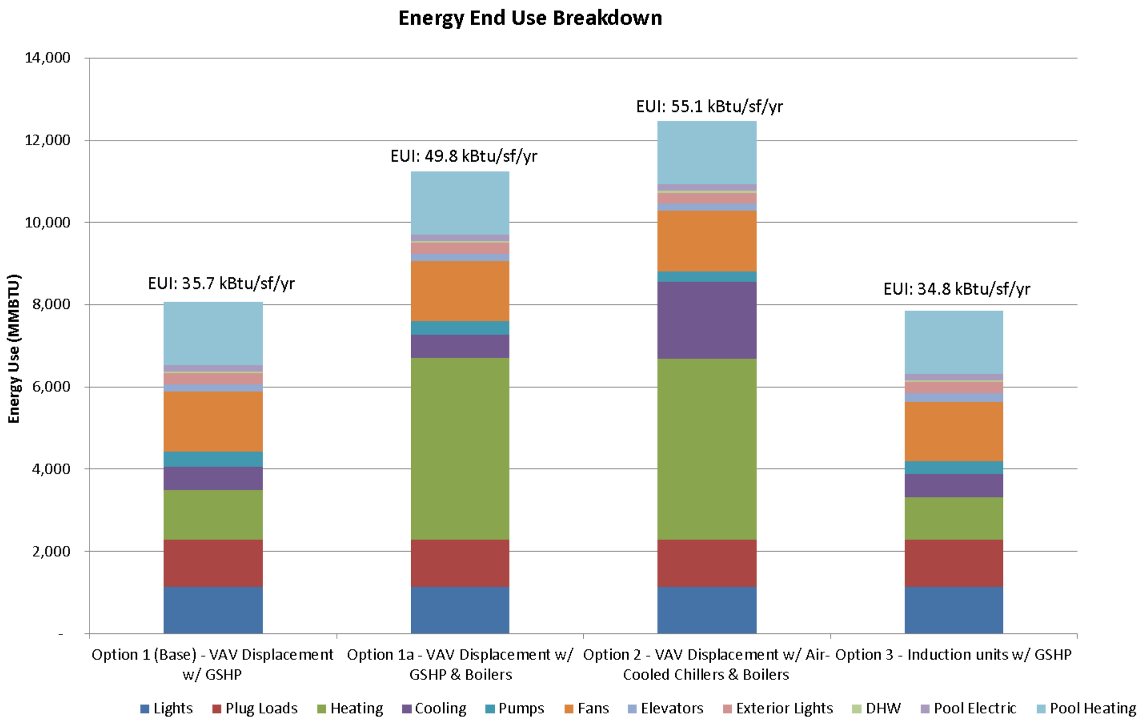
Building energy modeling is a comparative tool used for understanding the relative impact of alternate strategies and systems on annual energy use and cost. Energy modeling is not an absolute predictor of actual energy use or cost and shall not be relied on to predict actual building performance. Changes in construction, variable weather conditions, operational characteristics, end-user input, miscellaneous electrical and gas loads, controls alterations and other unpredictable metrics prevent energy models from predicting the actual annual energy consumption of any facility.

Mechanical System Options

In addition to providing a projection for likely annual energy use for the project, the energy model was used to analyze annual energy use differences for various HVAC system options. A summary of the HVAC system options that have been modeled are noted below along with the annual energy use, energy use intensity (EUI) and annual energy costs for each option:

Annual Energy Use Summary			
Mechanical System Options	**Annual Site Energy Use (MMBTU)**	**EUI* (kBtu/sf/yr)**	**Annual Cost ($)**
Option 1 – VAV Displacement w/ GSHP VAV displacement with Chilled Beams in Admin Areas and High-Efficiency Geothermal Water-to-Water Source Chilled Water and Hot Water Plant	8,063	35.7	$299,878
Option 1a – VAV Displacement w/ GSHP & Boilers VAV displacement with Chilled Beams in Admin Areas and High-Efficiency Geothermal Water-to-Water Source Chilled Water, and High-Efficiency Gas-Fired Condensing Boilers	11,243	49.8	$271,306
Option 2: VAV Displacement w/ Air-Cooled Chillers & Boilers VAV displacement with Chilled Beams in Admin Areas and High-Efficiency Air-Cooled Chiller Plant and High-Efficiency Gas-Fired Condensing Boilers	12,462	55.1	$321,116
Option 3: Displacement Induction Units w/ GSHP Displacement Induction Unit Systems with High-Efficiency Geothermal Water-to-Water Source Chilled Water and Hot Water Plant	7,853	34.8	$290,375

The following table summarized the energy end-use breakdown for the major energy uses in the building for each mechanical system option. Energy for non-mechanical system end uses such as lighting and plug loads are consistent for each option. Variations between options are primarily related to the relative efficiency of providing heating and cooling with each option.



Energy Conservation Measures (ECMs)

The base energy model inputs included several energy conservation measures (ECMs) that are typically found in high-performance schools pursuing net zero energy operation including high efficiency lighting systems, daylight harvesting, demand control ventilation and energy recovery. Therefore, the base model is for a building design that is already optimized for energy performance in many key areas.

Additional ECMs were analyzed for their contribution to energy performance. These included the following:

- Solar thermal heating for domestic hot water loads
- Solar thermal heating for pool water heating
- External solar shading on south facing glass
- Reducing glass areas by 10%
- Improved double-pane glass
- Triple-pane glass

All of the ECMs analyzed resulted in reduced energy use with the solar thermal pool heating ECM having the biggest impact. As the project progresses into the design phases, further analysis of strategies to reduce annual energy use will be explored and analyzed in order to reduce overall building energy requirements.

Impact of Solar Thermal on Pool Energy

Solar thermal heating is a viable option for heating the outdoor swimming pool (see section below on renewable energy). If solar thermal is used to provide all pool water heating, the swimming pool energy requirement is reduced to electrical loads only for pumps, lighting and miscellaneous power. The total pool energy requirement drops from 1687 MMBTU to 148 MMBTU.

Based on project constraints, we recommend that solar thermal be utilized for all pool heating in order to limit the impact of the pool on the overall net zero energy goal. This approach means that no back-up heating system would be provided and the pool water temperature would only be maintained with available solar energy. While the solar thermal system required to provide the pool heating is technically part of the renewable energy system for the project, it is not included in the analysis of renewable energy systems in the remainder of this report.

Impact of Administrative Office

The energy model results do not include the proposed 22,000 square foot administrative wing. If this area is added to the project, the annual energy use for option 1 increases by about 660 MMBTU for a total of 8723 MMBTU and an overall EUI of approximately 35.2 kBtu/sf/yr. This is based on a projected energy use (EUI) for this space of 30 kBtu/sf/yr.

Annual Energy Use by Building Use Group

The following charts identify the energy end-use breakdown separately for school, library, administration and pool use types for various options depending on whether or not the administrative space is included in the project and also depending on whether the pool heating is assumed to be handled by solar thermal and therefore not included in the annual energy calculation.

The charts show annual energy use for each space type as well as the EUI for the individual uses. EUI is expressed as kBtu/sf/yr. For the EUI calculations underground parking areas are excluded from the school area but the energy use is accounted for. The total EUI is presented in two formats – with and without the pool area. The EUI without the pool area is consistent with the energy model report format.

Chart 1: All loads including pool heating with administrative space

End Use	MBTU/Yr	EUI	kWh/Year	% of Total	w/ 20% Contingency kWh/Year
School energy use	6097	28.0	1,786,405	69.9%	2,143,686
Library energy use	279	32.7	81,746	3.2%	98,096
Pool energy use (open pool w/ heat load)	1687	350.4	494,287	19.3%	593,144
Administration (EUI Assumed as 30)	660	30.0	193,378	7.6%	232,054
Total	8723	34.5	2,555,816		3,066,979
		35.2	(w/o pool square footage)		

Chart 2: Pool electrical loads only with administrative space

End Use	MBTU/Yr	EUI	kWh/Year	% of Total	w/ 20 % Contingency kWh/Year
School energy use	6097	28.0	1,786,405	84.9%	2,143,686
Library energy use	279	32.7	81,746	3.9%	98,096
Pool energy use (open pool w/o heat load)	148	30.7	43,364	2.1%	52,036
Administration (EUI Assumed as 30)	660	30.0	193,378	9.2%	232,054
Total	7184	28.4	2,104,893		2,525,872
		29	(w/o pool square footage)		

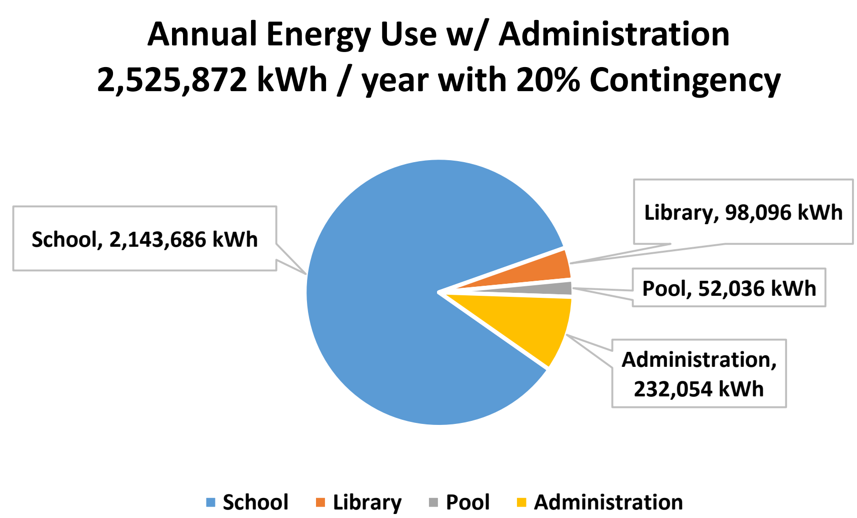
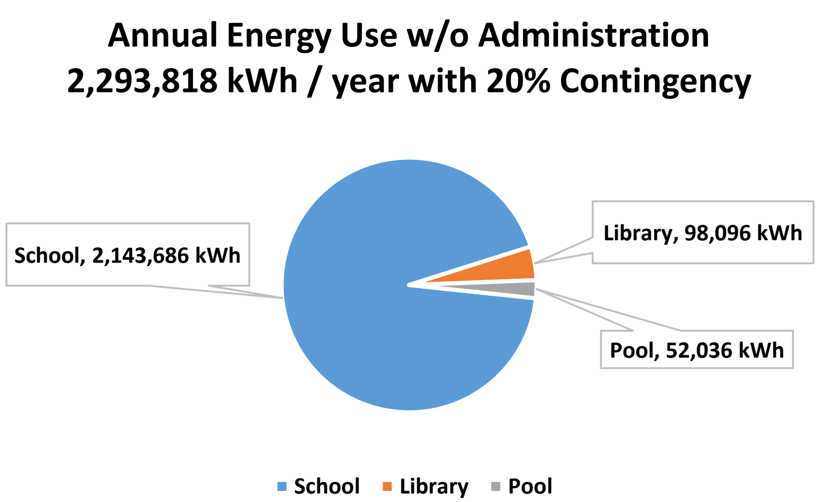


Chart 3: All loads including pool heating without administrative space

End Use	MBTU/Yr	EUI	kWh/Year	% of Total	w/ 20% Contingency kWh/Year
School energy use	6097	28.0	1,786,405	75.6%	2,143,686
Library energy use	279	32.7	81,746	3.5%	98,096
Pool energy use (open pool)	1687	350.4	494,287	20.9%	593,144
Total	8063	34.9	2,362,438		2,834,925
		35.7	(w/o pool square footage)		

Chart 4: Pool electrical loads only without administrative space

End Use	MBTU/Yr	EUI	kWh/Year	% of Total	w/ 20% Contingency kWh/Year
School energy use	6097	28.0	1,786,405	93.5%	2,143,686
Library energy use	279	32.7	81,746	4.3%	98,096
Pool energy use (open pool w/o heat load)	148	30.7	43,364	2.3%	52,036
Total	6524	28.3	1,911,515		2,293,818
		28.9	(w/o pool square footage)		



6. ANNUAL RENEWABLE ENERGY GENERATION

Renewable Energy Options On-Site

The majority of NZE buildings utilize photovoltaic (PV) panels or solar panels to generate electricity from the sun. PV is typically used because good solar resources are available at most building sites. Reliable and consistent wind energy is less likely to be found at building sites, particularly in urban areas. In NZE buildings, the amount of renewable energy that can be harvested on an annual basis depends on the building location, the efficiency of the PV panel used and the mounting angle and orientation of the panels.

PV Array Mounting

Generally, the goal for NZE buildings is to harvest as much energy on an annual basis from each square foot of available roof area or other mounting areas. The most efficient way to accomplish this is with PV panels that are mounted in a contiguous array with panels butted up against one another. This mounting maximizes the energy generated per square foot of area because more panels can be fit into a given area than if they are tilted at an angle and mounted in rows. This is due to the spacing that is required between rows of PV mounted at an angle in order to prevent shading of one row by the row in front of it.

Individual Row Mounting

Contiguous Panels Mounted on Structure above Roof

In order to maximize renewable energy generation within the available area, the PV array will need to be supported on an independent structural support systems that "flies over" the building roof and allows for the maximum amount of PV to be installed within a given area.

Potential PV System Energy Generation – Roof Mounted

The potential for PV system generation on the building roof depends on a number of factors. One of the most important factors is the impact of shading from adjacent building and trees as well as from the building itself. When mounting PV panels on roof surfaces, elevated areas of the roof for mechanical penthouses and elevator equipment spaces or variations in roof elevations can cast shadows that limit the available output of PV system and render some areas of the roof unusable for PV.

When mounting PV arrays on available roof areas there is also a loss factor due to the fixed dimensions of the panels, the fixed dimension of the roof and the need to provide access pathways and other accommodations. For a building with a single contiguous roof surface, these losses are limited. The current KOCSUS design has multiple roof levels and areas and therefore will have a higher loss factor. It is estimated that only 70-75% of the available roof area could be covered with PV panels.

Roof Mounted PV Energy Generation Potential

			% NZE Goal	
Array Type		**kWh/yr**	**w/o Admin**	**w/ Admin**
Individual Rows	Full Roof - No Shading	1,471,802	64.2%	58.3%
	Derated for Shading (w/o Admin)	1,370,056	59.7%	54.2%
	Derated for Shading (w/ Admin)	1,170,098	51.0%	46.3%
Contiguous Array	Full Roof - No Shading	1,736,464	75.7%	68.7%

Mounting PV panels directly on roof surfaces will not provide enough renewable energy on an annual basis to meet the NZE goals for the project.

PV System Area Requirements – Contiguous Array vs Individual Rows

As noted above, mounting PV panels in individual rows may optimize the system first cost but does not maximize the amount of renewable energy that can be harvested within a given area. Mounting the PV panels butted together in contiguous flat arrays results in the most energy production for a given area but will not generate enough energy if only mounted on proposed roof surfaces.

For this study, PV mounting in individual rows as well as mounting in contiguous arrays has been studied. In both cases, a tilt of 5 degrees from horizontal has been assumed in order to more readily promote clearing of snow build-up. In addition, two different panel efficiencies have been considered – 16.5% (market PV) and 22.8% (most efficient PV). Area requirements for the two panel mounting options and efficiencies are as follows:

Annual Energy Requirement (with 20% contingency)		Array Size	Area Required (SF)			
			Most Efficient PV		Market PV	
			Contiguous	Rows	Contiguous	Rows
w/o Administration	2,293,818 kWh	2099 kW	118,430	154,400	132,800	173,300
w/ Administration	2,525,872 kWh	2311 kW	130,390	170,000	146,200	190,875

Contingency

A number of factors outside the control of the design team, owner and building occupants can affect the amount of annual building energy use and annual renewable energy production. These include variations in weather (including higher than normal levels of cloud cover or precipitation), equipment failures, changes in building occupancy and schedule, variations in solar insolation and any number of other factors that impact annual energy use. A contingency factor is one way of accounting for these unknowns by providing slightly more renewable energy system capacity than required by the calculated load. This cushion allows the building to still achieve net zero energy even when energy use is higher than predicted or renewable energy production is lower than predicted.

There is no standard for the application of contingency factors in net zero energy projects. Based on historical parametric analysis on the impact of changing the variables impacting annual energy use and production, a contingency in the order of 20% is warranted in order to size renewable energy systems to meet building energy needs. All calculations for required renewable energy system capacity in this report include the 20% contingency.

PV Panel Efficiency

There is no standard for PV panel size or output. Performance and dimensions vary by manufacturer. The use of panels that are more efficient at converting solar energy into electricity requires less square footage for a given energy output. Panel efficiencies have been improving on a regular basis and it is anticipated that performance will improve by the time the PV system needs to be purchased for the project. At the current time, readily available PV panels from multiple manufacturers are available at efficiencies of around 16.5%. One of the most efficient panels at the present time has an efficiency of 22.8% but is only available from one manufacturer. This panel has been installed on the MLK School in Cambridge. By the time the PV system is purchased it is likely that there will be multiple manufacturers offering panels with this efficiency. It is reasonable to assume that a panel with at least 22.8% efficiency can be utilized for the KOCSUS project.

Solar Thermal

Solar thermal is a viable option for renewable energy at the site. The use of solar thermal is particularly well suited to open swimming pools are there is a good match between the months of peak system output (summer) and the months when the heating is required. This allows a relatively small system to handle the majority of heating loads. For the purpose of this feasibility, it is assumed that the open swimming pool heating will be provided by a solar thermal system. Only electrical loads for system pumps will be included in the renewable energy analysis.

7. NET ZERO ENERGY FEASIBILITY - CONCLUSIONS

Achieving the net zero energy goal for the KOCSUS project will not be possible unless significant effort goes into reducing annual energy needs and increasing annual renewable energy generation. While this will not be easy, it is possible for the site and program.

In order to achieve the NZE goal, large areas of PV will be required. Based on current energy projections, the area of PV required is approximately as large as the total building footprint and will have a significant impact on the project budget as well as an overwhelming impact on the appearance of the building. Integrating such a large array into the project will be a challenge and therefore it is important to take steps to reduce the size of the array as much as possible.

Steps Forward for Achieving Net Zero Energy for KOCSUS

Achievement of the net zero energy goal will require strategies and approaches to both reduce the annual energy required for the project as well as increase the amount of renewable energy that can be generated on site. Additional strategies that could be employed are strategies that define the net zero goal more narrowly by limiting the portion of the project that is considered net-zero energy.

Reducing Energy Requirements – There are many potential strategies that should be investigated as the design progresses in order to reduce the annual energy needs for the project. They include, but are not limited to the following:

- Design Strategies
    - Improve building envelope thermal performance through improved insulation, improve glass performance or a combination.
    - Reduce glass areas on the building
    - Investigate expanded thermal comfort zones for non-critical areas.
    - Optimize the building glass areas, glass locations, ceiling and room designs and lighting controls in order to maximize daylight harvesting potential.
    - Reduce lighting energy through aggressive use of LEDs and controls.
    - Utilize natural ventilation (mixed-mode where and when possible)
    - Limit energy use for food service through menu redesign and aggressive strategies to reduce the amount of food service equipment.
    - Aggressively focus on transport energy used for HVAC systems.
    - Aggressively target equipment energy use on secondary systems such as security, IT, A/V, auditorium lighting and other energy using systems.

- Occupant Engagement Strategies
    - Provide enhanced metering and dashboard systems to enable better decisions about how and when energy is used and to create the opportunity for changes to behavior about energy use.
    - Engage occupants and users in the NZE goal and educate them on how their actions and behavior will impact energy use.
    - Reduce the amount of non-essential equipment used in the building
    - Work with users to develop approaches to building operations that meet their needs, provide flexibility and do not diminish overall comfort.

Increasing Renewable Energy Generation – Strategies to increase the amount of renewable energy that can be harvested on site include, but are not limited to the following:

- Delay purchase of the PV system until later in the construction process to take advantage of improvements in PV efficiency over time.
- Purchase the PV system based on maximum annual energy generation in a given site area instead of lowest bid price.
- Utilize large contiguous areas of PV to maximize generation for a given area.
- Utilize PV supported on independent structures, either over the building or on site, in order to create large contiguous PV arrays.

Redefining Net Zero Energy – Consider limiting or narrowing the definition of what parts of the project are to be net zero energy or change the basis for how energy is accounted for on the project. While these approaches will reduce the amount of renewable energy required they will also complicate energy accounting, dilute the clarity of the message about net zero energy and limit the impact of the goal. *These strategies should not be incorporated into the project without serious consideration of the ramifications*. Potential ideas include the following:

- Evaluate the use of source energy accounting for net zero energy instead of the more commonly used site energy accounting. This approach, coupled with more use of natural gas for heating may reduce the amount of renewable energy needed.
- Exclude the community pool from the net zero energy goal and operation.
- If the administrative office are included in the project exclude them from the on-site net zero energy goal and operation but purchase solar renewable energy credits to offset their energy use.
- Exclude community uses in the school from the net zero energy goal and only include energy used for the normal school day

Achievement of the net zero energy goal will require a concerted effort by all stakeholders. It cannot be achieved by the design team alone and will require the involvement and participation of all stakeholders.

APPENDIX: Draft Conceptual Energy Model Report
November 3, 2015

DRAFT – Conceptual Energy Model Report

King Open and Cambridge Street Upper School

City of Cambridge

Cambridge, Massachusetts

November 3, 2015

IP Project No. G150002-000

in:posse

reinventing human habitats

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1. EXECUTIVE SUMMARY

A conceptual energy model has been developed for the King Open and Cambridge Street Upper School (KOCSUS) project in Cambridge, MA. The building will be designed to be Net Zero Energy and is intended to be a show case of sustainability for the City of Cambridge.

The purpose of the energy model is to gain a preliminary understanding of likely annual energy performance relative to the Net Zero Energy goals and to compare several design alternatives.

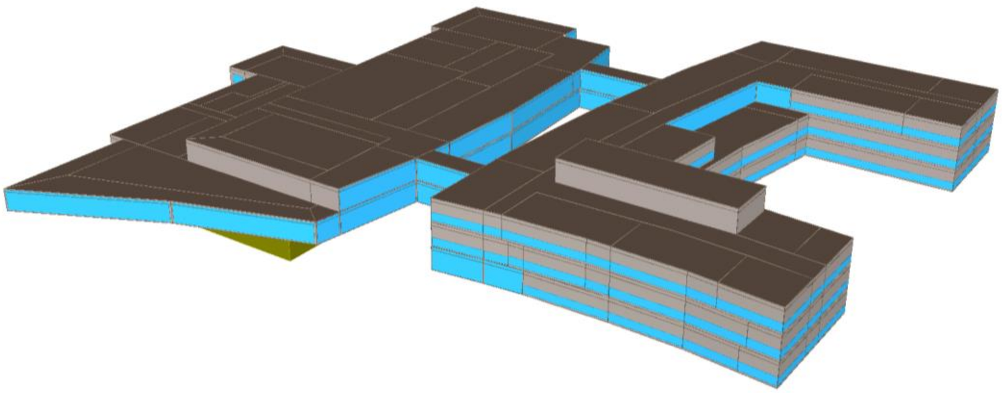
The inputs for this energy model are based on the design concepts and MEP system narratives developed for the project as part of the feasibility study. Detailed information about the building design is not available at this time. In order to provide as detailed an analysis as possible at this preliminary stage, information on operating schedules and internal loads from the MLK, Jr. School project in Cambridge was used as inputs for the school program areas. The MLK, Jr. project is nearing completion and has similar program use as the King Open/Cambridge Street project.

The following table summarizes the annual energy use, energy use intensity (EUI) and cost for the proposed mechanical system design alternatives.

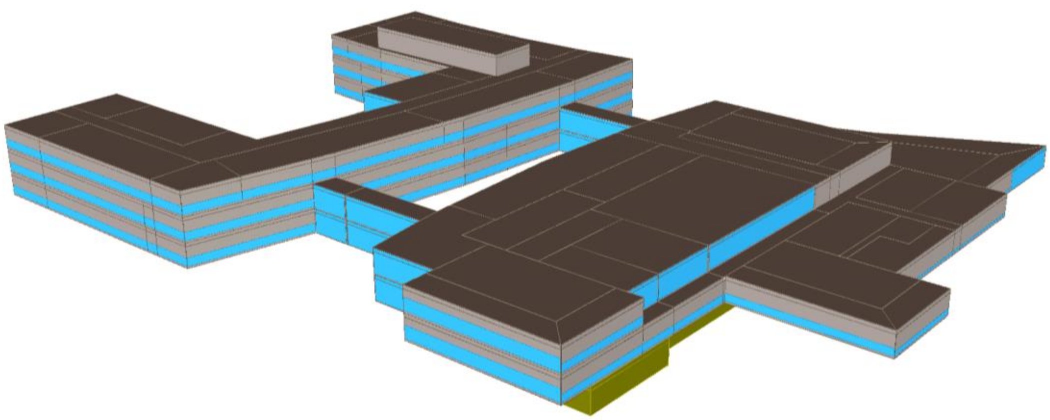
Annual Energy Use Summary			
Mechanical System Options	**Total Site Energy Use (MMBTU)**	**EUI (kBtu/sf)**	**Annual Cost ($)**
Option 1 – VAV Displacement w/ GSHP	8,063	35.7	$ 299,878
Option 1 a– VAV Displacement w/ GSHP & Boilers	11,243	49.8	$ 271,306
Option 2: VAV Displacement w/ Air-Cooled Chillers & Boilers	12,462	55.1	$ 321,116
Option 3: Induction Units w/ GSHP	7,853	34.8	$ 290,375

**Note*: EUI is expressed as kBtu/sf/yr. School area includes School program, MER spaces and Valente Library space. The square footage for the outdoor pool and underground parking garage areas are not used in the EUI calculation, but the energy consumed by them is included.*

Energy Model Images



Northwest Corner View



Southeast Corner View

Energy Modeling Disclaimer

Building energy modeling is a comparative tool used for understanding the relative impact of alternate strategies and systems on annual energy use and cost. Energy modeling is not an absolute predictor of actual energy use or cost and shall not be relied on to predict actual building performance. Changes in construction, variable weather conditions, operational characteristics, end-user input, miscellaneous electrical and gas loads, controls alterations and other unpredictable metrics prevent energy models from predicting the actual annual energy consumption of any facility.

2. ENERGY MODEL RESULTS

General

The project includes the construction of a new building for the King Open Lower School and Cambridge Street Upper School containing classrooms, two gymnasiums, miscellaneous study spaces, a cafeteria, learning commons, administrative spaces and associated support and circulation spaces. Also included in the project is a new facility for the Valente branch of the Cambridge Public Library and a new outdoor swimming pool complex for community use. The project is approximately 262,000 sf in size.

Energy Model Methodology

Annual energy use for the project was analyzed using the eQUEST energy modeling software tool. The eQUEST energy modeling tool calculates annual energy use for a building based on typical year weather data and hourly calculations for 8,760 hours per year. At the conceptual level, the energy model is best used for making relative comparisons of the energy performance for different design alternates.

Net Zero Energy requires that buildings operate within set energy budgets based on the amount of renewable energy harvested in a given year. In order to predict annual energy use for these projects a very detailed energy model is required. In order to provide as close an approximation as possible of annual use at the conceptual level, every effort has been made to include detailed information, where available, about likely schedules of building use, occupancy and internal equipment loads as these factors have a major impact on annual energy use in buildings.

Detailed information regarding the scheduled use and internal loads for the King Open and Cambridge Street Schools is based on similar information developed for the MLK, Jr. Net Zero Energy School in Cambridge as that project has a similar program and use.

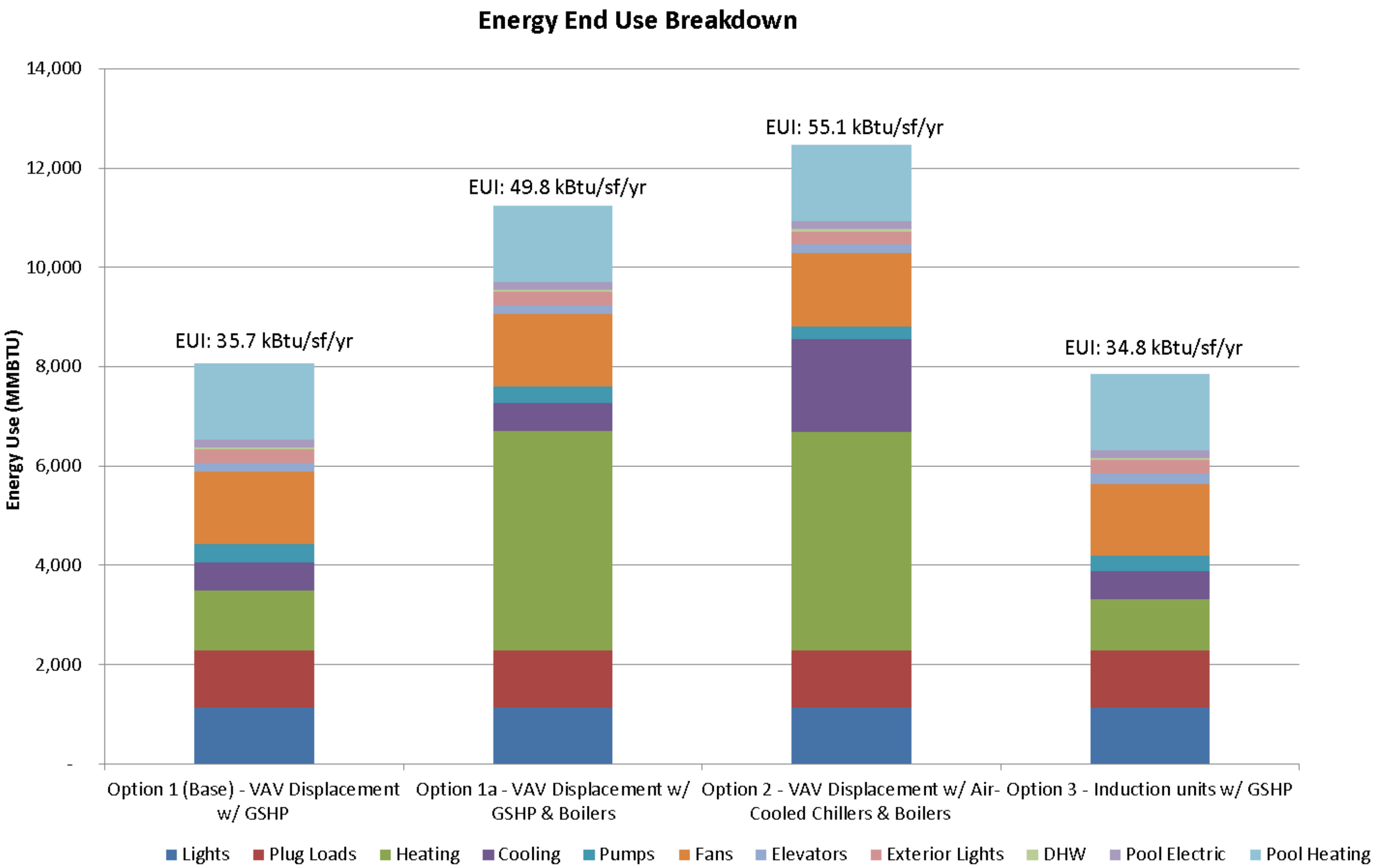
Energy model inputs for building geometry are derived from the conceptual Revit model for Scheme 2 and inputs for building construction are based on guidance provided by the architect on building envelope thermal performance and gross window-to-wall percentages for each façade. Separate models were developed for each mechanical system option based on the MEP system narratives. Where specific information was not available, assumptions were made based on previous experience with high performance school projects. Assumptions made are listed as such in the input section of the report.

Mechanical System Options

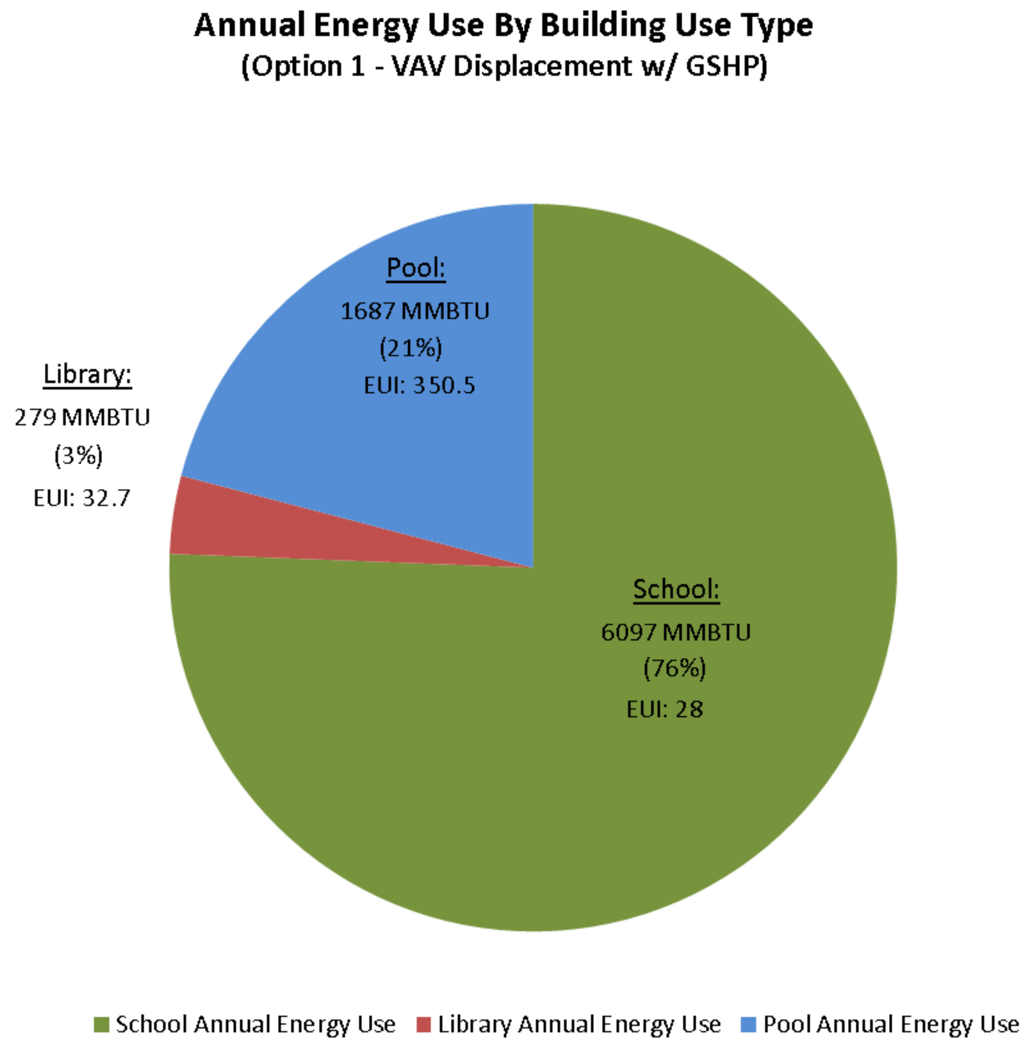
In addition to providing a projection for likely annual energy use for the project, the energy model is being used to analyze annual energy use differences for various HVAC system options. A summary of the HVAC system options that have been modeled are noted below:

Option	Description
Option 1 – VAV Displacement w/ GSHP	• VAV displacement with Chilled Beams in Admin Areas and High-Efficiency Geothermal Water-to-Water Source Chilled Water and Hot Water Plant
Option 1a – VAV Displacement w/ GSHP & Boilers	• VAV displacement with Chilled Beams in Admin Areas and High-Efficiency Geothermal Water-to-Water Source Chilled Water, and High-Efficiency Gas-Fired Condensing Boilers
Option 2: VAV Displacement w/ Air-Cooled Chillers & Boilers	• VAV displacement with Chilled Beams in Admin Areas and High-Efficiency Air-Cooled Chiller Plant and High-Efficiency Gas-Fired Condensing Boilers
Option 3: Induction Units w/ GSHP	• Displacement Induction Unit Systems with High-Efficiency Geothermal Water-to-Water Source Chilled Water and Hot Water Plant

The following table summarized the energy end-use breakdown for the major energy uses in the building for each mechanical system option. Energy for non-mechanical system end uses such as lighting and plug loads are consistent for each option. Variations between options are primarily related to the relative efficiency of providing heating and cooling with each option.



The following table identifies the energy end-use breakdown separately for school, library, and pool use types.



Note:
EUI is expressed as kBtu/sf/yr. School area includes both School program and MER spaces. Library area only includes planned Valente Library space. Outdoor Pool area includes an estimated 4,814 sf. The square footage for the underground parking garage area is not used in the EUI calculation, but the energy consumed by it is included.

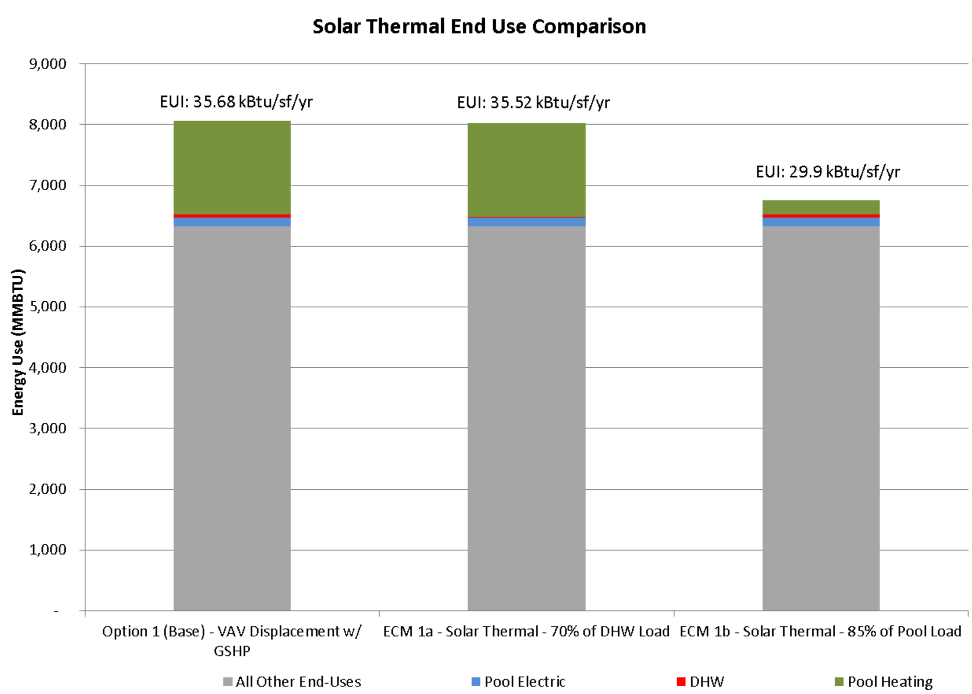
3. ENERGY CONSERVATION MEASURES

The energy model inputs included several high-performance energy saving measures that are typically found in high-performance schools pursuing net zero energy operation including high efficiency lighting systems, daylight harvesting, demand control ventilation and energy recovery. Therefore, the model is for a building design that is already optimized for energy performance in many key areas.

Following the initial modeling runs, some additional strategies that weren't already included were studied to see what impact they would have on the overall energy use for the project. These energy conservation measures or ECMs consisted of utilizing solar thermal energy for domestic hot water heating and pool water heating as well as several ECMs for improved building envelope performance. All ECMs are applied to Option 1.

Solar Thermal ECMs

- ECM 1a - Utilize solar thermal collectors and storage tanks to provide a portion of the domestic hot water used in the facility. The estimated energy savings for this ECM is 70% of the building annual domestic hot water heating energy.
- ECM 1b – Utilize solar thermal collectors and storage tanks to provide a portion of the heating required to maintain the temperature of the outdoor swimming pools. The estimated energy savings for this ECM is 85% of the pool annual pool water heating energy.



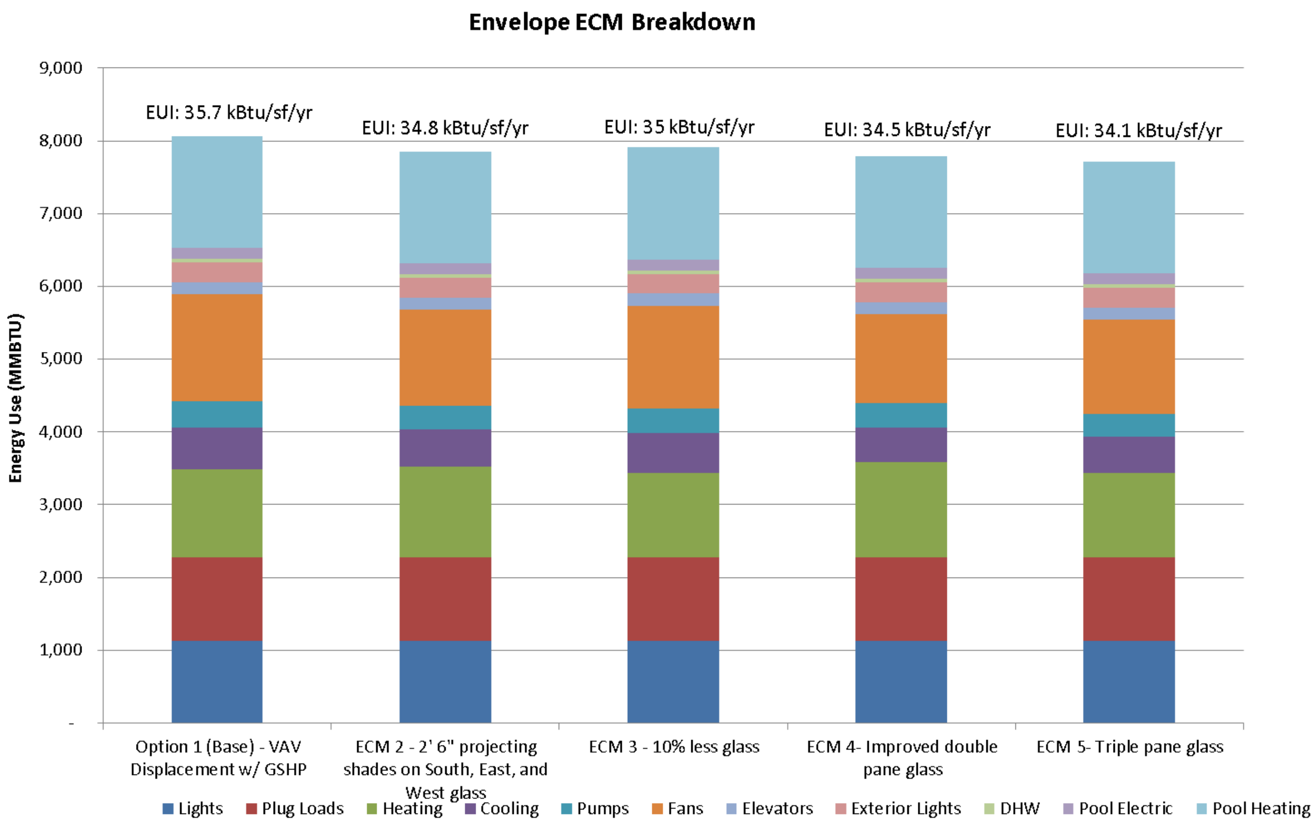
Building Envelope ECMs

- ECM 2 – Exterior Solar Shades – This ECM adds 2'-6" horizontally projections above all east, south and west facing glass for solar shading of higher sun angles.

- ECM 3 – Reduce Glass Area 10% - This ECM reduces overall glass area on the building by 10% from approximately 41% glass to approximately 37% glass. The reduction is applied uniformly across the entire building.

- ECM 4 – Better Double-Pane Glass – This ECM improves the baseline double pane glass SHGC from 0.39 for curtain wall and 0.31 for punched windows to 0.23 for all glass used on the project. The visible light transmittance is decreased from 70% to 60%

- ECM 5 – Triple-Pane Glass – This ECM replaces all glass on the project with triple pane glass with the following performance characteristics:
  - U-assembly: 0.34
  - Glass SHGC: 0.23
  - VLT – 60%



4. ENERGY MODEL INPUTS

Project and Site Information

Weather	TMY3 - Boston – Logan Int'l Airport
Orientation	Plan North = North

Utility Rate Structure

Electricity	NSTAR Rate: Monthly customer charge of $7.32 plus $0.0978 per kWh. Energy distribution charge for first 10kW $10.27 per kW and $13.05 each additional kW.
Natural Gas	NSTAR Rate: Monthly customer charge of $30.55 plus $0.7545 per therm November through April, $0.6367 May through October

Geometry and Architecture

	Proposed Design (all alternatives)
Zoning	Based on concept Revit model (scheme 2), dated July 16, 2015
Gross Area	School – 214,132 sf Library – 8,530 sf Roof MER– 3,302 sf **Total Building – 225,964** Lower Level Parking Garage (area not included in EUI calculations)– 31,311 sf Outdoor Pool (area not included in EUI calculations) – 4,814 sf
Floor to Floor Heights	▪ Classrooms - 14 ft ▪ US Gym – 30 ft ▪ LS Gym – 28 ft ▪ Auditorium – 28 ft

Building Envelope Performance

	Proposed Design (all alternatives)
Window-to-Wall Ratio (Gross wall - floor-to-floor)	~41.5% per SD estimates
Curtainwall Glazing Performance (assembly values)	▪ Curtainwall: ▪ U-assembly: 0.42 ▪ Glass SHGC: 0.39 ▪ VLT – 0.70 ▪ Punched Windows: ▪ U-assembly: 0.28 ▪ Glass SHGC: 0.31 ▪ VLT – 0.7
External Shades	None
Above Grade Walls, Steel Frame	R-25
Sub-grade Walls	U = 0.3
Slab-on-Grade	N/A
Roof – Insulation entirely above deck	R-40 cont. (assumed)
Exposed Floors – Steel Frame	N/A

Civil / Infrastructure Process Loads

	Proposed Design (all alternatives)
Exterior Lighting	18 kW (estimated)
Pool	Based on information from Aquatic Design Group, Inc. dated 2/4/2015: Outdoor pool with heater, assumed to operate between Memorial Day and Labor Day. Recreation Pool: • Electric (assumed, pumps): 96.4 kWh/day • Natural Gas (assumed, heating): 53.4 therms/day Kids Pool: • Electric (assumed, pumps): 314 kWh/day • Natural Gas (assumed, heating): 110.9 therms/day

Internal Electrical Loads

	Proposed Design (all alternatives)
Lighting	▪ General Classroom – 0.52 W/sf ▪ Auditorium – 0.6 W/sf ▪ Pre-K – 0.43 W/sf ▪ Cafeteria – 0.65 W/sf ▪ Kitchen – 1.19 W/sf ▪ US Gym – 0.76 W/sf ▪ LS Gym – 0.63 W/sf ▪ Fitness – 0.79 W/sf ▪ Office – 0.55 W/sf ▪ Restrooms – 0.52 W/sf ▪ Corridor – 0.43 W/sf ▪ Storage – 0.45 W/sf ▪ Mechanical/Electrical – 0.66 W/sf ▪ Parking Garage – 0.2 W/sf
Specialty Lighting	None
Daylighting	▪ Full dimming control, down to full shutoff with no power draw. ▪ General Light target: 30 fc @ 2.5 ft AFF ▪ Gym Light Target: 20 fc @ 0 ft AFF
Lighting Controls	Occupancy Sensors in Classrooms and Offices

Elevators	25 kW total, include regenerative drive (assumed)

Equipment Loads (Includes Diversity)

Equipment (Includes Diversity)	Peak Wattage	Hourly Average
Pre-K	12.5 W/sf	1.13 W/sf
LS Classroom	1.4 W/sf	0.43 W/sf
US Classroom	0.97 W/sf	0.66 W/sf
Learning Commons	1.8 W/sf	0.46 W/sf
Gymnasiums	1.63 W/sf (Events)	0.31 W/sf
Auditorium	1.67 W/sf (Events)	0.28 W/sf
Cafeteria	0.18 W/sf	0.01 W/sf
Kitchen	21 W/sf	10.39 W/sf
Office	3.49 W/sf	1.24 W/sf
Storage	0 W/sf	0 W/sf
Corridor	0.18 W/sf (Cleaning - one hour/day)	0.18 W/sf (Cleaning - one hour/day)
Restrooms	108 W/sf	1.05 W/sf
Mechanical	2.6 W/sf	1.15 W/sf

HVAC

	Option 1 – VAV Displacement w/ GSHP (Opt. 1a with Condensing Boiler heating)	Option 2: VAV Displacement w/ Air-Cooled Chillers & Boilers	Option 3: Induction Units w/ GSHP
Thermostat Setpoints	76 / 70 occupied; 82 / 55 un-occupied; unoccupied mode on all holidays & breaks	Same as Option 1	Same as Option 1
System	VAV displacement with Chilled Beams and DOAS in Admin/Nurse Areas, High-Efficiency Geothermal Water-to-Water Source	VAV displacement with Chilled Beams and DOAS in Admin/Nurse Areas, High-Efficiency Air-Cooled Chiller Plant	Induction Unit Systems and DOAS, High-Efficiency Geothermal Water-to-Water Source Chilled Water and Hot Water Plant.

	Chilled Water and Hot Water Plant	and High-Efficiency Gas-Fired Condensing Boilers	
Radiant Heating	Radiant Heating panels at ceiling in Perimeter Spaces with Glazing	Same as Option 1	Same as Option 1
CHW Source	Ground-Source Heat Pump: COP 4.65 (at peak ground water condition)	Air-Cooled Chiller: COP 2.8	Ground-Source Heat Pump: COP 4.65 (at peak ground water condition)
CHW Temperatures	45°F supply, 12°F delta T	Same as Option 1	Same as Option 1
CHW Flow	Variable Primary with VFD Drives	Same as Option 1	Same as Option 1
CHW Pump	100 ft Head / Premium Efficiency / 30% min Turndown	Same as Option 1	115 ft Head / Premium Efficiency / 30% min Turndown
HW Source	Ground-Source Heat Pump: COP ~2 *(Option 1a; Condensing Boiler, same as Option 2)*	High-Efficiency Condensing Boiler: 93% eff.	Ground-Source Heat Pump: COP ~2
HW Temperatures	130°F supply with 15°F delta T *(Option 1a; 140°F with 30°F delta T, same as option 2)*	140°F supply with 30°F delta T	Same as Option 1
HW Flow	Variable Primary with VFD Drives	Same as Option 1	Same as Option 1
HW Pump	80 ft Head / Premium Efficiency / 30% min Turndown	Same as Option 1	Same as Option 1
CW Source	Geothermal Well Loop	n/a	Geothermal Well Loop
CW Temperatures	10°F Delta T	n/a	Same as Option 1
CW Flow	Variable Primary with VFD Drives	n/a	Same as Option 1

CW Pump	(2) 15-HP Motors, Premium Efficiency	n/a	
Economizer	Dual Enthalpy	Same as Option 1	Same as Option 1
DCV	Sensors in all regularly occupied spaces	Same as Option 1	Same as Option 1
Energy Recovery	Enthalpy Wheel on all Air handlers	Same as Option 1	Same as Option 1

Domestic Hot Water

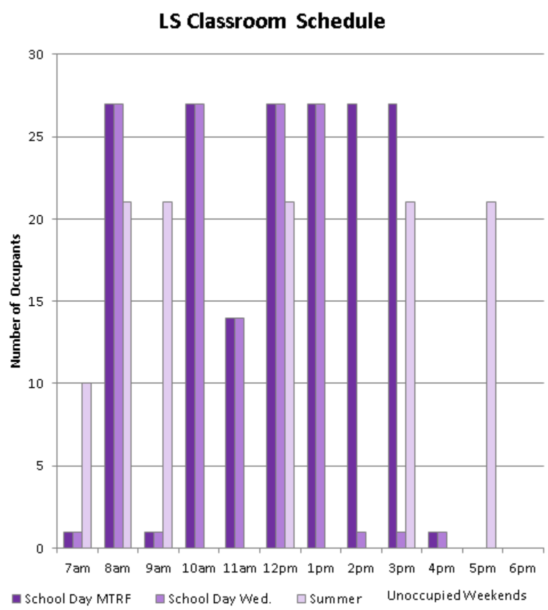
	Proposed Design (all alternatives)
General Usage	Education
Heaters	Electric
Recirc System	n/a

Schedule and Occupancy

Occupancy patterns are assumed to follow the profile in the below charts. For the school programming, occupancy has been assumed to mirror the MLK, Jr. School as developed previously. The Valente Library schedules have been based on operating hours listed on the Library's website. The lighting, equipment, heating and cooling schedules are generally assumed to track the occupant schedule, turning on during periods of occupancy, and turning off during periods of non-occupancy.

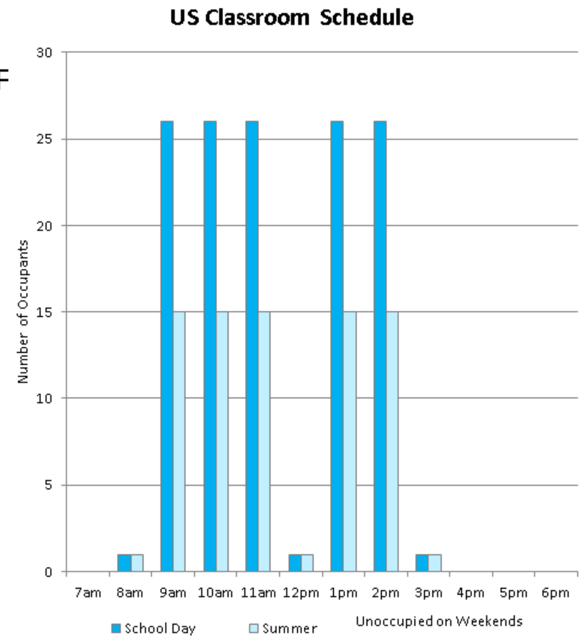
KO Classroom

- General Hours:
  - 7:55am – 3:55pm M,T,R,F
  - 7:55am – 1:55pm Wed.
  - Summer Programs 8am to 5pm but students out of room 50% of time. Only includes 6 classrooms.
- School Year Schedule includes:
  - 30 min lunch (assumed between 11am and 12pm)
  - (1) 45 min out of class period
- No weekend use
- Maximum number of students per room: 25
- Maximum Faculty per room: 2



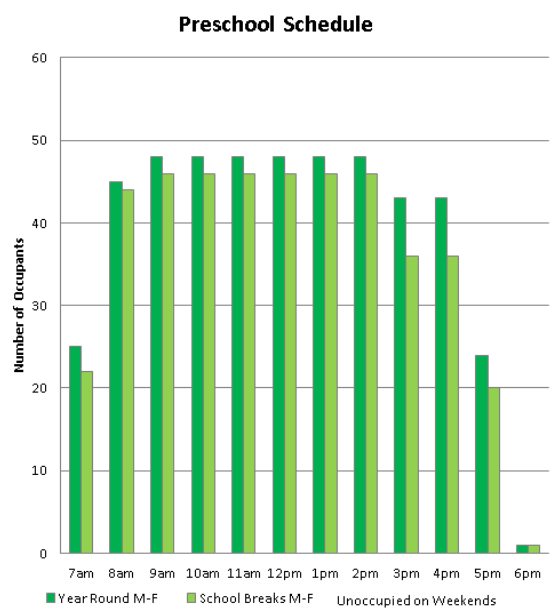
CSUS Classroom

- General Hours:
  - School Year: 8:55am – 2:55pm M-F
  - Summer School: 9am-2pm
    Only includes 6 classrooms
- Schedule includes:
  - 30 min lunch (assumed between 12pm and 1pm)
- No weekend use
- Maximum number of students per room: 25
- Maximum Faculty per room: 1
- Assumes room is in use for all teaching periods during the day.



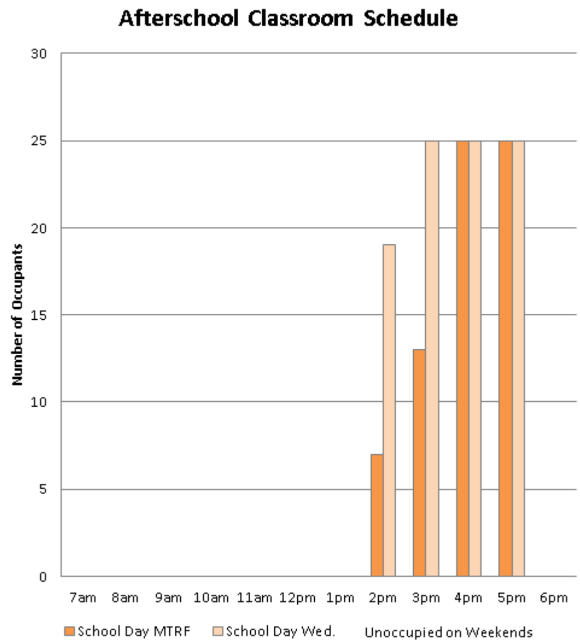
Pre-K Schedule

- General Hours (year round): 7am - 6pm M-F
- Open During School Breaks: 7am - 6pm
- No weekend use
- Maximum number of students: 40
- Maximum staff: 6
  - 2 teachers per room
  - 1 aide, 1 admin
  - Staff overlap from 12-1pm



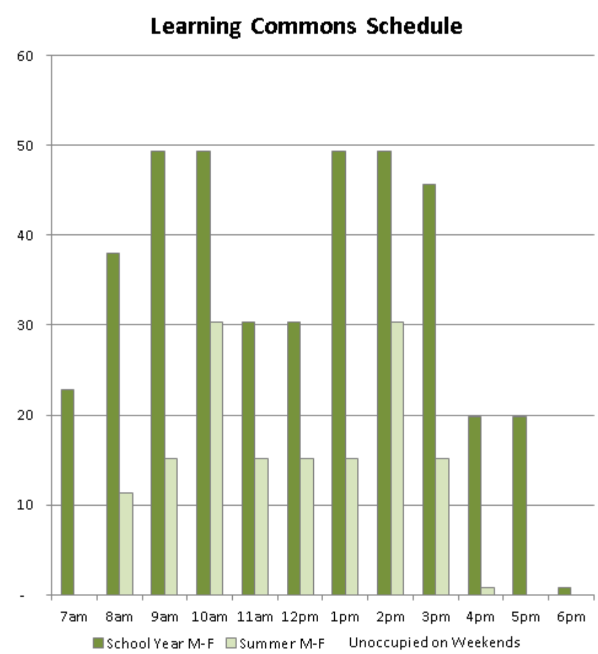
Afterschool Classroom

- General Hours:
  - 2:15pm – 6:00pm M-F
- Schedule includes:
  - Early Arrival by students from other schools
  - Early dismissal of students on Wednesday
- No weekend or summer use
- Maximum number of students per room: 24
- Maximum Faculty per room:1
- Community may use rooms as well, room use would be under community schedule



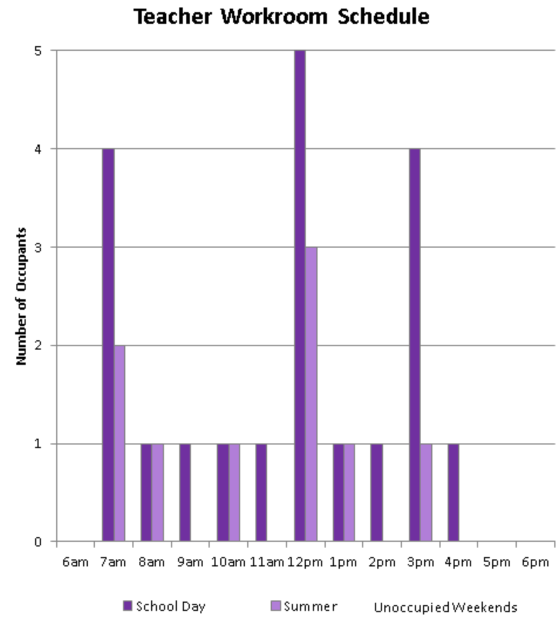
Learning Commons

- General Hours:
  - School Year 7am – 9pm M-F
  - Summer 8am-5pm M-F
- Schedule includes:
  - Early Arrival by upper school students
  - Class groups and other students
  - Summer school and camp use
- No weekend use
- Staff: 2



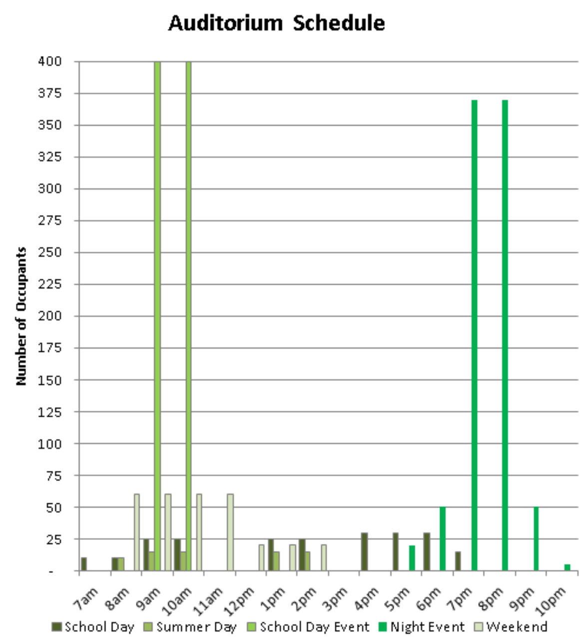
Teacher Workrooms

- General Hours:
  - 7am – 5pm M,T,R,F
  - 7am – 5pm W (shorter school day)
- Schedule includes:
  - Pre Class and Post Class prep
  - Class Prep and Lunch during student lunchtime
- No weekend use
- Maximum number of classrooms per teacher work room: 6
- Maximum Faculty Sharing workroom: 8



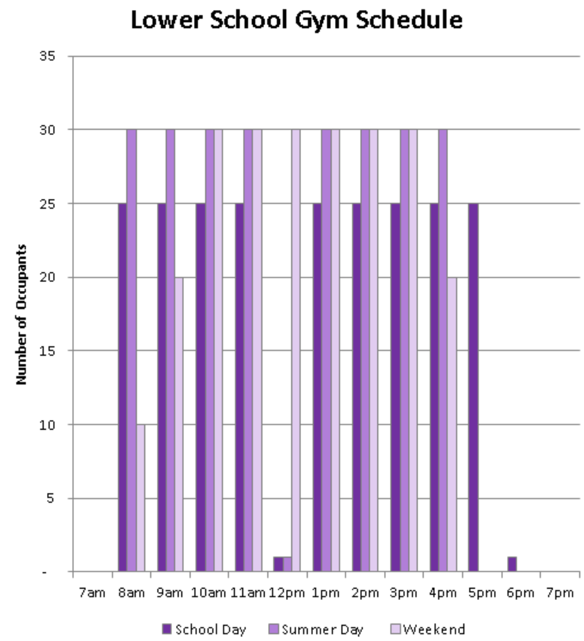
Auditorium

- General Hours:
  - School Year:7am – 8pm M-F
  - Summer: 8am-3pm M-F
  - Weekend: 8am-2pm Sat & Sun
- Schedule includes:
  - Student class during the school day
  - Afterschool usage by afterschool groups and clubs
  - School Assembly Events
  - Evening performances and concerts
- Event use is not daily
  - Daytime Events: Once every two weeks during school year
  - Evening Events: Once every two weeks year round.



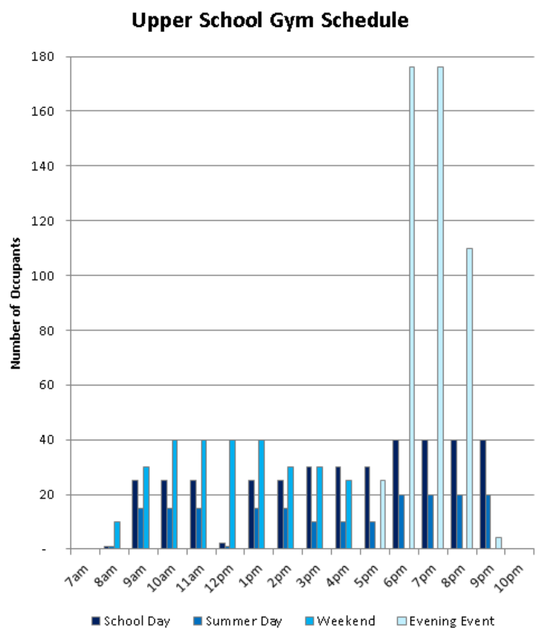
KO Gymnasium

- General Hours:
  - 7:55am – 7:00pm M-F
  - Weekends: 8am-5pm Sat. & Sun.
- Schedule includes:
  - Student class during the school day
  - Afterschool usage by afterschool groups
  - Summer usage will be for camps and other programs



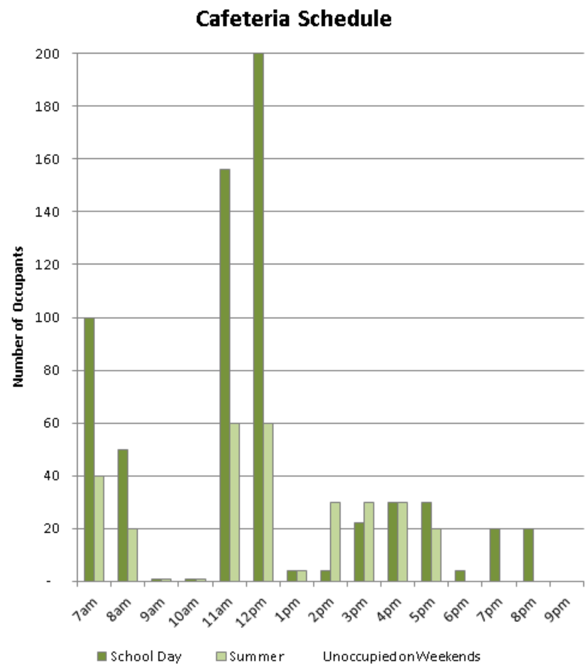
CSUS Gymnasium

- General Hours:
  - 7:55am – 10:00pm M-F
  - Weekends: 8am -5pm Sat & Sun
- Schedule includes:
  - Student class during the school day
  - Afterschool usage by afterschool groups and teams
  - Summer usage will be for camps and other programs



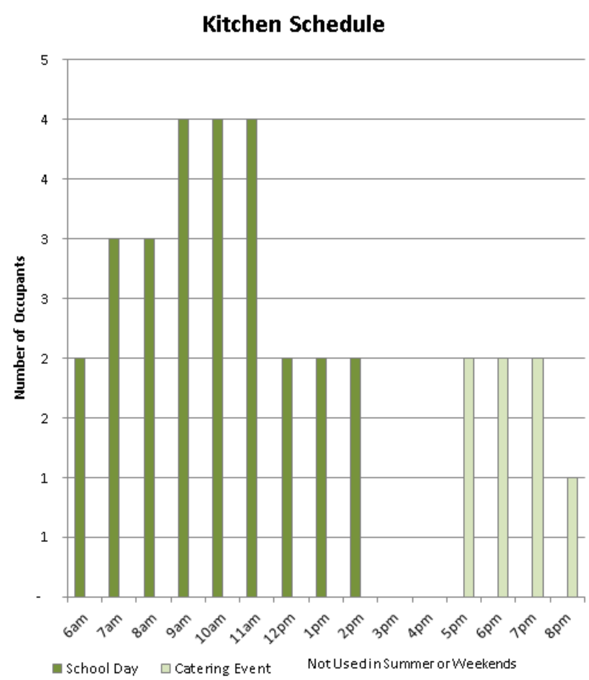
Cafeteria

- General Hours:
  - 7:00am – 9:00pm M-F
- Schedule includes:
  - Early Arrival by students for breakfast
  - Lunch for school students
  - Afterschool program use
- No weekend use
- Max. number of students per lunch period: 200



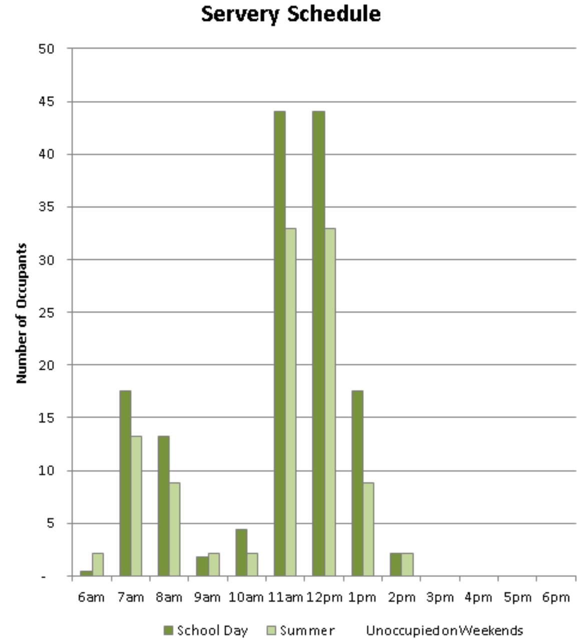
Kitchen

- General Hours:
  - 6:00am – 2:00pm M-F
  - Occasional Catering Events in Evening
- Schedule includes:
  - Prep for Breakfast
  - Prep for Lunch
  - Clean Up
- No weekend use
- No Summer Use
- Maximum number staff: 4
- Catering use is currently for up to four times per year.



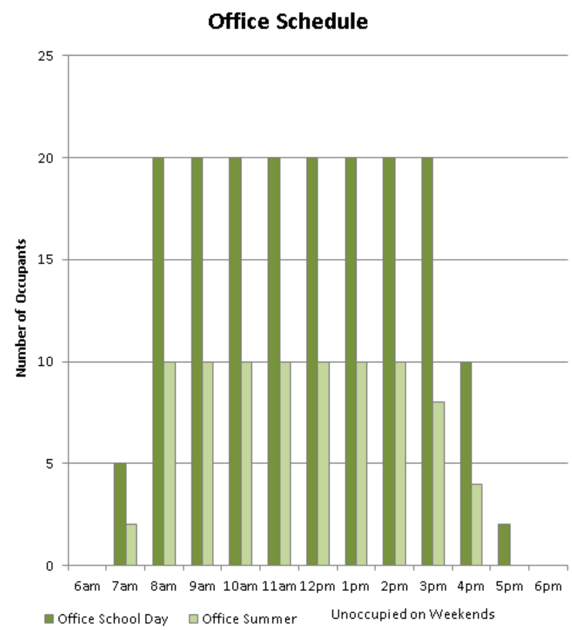
Servery

- General Hours:
  - 6:00am – 2:00pm M-F
- Schedule includes:
  - Breakfast Service For Students
  - Lunch Service For Students
- No weekend use
- Maximum number of students per meal in the room at one time: 40
- Maximum Serving Staff and Cashiers: 4
- Summer meal service will occur even though meals are prepared elsewhere.



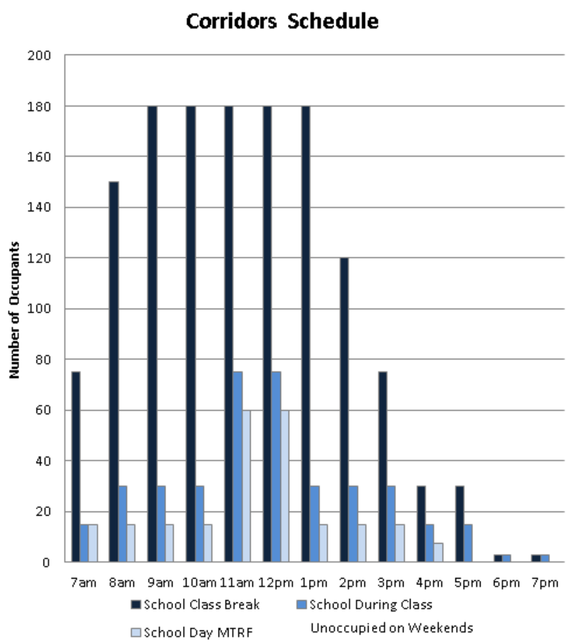
Offices

- General Hours:
  - 7:00pm – 6:00pm M-F
- Schedule includes:
  - Main Office Staff
  - Specialty Support Staff
- No weekend use
- Maximum number of people in all offices: 20



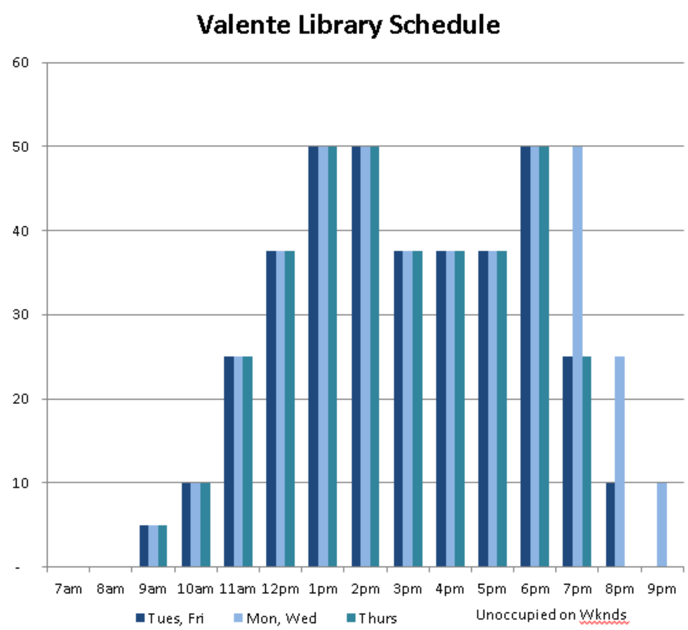
Corridors

- General Hours:
  - 7:00am – 7:00pm M-F
- Schedule includes:
  - Early arrival by teachers
  - Full school day use
  - Afterschool use
  - Afternoon/Evening Cleaning
- No Weekend Use
- Occupancy will vary greatly, schedule reflects average number of people.



Valente Library Schedule

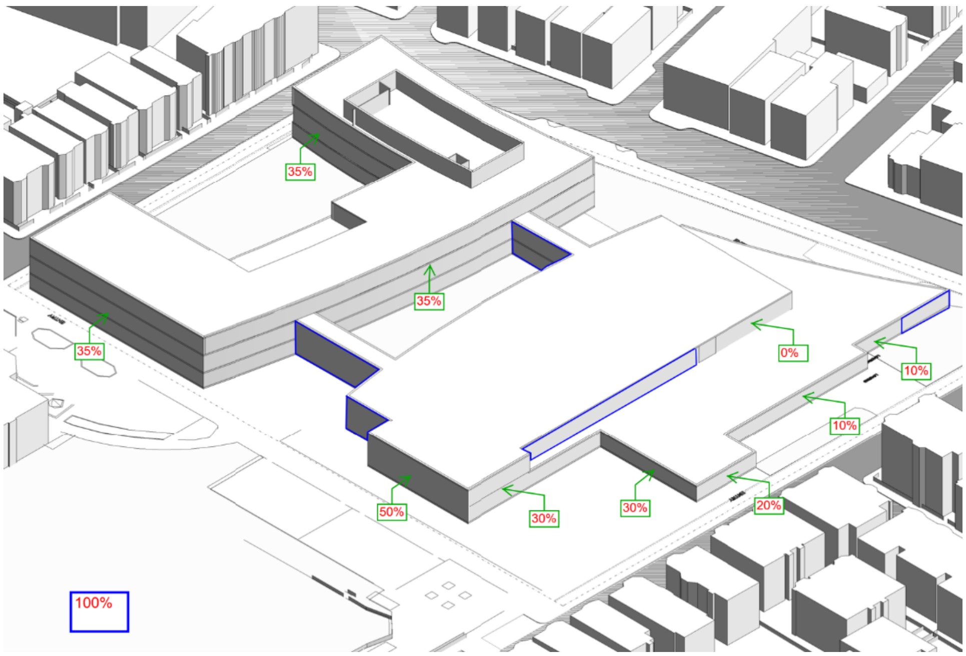
- General Hours:
  - 10am-6pm Tues, Fri
  - 10am-8pm Mon, Wed
  - 10am-5pm Thurs
- No weekend use
- Staff: 5



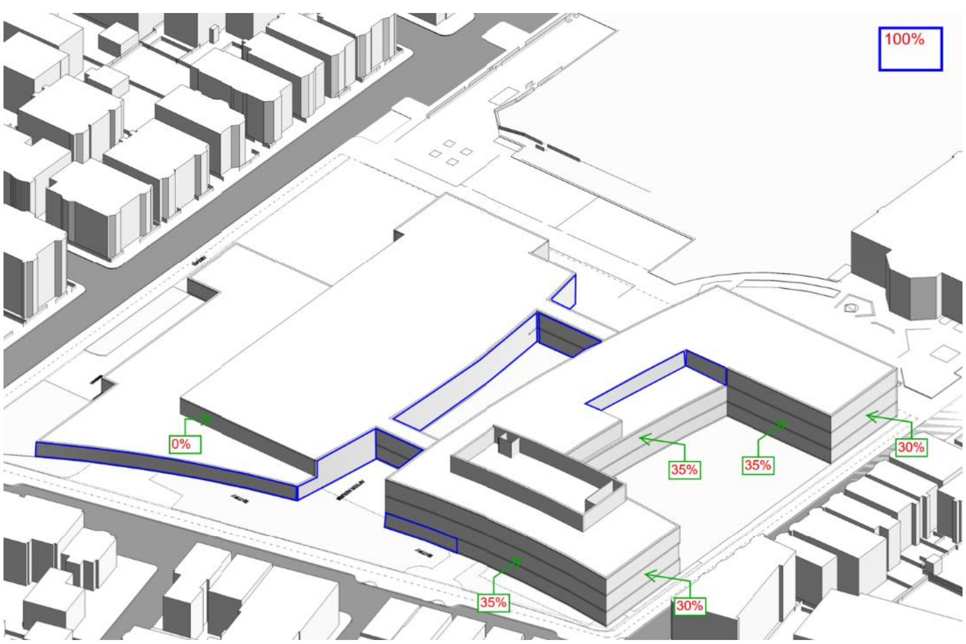
Building Glass Areas

Building glass areas utilized in the energy model are indicated on images below:

North:



South:



City of Cambridge

King Open / Cambridge Street Upper Schools & Community Complex

OWNER'S PROJECT REQUIREMENTS

Stephen Turner Inc.
Building Better Performance

OPR Documentation

Updated: November 2015
Revised: February 2016

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Providence, Rhode Island, 02906
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www.greenbuildingcommissioning.com

Table of Contents

Executive Summary

The Owner's Project Requirements (OPR) effort seeks to document answers to this question: What are the measurable performance criteria that will determine if this project is a success? Through the development of the feasibility study, the project team identified several project goals and requirements that are rooted in one or more of the following key criteria:

1. USGBC LEED Certification – Currently the goal of the City is for the project to target LEED Certification with a minimum of LEED Silver Certification or better.

2. Net Zero Energy Potential – The project team has established the primary project goal of achieving net zero energy and emissions operation. As a result of meetings and discussions held during the feasibility phase, the City has indicated that the KOCSUS project should meet the net zero energy goal for Municipal buildings that was adopted in June of 2015. The ultimate goal of the Net Zero 25-Year Action Plan is for new buildings to achieve the NZE goal without the use of fossil fuels on site. As documented in the InPosse NZE Feasibility Report, in accordance with this Action Plan the City has stated that in addition to the to the KOCSUS NZE goal, the project is to pursue this goal without the use of fossil fuels on site, or by ending any use of on-sit fossil fuels within 10 years.

   As defined by NREL, Net Zero Energy projects can account for energy use using different methods. Since the project is striving to meet the NZE goal without the use of fossil fuels, the project will either account for NZE on an emissions basis, or further guidance on how to account for emissions from different energy sources will have to be developed if fossil fuels are used on site. The revised latest NZE feasibility report dated February 2016, includes specifics to which National Renewable Energy Laboratory (NREL) category is being considered. The InPosse report states that the initial goal for the KOCSUS project is to achieve net zero using classification B. NREL Classification B is for buildings that utilize renewable energy harvested within the building footprint and site. However, the feasibility study also states that due to the building's multiple stories and large size compared to the site, NREL Classification B may not be the best supporting option.

   The energy model report included in the feasibility study developed by *inposse* analyses three different system options being considered and of these options indicates the lowest projected energy use intensity (EUI) at the site to be approximately 35 kbtu/sf/yr. The anticipated offset of the projected annual energy use using on-site renewable energy is currently being review by *inposse;* photovoltaic and solar thermal options and space requirements are being analyzed.

3. Operations and Maintenance Requirements – On the Martin Luther King Jr. School project the City of Cambridge determined critical Operation and Maintenance (O&M requirements, which have been applied to the King Open Cambridge Street Upper School and Community Complex (KOCSUSCC) project. Comprehensive requirements for Operations and Maintenance manuals (O&M), as well as rigorous owner training for all MEP equipment, kitchen equipment and security equipment are requirements of the City's to facilitate the owner's ability to operate and maintain the building. Simplification and standardization of building systems should be considered while not sacrificing system performance or energy efficiency.

Introduction

This Owner's Project Requirements (OPR) has been developed by Stephen Turner Inc. for the City of Cambridge to document the owner's requirements for the King Open Cambridge Street Upper School and Community Complex (KOCSUSCC) as they relate to the commissioning process. The goal of documenting the (OPR) is to summarize the intended project outcomes required by the owner. This document is intended to define the required outcomes for the commissioned systems, and will inform the commissioning process throughout the project.

The OPR communicates the owner's requirements with the goal of aligning the project team's work throughout the project, from the design team's conceptual thinking through actual construction to operating and maintaining the occupied facility after completion. The OPR document is intended as a mutually beneficial tool to the entire project team by documenting key project requirements, supporting an integrated approach to project design and delivery and supporting commissioning evaluation of outcomes in the final built project. The OPR will be used to guide the commissioning process throughout the project, including the first year of operation.

Ultimately, the commissioning process seeks to verify and document that the final built project satisfies all the documented elements of the Owner's Project Requirements. This documentation is a narrative description that describes what the owner views as a successful project, which in turn helps the project team deliver just that - by utilizing this document throughout the commissioning process.

Site Description

The project site is located at 850 Cambridge Street and is adjacent to Donnelly Field. The Donnelly Field is one of Cambridge's largest public parks and the connectivity of the school to this park through access and views is a guiding focus of the design concepts. The existing school is a one and two story steel frame building with sidewalls consisting of masonry, insulated panels, and window wall panel systems. Constructed in the early 1960s the school and existing library are approximately 114,000 square feet. The school and library are directly adjacent to the Gold Star Pool complex, which includes a single story, 700 square foot locker room and service building. The existing building will be demolished and the selected feasibility option rebuilt.

General Project Description

The facility will be redesigned to include a JK-5 Program, an Upper School Program, Community School, and Afterschool programs. The resulting KOCSUSCC will provide more engaging open space around the complex and will further enhance the neighborhood with better lighting and landscaping. The King Open and Cambridge Street Upper Schools will be approximately 181,400 sq.ft., Human Services approximately 14,632 sq.ft., the Library 10,667 sq.ft., the Gold Star Pool Building 4,185 sq.ft., and 28,000 sq.ft. of structured parking for a total of the current estimated gross square footage of the new building is 238,884 sq.ft. In addition these to program spaces, if CPS Admin Offices are included in the project scope it will add an estimated size of 23,118 sq.ft, for a total Program space requirements of 262,002 sq.ft. The new facility shall support the missions of King Open and Cambridge Street Upper School, expanding program spaces where necessary. The facility shall be sufficiently flexible to accommodate a variety of academic and community uses throughout the school year and over the building's lifespan.

Program requirements for the new facility include the following:

- 22 core classrooms for King Open
- 16 core classrooms for Cambridge Street Upper School

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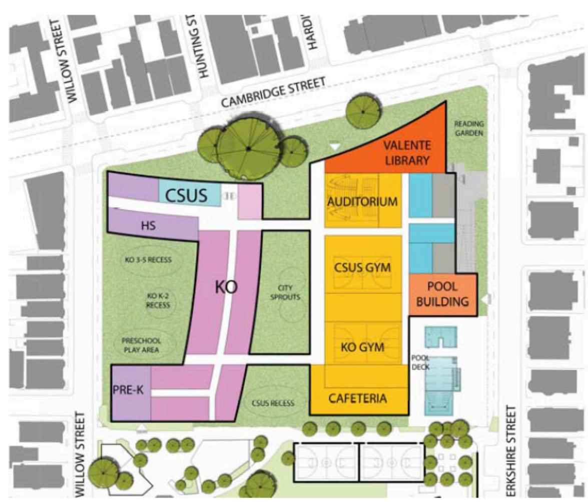
- Expanded spaces for Office of Student Services programs
- Expanded spaces for project based learning activities
- Two gymnasiums
- 400 seat auditorium
- 300 seat cafeteria
- Additional preschool capacity
- Expanded space for Human Services after school programs
- Expanded Valente Library collections for all age groups
- Young swimmers' pool and expanded pool deck
- Offices for Cambridge Public Schools Administration
- Underground parking garage

In addition to the specific space requirements, the new complex shall integrate with the local community. Creation of new open space on all four sides of the building is a top priority, as is a visual or practical connection between Cambridge Street, on the south side of the site, and Donnelly Field, on the north side. The Valente Library will have easy after-hours access to shared resources (such as the gymnasiums) and will further build community by its site placement to be increasingly inviting local residents to interact with the complex. Finally, the school buildings shall be designed with automobile and pedestrian travel patterns in mind.

The project team, being led by William Rawn Associates and Arrowstreet, conducted a feasibility study for the reconstruction of the King Open School and is reviewing two options during this study. Both Option 1 and Option 2 support the major objectives of increasing the school size, increasing the green space, and providing easy after-hours community access. See image of options below developed by William Rawn Associates, Architects Inc. and Arrowstreet Inc. as presented in the feasibility study. The final Feasibility Study has declared Option 2 as the preferred architectural design.

OPTION 1



OPTION 2

Overall Environmental & Sustainability Goals

The City of Cambridge seeks to lead by example in reducing and minimizing greenhouse gas emissions and other environmental impacts of its facilities. The City is committed to meeting their environmental, sustainable, and "green" building goals related to energy efficiency, indoor environmental quality, and resource efficiency.

The KOCSUSCC Project will be designed and constructed using applicable industry best practices to achieve its environmental goals and ultimately provide a safe and healthy environment for building occupants with minimal negative impact on the local, regional and global environment. The project is pursuing a possible LEED Silver rating based on the LEED v4 for BD+C: Schools scorecard provided in the feasibility narratives. Key high performance building goals that have been defined for the project include:

- Superior indoor environmental quality
- Superior community connectivity
- School to be used as a teaching tool
- Net Zero
- LEED v4 for BD+C: Schools Certification - June 18, 2015 scorecard indicates:
    - A minimum 42% site energy use reduction
    - Onsite renewable energy systems
    - A minimum 40% potable water use reduction

PERFORMANCE CRITERIA & OBJECTIVES

General

1. *GREEN BUILDING RECOGNITION*
   LEED v4 for BD+C: Schools Certification.

2. *OUTDOOR DESIGN CONDITIONS*
   Per ASHRAE weather data tables and the IECC 2009* Climate Zone 5 *(Reference Appendix C for local climatic data)*

Winter:	5 °F
Summer:	91 °F (db) | 74 °F (wb)
Heating Degree Days:	5,641
Cooling Degree Days:	678
Weather Data:	TMY3 Boston Logan Int'l Airport

**Cambridge is a stretch community which means the IECC 2009 is the basis. However, the stretch code will likely change before this project is permitted, but it is unknown at this time if it will be IECC 2012 or 2015. The OPR will be updated to reflect correct IECC.*

3. *INDOOR DESIGN CONDITIONS*
   More detailed information including unoccupied setback temperatures is provided below.

Indoor Heating:	70°F +/- 2°F
Indoor Cooling:	76°F +/- 2°F (55% RH)

4. *HOURS OF OPERATION (REFERENCE APPENDIX D FOR HVAC CONTROLS AND LIGHTING SCHEDULE)*
   As the primary building use is a school, usage will be heaviest during in-session hours. However, offices and athletic facilities will remain open into the evening, and community functions will require additional variable hours. The occupancy schedule being used in the feasibility study are similar hours to the MLK, Jr. School. However, the following schedule was provided by the architects:

King Open School (M-F):	7:30am – 2:55pm
Cambridge Street Upper School (M-F):	7:30am – 2:55pm

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Human Services After School (M-F):	2:55pm – 6:00pm
Pre-K (year-round):	7:00am – 6:00pm
General Building Hours:	6:00am – 11:00pm
Summer Building Hours:	8:00am – 5:30pm

5. *Systems Design*

The project requirement for Net Zero Energy, combined with the requirement for superior indoor environmental quality, result in the need for high performance HVAC systems. The design team has developed system concepts that respond to these owner's requirements. See *Appendix C* for more information. The latest revisions to the NZE goal have the feasibility and design team investigating alternative design options for the kitchen equipment, domestic hot water heating equipment, and space heating back-up for the geothermal system to eliminate the on-site fossil fuel.

<u>Systems Redundancy & Emergency Power</u>:
Central Heating Plant Systems = N+1 @ 50%
Primary Air Handling Systems Fans = N+1 @ 50% (i.e., two 5,000 CFM fans for a 10,000cfm unit)
Domestic Hot Water System = N+ 1 @ 100%
Secondary equipment = N+0 (i.e., no redundancy requirement)

An emergency generator will be provided for life safety loads. Additional emergency power loads will include elevator, back-up heating systems, refrigeration equipment, and communications systems.

The system redundancy and emergency generator requirements listed above are documented as system recommendations in this OPR and will be further developed and refined during the design phases of the project and based on meetings with EverSource.

<u>Systems & Equipment Lifecycle Cost Evaluation</u>:
System type selection and design and equipment selection shall be evaluated based on providing optimum building operation and equipment service life over the lifecycle of the building. The City of Cambridge has determined on previous projects the requirement of a minimum life expectancy of 50 years for new facilities. Systems and equipment evaluation shall consider the following: first cost, annual energy costs, annual operations and maintenance costs, replacement costs and possible rebates and incentives. As part of the Feasibility Phase, a life cycle cost analysis study has been performed for the building's HVAC systems by VJ Associates and WT Rich/KBE. This cost analysis will be used to help further evaluate and define systems to be incorporated into the design.

<u>Systems & Equipment Capacity</u>:
The Feasibility Study states that systems shall be designed to satisfy 100% of the design load without diversity. However, on other similar projects, diversity has been included in the system design. During the design phase, the design team shall evaluate and determine when and how diversity may be used in determining the capacity for central plant systems. The diversity recommendation shall be approved by the City and included in the Basis of Design to indicate when diversity is used in determining system capacity and the assumed diversity rate.

<u>Systems Controllability</u>:

A new DDC automatic temperature control and building energy management system shall be installed to control and monitor building HVAC systems. Full compatibility and integration with the existing city wide BMS is required. Energy metering shall also be installed to monitor energy usage of the building HVAC systems and utilities. Use of Original Equipment Manufacturer's (OEM) controls shall be reviewed and approved by the owner.

Systems Operations & Maintenance:
Similar to recent Cambridge School projects, the City of Cambridge requires detailed electronic and paper O&Ms, as well as detailed as-built documentation. Rigorous owner training shall also be provided for all MEP equipment, kitchen equipment, and security equipment to facilitate the owner's ability to operate and maintain the building.

6. *PROJECT TURNOVER REQUIREMENTS*
The following items will be required at project turnover to ensure the Owner and property management staff possesses the information and knowledge necessary to operate and maintain the building for optimum energy efficiency and performance. Turnover items will include:

- As-built drawings
- Building Operations and Maintenance Manual
- Training on building systems for Owner's facilities management staff

7. *WARRANTY REQUIREMENTS*
The KOCSUSCC project will have an industry standard one-year warranty period from the date of substantial completion. Specific material and equipment warranties have not been defined for the project.

Indoor Environmental Quality

1. *VENTILATION & INDOOR AIR QUALITY*
In addition to meeting code and good engineering practice, the project will comply with LEED BD+C Indoor Environmental Quality prerequisite Minimum Indoor Air Quality Performance per the requirements of ASHRAE Standard 62.1 and smoking will be prohibited in the building in accordance with LEED BD+C Indoor Environmental Quality prerequisite Environmental Tobacco Smoke Control. CO_2 monitoring for all densely occupied spaces will be provided to meet the requirements of LEED BD+C credit Enhanced Indoor Air Quality Strategies Option 2.

2. *CONSTRUCTION INDOOR AIR QUALITY MANAGEMENT*
The contractor will be required to develop and adhere to a Construction Indoor Air Quality Management Plan to meet the requirements of LEED BD+C Indoor Environmental Quality credit Construction Indoor Air Quality Management Plan during the construction period. The plan shall include provisions to meet control measures per SMACNA IAQ guidelines, protection of absorptive building materials and protection of air handling HVAC systems to be used during construction.

3. *THERMAL COMFORT*
The project will be designed to comply with the requirements of LEED BD+C credit Thermal Comfort regarding thermal comfort design. Heating, ventilation and air conditioning systems as well as the building enclosure will be designed to meet the requirements of ASHRAE Standard 55-2010. The resulting operative temperatures are listed in the table below:

Project Space Type	Winter (Heating)			Summer (Cooling)			CO_2 Control
	Occupied	Unoccupied	RH Control	Occupied	Unoccupied	RH Control	
Auditorium	70°F	60°F	None	75°F	85°F	55%	Yes
Gym	70°F	60°F	None	75°F	85°F	55%	Yes
Cafeteria	70°F	60°F	None	75°F	85°F	55%	Yes
Kitchen	70°F	60°F	None	75°F	85°F	55%	CO detection
Library	70°F	60°F	None	75°F	85°F	55%	Yes
Media Center	70°F	60°F	None	75°F	85°F	55%	Yes
Pool	70°F	60°F	None	75°F	85°F	55%	Yes
Locker Rooms	70°F	60°F	None	75°F	85°F	55%	No
Multi-Purpose Room/Lobby	70°F	60°F	None	75°F	85°F	55%	Yes
Fitness Rooms	70°F	60°F	None	75°F	85°F	55%	Yes
King Open Classrooms	70°F	60°F	None	75°F	85°F	55%	Yes
Upper School Classrooms	70°F	60°F	None	75°F	85°F	55%	Yes
Pre-K Classroom	70°F	60°F	None	75°F	85°F	55%	Yes
Administration and Nurse Areas	70°F	60°F	None	75°F	85°F	55%	No
Administration Building	70°F	60°F	None	75°F	85°F	55%	No

The Thermal Comfort table above has been developed to include in the OPR and in the Feasibility Study dated December 2015. The following review comments have been provided by InPosse and should be further discussed and refined during the design phase to allow use of these thermal comfort requirements during commissioning of the project.

- *Comments 12/17/2015*
  - *InPosse – Users should have the opportunity to adjust temperature set point higher during the summer if desired for energy savings.*
  - *InPosse – Per the mechanical engineer, CO2 control is set at the system level not the space level. This table is to capture and clarify which spaces should have CO2 monitoring.*
  - *InPosse – HVAC Relative Humidity Control – the project HVAC system design will have cooling dehumidification control at the central air handling units; but the individual zones will not. For example, the RTUs will have a means of reheat (either a reheat bypass damper or dual energy wheel technology), but room zone VAV boxes will not have hot water reheats.*

4. *Natural Light*

The project will provide windows in regularly occupied dwelling unit and common area spaces to provide views to the exterior and promote occupant health and well being to meet the requirements of LEED BD+C Indoor Environmental Quality credit Daylight and/or Quality Views. Adjustable window treatments will be provided to control glare and provide occupant privacy.

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5. *LIGHTING SYSTEMS & CONTROLS*

   The project will provide lighting controllability in conformance with LEED BD+C Indoor Environmental Quality credit Interior Lighting. The lighting controls shall have BACNect gateway for DDC input functions. Levels at all spaces will be designed in accordance with IESNA standards while reducing light power densities by a minimum of 60% compared to then IECC 2009 baseline as part of the projects overall energy use reduction strategy as it relates to LEED BD+C Energy and Atmosphere credit Optimize Energy Performance. Lighting levels will be approximately 30 foot cancels in classrooms and offices. The daylight dimming foot candle level will be in compliance with LEED BD+C Indoor Environmental Quality credit Daylight.

   Each space will be locally switched and designed for multi-level controls. The classrooms, office spaces, and toilet rooms will have an occupancy sensor to turn lights off when unoccupied, known as vacancy sensors. Daylight sensors will be installed in each room where natural light is available for dimming of light fixtures.

   Emergency and exit lighting will be run through life safety panels to be on during normal power conditions as well as power outage conditions. Emergency lighting will have time control so that lights are "on" only when building is occupied. Security lighting at vestibules will be provided.

6. *ACOUSTICS*

   The project will comply with LEED BD+C Indoor Environmental Quality prerequisite Minimum Acoustic Performance for acoustic performance levels for all school, preschool and after school programs. The design team will ensure that all classrooms meet the Sound Transmission Class (STC), background noise and reverberation time requirements of ANSI Standard S12.60-2010. Mechanical and electrical equipment adjacent to core learning spaces shall be designed to produce a maximum of 40 dBA background sound level. All core learning spaces and learning commons will be designed to the following standards:

Room Type	STC Rating
Core Learning Space	STC 50
Corridor	STC 45
Stair	STC 50
Toilet Room	STC 53
Office/Conference Room	STC 50
Music/Auditorium/Gym/Cafeteria/Mech.	STC 60

Energy Efficiency/Net Zero Potential

1. *ENERGY USE REDUCTION*

   The project will be designed to comply with the IECC 2009 including Massachusetts amendments and seeks to reduce its predicted site energy use by at least 42% when compared to its ASHRAE 90.1-2010 compliant baseline. The 42% site energy use reduction goal shall be achieved without including the production of any onsite renewable energy systems. The production of onsite renewable energy systems will be included in calculations and credit templates to demonstrate compliance with LEED BD+C Energy and Atmosphere prerequisite Minimum Energy Performance and credit Optimize Energy Performance.

   **Cambridge is a stretch community which means that the IECC 2009 is the basis. However, the stretch code will likely change before this project is permitted, but it is unknown at this time if it will* *be IECC 2012 or 2015. The OPR will be updated to reflect correct IECC. ASHRAE 90.1-2010 is being used as a baseline since the project will be registered as a LEED for Schools V 4.0 project.*

2. *BUILDING LEVEL & END USE ENERGY METERING*
The current Feasibility Study states that metering shall be provided for natural gas, electric and water to comply with LEED BD+C Energy and Atmosphere prerequisite Building-Level Energy Metering. Sub-metering is to be provided for lighting, mechanical equipment, kitchen equipment, elevators and plug loads with a BACNet interface for connection to either the BMS or a building dashboard system to comply with LEED BD+C Energy and Atmosphere credit Advanced Energy Metering. Multiple dashboard systems are being considered for this project for occupant education. If dashboards are provided, the information displayed should be broken out into upper school, lower school, library, and administration areas at a minimum. InPosse has recommended that additional sub-metering shall be required to provide guidance to building occupants on energy use. The sub-metering requirements will be further developed during schematic design.

3. *RENEWABLE ENERGY PRODUCTION*
To help achieve the City and School's project Net Zero energy goals the project seeks to offset as much of its electrical site energy use as possible by incorporating a roof mount photovoltaic system. The project will presumably exceed the requirements for LEED BD+C Energy and Atmosphere credit Renewable Energy Production, producing more than 10% of the buildings' annual energy by cost. In order to meet the Net Zero energy goal, the Feasibility Study included the initial energy model developed by InPosse supporting the pursuit of net zero site energy on an annual basis. InPosse has indicated that the PV system design will be required to mount the PV panels in connected arrays and supported on an independent structure above the building roof in order generate the most energy for the available area to achieve the the NZE goal. With the administrative spaces included in the project 130,390 square feet of this array design is required to meet the NZE goal. InPosse has developed a conceptual energy analysis which predicts the building energy use intensity (EUI) at the site to be approximately 35.0 kBtu/sf/yr, depending on preferred system design. In addition to the conceptual energy model, InPosse used known energy usage for similar NZE buildings to develop a benchmark of 30kBtu/sf./yr. InPosse has estimated that only 70-75% of the available roof area could be used for PV panels. The study has indicated that, in addition to maximizing roof mounted PV, additional PV arrays will be required on the site to achieve Net Zero. Solar thermal is being considered during the design phase providing heating for the swimming pool.

The addition of the Administration program to the facility means that the Net Zero accounting for the school will have to address the complexity of the energy use by this additional program element.

Water Efficiency

1. *INDOOR WATER USE REDUCTION*
The project seeks to reduce overall water usage by a minimum of 40% (not including irrigation) from baseline flow fixture performance of the EPA Energy Policy Act of 1992 per LEED BD+C Water Efficiency prerequisite Indoor Water Use Reduction and credit Indoor Water Use Reduction. Potable water use will be reduced using a combination of low and ultra low flow plumbing fixtures and a rainwater reclamation system. This system will harvest rainwater from roof areas and stored in an underground storage cistern and will be used for flushing of water closets and urinals as well as the irrigation of plantings on the site.

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Review of the Feasibility Study Volume 4: Cost Estimate includes a detailed Value Engineering Summary which includes the omission of the rainwater reclaim system. This OPR item will be reviewed with the City, and updated accordingly through the design phase.

Materials

The City of Cambridge has set a minimum life expectancy goal for the project of 50 years. Materials and systems recommendations for the project should be selected with consideration of the complete cradle to grave impact of the material. Material life-cycle assessment (LCA) accounts for the environmental impacts associated with a material or system for its entire life. (i.e., from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling) The useful life of all products and materials should equal or exceed the standards applicable to the product when compared to industry standards and best practices.

1. *Materials Properties*
   Interior materials will be selected and specified to minimize exposure to volatile organic compounds (VOCs) in accordance with LEED BD+C Indoor Environmental Quality credit Low-Emitting Materials. Materials shall also be specified to contain recycled and/or locally produced materials per LEED BD+C Materials and Resources credit Building Product Disclosure and Optimization—Sourcing of Raw Materials.

2. *Storage and Collection of Recyclables*
   An easily accessible area will be provided that is dedicated to the separation, collection, and storage of materials for recycling including; paper, cardboard, glass, plastics and metals at a minimum per LEED BD+C Materials and Resources prerequisite Storage and Collection of Recyclables.

3. *Site Waste Management*
   75% of non-hazardous construction and demolition wastes will be diverted from landfills per LEED BD+C Materials and Resources credit Construction and Demolition Waste Management.

Site Features

1. *Heat Island Reduction*
   Roofing systems will be designed to meet the requirements of LEED BD+C Sustainable Sites credit Heat Island Reduction by providing a combination of high-albedo materials (SRI ≥78) and roof mount photovoltaic systems at >75% of low slope roofing areas.

2. *Light Pollution Reduction*
   Site lighting shall be designed to minimize light pollution by minimizing the amount of exterior lighting and minimizing light trespass by utilizing full cutoff and shielded light fixtures where appropriate. The project team will evaluate the ability to satisfy the requirements of LEED BD+C Sustainable Sites credit Light Pollution Reduction while also meeting all life safety and security requirements.

Schedule & Limitations

Stephen Turner Inc.'s understanding of the current project schedule and milestones is detailed below:

Feasibility Study Phase Complete	December 2015
Schematic Design Documents	January 2016 – May 2016
Design Development Phase	June 15, 2016 – November 1, 2016
Construction Documents Phase	January 1, 2017 – May 31, 2017
Site Work (Geothermal)	November 1, 2016 – December 1, 2017
Construction Phase	July 2017 – June 2019
Substantial Completion	June 1, 2019
First Year Occupancy Phase	June 1, 2020
Warranty End Review	April 2020

Budget Considerations & Limitations

The three elements that have impact on the budget considerations and limitations are first cost, energy cost and O&M cost.

Appendix A – Commissioning Scope

City of Cambridge KOCSUSCC

LEED v4 Fundamental and Enhanced Commissioning Process

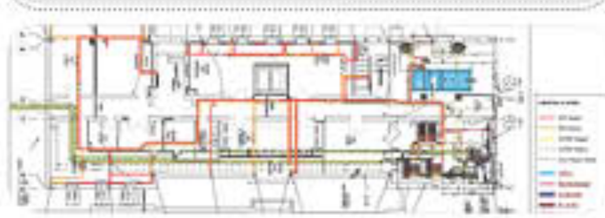
For each phase, commissioning tasks required by LEED NCv4 Fundamental and Enhanced Commissioning are listed below.

FUNDAMENTAL COMMISSIONING

PLANNING	DESIGN	CONSTRUCTION	TURNOVER	CLOSEOUT
Determine appropriate commissioning scope and budget Engage a Commissioning (Cx) Authority with proper experience and credentials Develop Initial Owner's Project Requirements (OPR) related to commissioned systems	Develop Preliminary Cx Plan Review Basis of Design (BOD) Develop Cx Specifications Review OPR & BOD and mid-design documents Update OPR, BOD & Cx Plan	Conduct Cx Kickoff Meeting Develop and Manage Pre-functional Checklists Conduct Pre-functional Inspections *(including site visits, field observations, review of start-up forms, construction checklists, witness start-up and TAB and completed reports)* Develop Testing Plan, Testing Procedures and Witness Functional Performance Testing (FPTs) Develop and maintain Cx Issues Log	Provide commissioning summary report Compile Current Facility Requirements (CFR) and Operations and Maintenance (O&M) Plan	*No Fundamental Commissioning requirements*

ENHANCED COMMISSIONING

PLANNING	DESIGN	CONSTRUCTION	TURNOVER	CLOSEOUT
Option 1. Path 1 - Develop & Include Systems Manual Requirements in the OPR **Option 1. Path 1** - Develop & Include Training Requirements in the OPR	**Option 1. Path 1** - Develop Systems Manual Scope and Format **Option 1. Path 1** - Develop Training Requirements in the Cx Specifications **Option 1. Path 1** - Verify Enhanced Cx Requirements in the Cx Plan, Cx Specifications, and construction documents **Option 1. Path 2** - Verify Monitoring Based Cx (MBCx) Requirements are included in OPR & BOD, Cx Plan & Cx Specs **Option 2.** - Incorporate Building Envelope Cx (BECx) into Cx Plan	**Option 1. Path 1 -** Review Contractor Submittals **Option 1. Path 2 -** Implement MBCx Plan concurrently while executing FPTs	**Option 1. Path 1** - Witness owner training Verify Owner Training Program has been completed in accordance with OPR. **Option 1. Path 1** - Provide Post-Construction Documents *(Including Up-to-date systems manual, documentation of training, FPT reports, Up to date Issues Log, Updated Cx Plan including plan for seasonal testing & 10th Month Review)*	**Option 1. Path 1** - Perform deferred seasonal FPTs (if required) **Option 1. Path 1** - Conduct 10 month review of building operations **Option 1. Path 1** - Develop Ongoing Cx Plan



Stephen Turner Inc.
Building Better Performance

Appendix B – LEED Scorecard

PROJECT CHECKLIST - LEED V4 FOR BD+C: SCHOOLS

Y	?	N			
0	1	0	Credit 1	Integrative Process	1
4	**8**	**3**		**Location and Transportation**	**15**
0	0	na	Credit 1	LEED for Neighborhood Development Location	15
1	0	0	Credit 2	Sensitive Land Protection	1
0	2	0	Credit 3	High Priority Site	2
2	3	0	Credit 4	Surrounding Density and Diverse Uses	5
1	1	2	Credit 5	Access to Quality Transit	4
0	1	0	Credit 6	Bicycle Facilities	1
0	0	1	Credit 7	Reduced Parking Footprint	1
0	1	0	Credit 8	Green Vehicles	1
6	**4**	**2**		**Sustainable Sites**	**12**
Y			Prereq 1	Construction Activity Pollution Prevention	Required
Y			Prereq 2	Environmental Site Assessment	Required
1	0	0	Credit 1	Site Assessment	1
2	0	0	Credit 2	Site Development - Protect or Restore Habitat	2
1	0	0	Credit 3	Open Space	1
0	3	0	Credit 4	Rainwater Management	3
1	0	1	Credit 5	Heat Island Reduction	2
0	1	0	Credit 6	Light Pollution Reduction	1
0	0	1	Credit 7	Site Master Plan	1
1	0	0	Credit 8	Joint Use of Facilities	1
5	**3**	**4**		**Water Efficiency**	**12**
Y			Prereq 1	Outdoor Water Use Reduction	Required
Y			Prereq 2	Indoor Water Use Reduction	Required
Y			Prereq 3	Building-Level Water Metering	Required
0	2	0	Credit 1	Outdoor Water Use Reduction	2
4	1	2	Credit 2	Indoor Water Use Reduction	7
0	0	2	Credit 3	Cooling Tower Water Use	2
1	0	0	Credit 4	Water Metering	1
26	**3**	**2**		**Energy and Atmosphere**	**31**
Y			Prereq 1	Fundamental Commissioning and Verification	Required
Y			Prereq 2	Minimum Energy Performance	Required
Y			Prereq 3	Building-Level Energy Metering	Required
Y			Prereq 4	Fundamental Refrigerant Management	Required
6	0	0	Credit 1	Enhanced Commissioning	6
16	0	0	Credit 2	Optimize Energy Performance	16
1	0	0	Credit 3	Advanced Energy Metering	1
0	2	0	Credit 4	Demand Response	2
3	0	0	Credit 5	Renewable Energy Production	3
0	1	0	Credit 6	Enhanced Refrigerant Management	1
0	0	2	Credit 7	Green Power and Carbon Offsets	2
5	**8**	**0**		**Materials and Resources**	**13**
Y			Prereq 1	Storage and Collection of Recyclables	Required
Y			Prereq 2	Construction and Demolition Waste Management Planning	Required
0	5	0	Credit 1	Building Life-Cycle Impact Reduction	5
1	1	0	Credit 2	"Building Product Disclosure and Optimization - Environmental Product Declarations"	2
0	2	0	Credit 3	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
2	0	0	Credit 4	Building Product Disclosure and Optimization - Material Ingredients	2
2	0	0	Credit 5	Construction and Demolition Waste Management	2
8	**8**	**0**		**Indoor Environmental Quality**	**16**
Y			Prereq 1	Minimum Indoor Air Quality Performance	Required
Y			Prereq 2	Environmental Tobacco Smoke Control	Required
Y			Prereq 3	Minimum Acoustic Performance	Required
0	2	0	Credit 1	Enhanced Indoor Air Quality Strategies	2
2	1	0	Credit 2	Low-Emitting Materials	3
1	0	0	Credit 3	Construction Indoor Air Quality Management Plan	1
0	2	0	Credit 4	Indoor Air Quality Assessment	2
1	0	0	Credit 5	Thermal Comfort	1
1	1	0	Credit 6	Interior Lighting	2
2	1	0	Credit 7	Daylight	3
1	0	0	Credit 8	Quality Views	1
0	1	0	Credit 9	Acoustic Performance	1
4	**2**	**0**		**Innovation**	**6**
1	0	0	Credit 1	Exemplary Performance Eac 5 Renewable Energy Production 100%	1
1	0	0	Credit 1.2	Exemplary Performance MRc5 Construction and Demolition Waste Management 90%	1
0	1	0	Credit 1.3	Innovation: Building as a Teaching Tool	1
0	1	0	Credit 1.4	Pilot Credit: Food Production	1
1	0	0	Credit 1.5	Pilot Credit: Social Equity within Project Team (Construction Workers)	1
1	0	0	Credit 2	LEED Accredited Professional	1
3	**1**	**0**		**Regional Priority**	**4**
0	1	0	Credit 1	Regional Priority: Rainwater Management 2 of 3 points	1
1	0	0	Credit 2	Regional Priority: Indoor Water Use Reduction 4 of 7 points	1
1	0	0	Credit 3	Regional Priority: Optimize Energy Performance 8 of 16 points	1
1	0	0	Credit 4	Regional Priority: Renewable Energy Production 2 of 3 points	1
61	**38**	**11**	**TOTALS**	**Possible Points:**	**110**

Certified: 40 to 49 points, Silver: 50 to 59 points, Gold: 60 to 79 points, Platinum: 80 to 110

APPENDIX C – SYSTEM DESIGN OPTIONS

For convenience, these proposed HVAC System Options as described in the Feasibility Study are summarized below, with the exception of the Administration space which is being proposed as an option. Further detail will be provided by the project team in the Basis of Design (BOD) document.

The latest revisions to the NZE goal have the feasibility and design team investigating alternative design options for the kitchen equipment, domestic hot water heating equipment, and space heating back-up for the geothermal system to eliminate the on-site fossil fuel. These alternative options being studied are not included in the systems narrative summary below. Stephen Turner Inc. will update the OPR during the design stage to document the revised system design for the project in order to ensure system goals and requirements are met through out the project.

- Central geothermal heating & cooling plant systems for primary heating and cooling includes three design options:
    - Base design – (7) water to water source heat pump chillers with 70 ton capacity each, provided with ground source condenser water from (150) closed loop wells
    - Alternate design – (7) water to water source heat pump chillers with 70 ton capacity each provided with ground source condenser water from (15) 1500 feet standing column type wells. Each well will have a capacity of 30 tons and 75gpm.
- To address seasonal ground temperature effect, the central heating plant includes high efficiency gas-fired condensing boilers, which also provide back-up heating for redundancy.
- For classrooms, the design team has proposed displacement ventilation, with outdoor air being provided by the associated central air handling unit. Each classroom space is to be equipped with a variable volume (VAV) terminal box with CO_2 monitoring to control outdoor air. Hot water light shelf radiant heating panels will be provided along perimeter walls for additional heating support.
    - Air handling units will include dual energy recovery wheels, hot water heating and chilled water cooling coils with modulating capacity control.
- Similar systems are proposed for the Cafeteria and Staff Lunch areas.
- Gymnasiums, Fitness Rooms, P.E. Office areas, Multi-Purpose Room, Lobby, Valente Library, Media Center and Auditorium will be served by multiple recirculating air handling units with dual energy recovery wheels, hot water heating and chilled water cooling coils with modulating capacity control and CO_2 control. Supplemental hot water radiant panels will be provided along perimeter walls in all spaces listed above except the Auditorium.
- Locker rooms will be served by an air handling unit with 100% outside air design with energy recovery and hot water heating and cooling coils.
- Administration and Nurses areas in the King Open and Cambridge Upper Street Schools will be served by horizontal ceiling ducted 4-pipe heating and cooling active chilled beam induction units being provided hot and chilled water from the boiler and geothermal heating and cooling central plants. In addition to the active chilled beam induction units these spaces will be provided ventilation through the use of air handling units with dual energy recovery and hot water heating and cooling coils.
- The Kitchen will be provided with make-up air from the AHU, which also serves the Cafeteria and Staff Lunch Areas.
    - *In-Posse commented that the kitchen make-up air should be independent of other use areas and should be interlocked with the hood operation. This should be further discussed in schematic design.*

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- The lobby, corridor and entry way heating will be provided by hot water convectors cabinet unit and fin tube radiation heating. The corridor ventilation will be served from adjacent air handling systems. The custodial areas will be heated and ventilated by a dedicated heating and ventilation unit with hot water heating and modulating capacity control. Storage areas will be heated via radiation heating equipment and horizontal unit heaters serving the loading dock areas and utility areas. The custodial office will be provided with air conditioning through a refrigerant AC system.

APPENDIX D – CLIMACTIC DATA

Weather Station: Boston, MA, US (71.00W,42.36N)
Weather Station ID: KBOS

Temperature	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Avg. Temperature (°F)	28.6	30.3	38.6	48.1	58.2	67.7	73.5	71.9	64.8	54.8	45.3	33.6	51.3
Avg. Max Temperature (°F)	35.7	37.5	45.8	55.9	66.6	76.3	81.8	79.8	72.8	62.7	52.2	40.4	59.0
Avg. Min Temperature (°F)	21.6	23.0	31.3	40.2	49.8	59.1	65.1	64.0	56.8	46.9	38.3	26.7	43.6
Days with Max Temp ≥ 90 °F	0.0	0.0	0.0	< 0.5	< 0.5	3.0	6.0	3.0	1.0	0.0	0.0	0.0	12.0
Days with Min Temp ≤ 32 °F	26.0	23.0	17.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	21.0	97.0

Heating and Cooling	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Heating Degree Days	1128	972	818	507	221	32.0	0.0	6.0	72.0	321	591	973	5641
Cooling Degree Days	0.0	0.0	0.0	0.0	10.0	113	264	220	66.0	5.0	0.0	0.0	678

Precipitation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Precipitation (inches)	3.6	3.6	3.7	3.6	3.2	3.1	2.8	3.2	3.1	3.3	4.2	4.0	41.5
Days with Precipitation ≥ 0.01″	12.0	10.0	12.0	11.0	12.0	11.0	9.0	10.0	9.0	9.0	11.0	12.0	127
Monthly Snowfall (inches)	12.8	11.8	8.0	0.9	0.0	0.0	0.0	< 0.05	0.0	0.0	1.3	7.6	42.4

Other Weather Indicators	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Wind Speed (mph)	13.8	13.9	13.7	13.1	12.1	11.4	11.0	10.8	11.3	11.9	12.8	13.5	12.4
Clear Days	9.0	8.0	8.0	7.0	6.0	7.0	7.0	9.0	10.0	11.0	8.0	9.0	98.0
Partly Cloudy Days	7.0	7.0	8.0	8.0	10.0	10.0	12.0	11.0	8.0	8.0	7.0	7.0	103
Cloudy Days	15.0	13.0	15.0	15.0	15.0	13.0	12.0	11.0	12.0	12.0	15.0	15.0	164
Percent of Possible Sunshine	53.0	56.0	57.0	56.0	58.0	63.0	65.0	65.0	63.0	60.0	50.0	52.0	58.0
Avg. Relative Humidity	51.0	63.0	63.0	63.0	63.0	66.0	66.0	66.5	69.0	68.5	66.0	64.5	65.5

APPENDIX E – BASE UTILITY RATES

The following utility rates shall be used in lifecycle cost analysis for determining simple payback and rate of return for proposed equipment and systems.

Utility Rates:

Electricity	\$0.0978/kWh + \$7.32/month
Natural Gas	\$0.7545/therm + \$30.55/month
Water	\$3.64/CCF