

Jeff Hirsch

From: Putnam, Andrew <aputnam@cambridgema.gov>
Sent: Wednesday, November 30, 2022 11:28 AM
To: Messplay, Daniel
Cc: Joseph, Swaathi; Pat Conte; Jim Rafferty - Adams and Rafferty Attorney at Law (jrafferty@adamsrafferty.com); Jeff Hirsch; Lefcourt, David
Subject: 75 First St. First St. Cambridge - PUD 231A / Special Permit Application to CDD and Planning Board - Tree Memo
Attachments: 85 First St Bartlett Tree Memo.pdf

Hi Daniel,

The special permit project for 75 First St does not have any significant trees on the parcel. A Certified Arborist has submitted a memo attesting there are no significant trees. The applicant has satisfied the requirements of the TPO.

Thanks
Andrew

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From: Jeff Hirsch <jhirsch@urbanspacesllc.com>
Sent: Tuesday, November 22, 2022 5:54 PM
To: Lefcourt, David; Putnam, Andrew
Cc: Joseph, Swaathi; Pat Conte; Jim Rafferty - Adams and Rafferty Attorney at Law (jrafferty@adamsrafferty.com); Messplay, Daniel
Subject: 75 First St. First St. Cambridge - PUD 231A / Special Permit Application to CDD and Planning Board - Tree Memo

Hi Andrew:

Please see the attached memo from arborist Andrew Balon at Bartlett Tree Experts stating that there are no trees on the 75/85 First St. site that is currently pursuing a special permit for the development of a new mixed use multi family building. Can you review the site and certify the findings per the Cambridge Tree Protection Ordinance of the City of Cambridge, Chapter 8.66.

Thanks

Jeff Hirsch, RA
Vice President of Operations

Urban Spaces
55 Bent Street, Cambridge, MA 02141
O 617.868.5558 ext. 112 | M 617.388.0370
www.urbanspacesllc.com



Urban Spaces
55 Bent Street
Cambridge MA, 02141

RE: 85 First St, Cambridge Ma Tree Inspection
ATTN: Jeff Hirsch, Vice President of Operations

To Whom It May Concern,

Per site inspection on October 19, 2022, zero (0) privately owned trees were identified within the property limits.

The owner, Jeff Hirsch, attended the site visit.

.
Thank you,

A handwritten signature in black ink, appearing to be 'ABALON', is located below the 'Thank you,' text. The signature is stylized and cursive.

Andrew Balon
Bartlett Tree Experts
50 Bear Hill Rd, Waltham MA 02451
Commercial Arborist-New England
E: Abalon@bartlett.com
C: 401.617.1480
ISA Certified Arborist- NE-7015
Tree Risk Assesment Qualified

MEMORANDUM

DATE: November 29, 2022
TO: Jim Wilcox, Cambridge Department of Public Works
Sam Corda, Cambridge Water Department
FROM: Brad Johnson, P.E.
RE: 75-85 First Street, Cambridge, MA 02141
Water and Sewer Impact Statement

Bohler Engineering MA, LLC (Bohler) is providing this memorandum to summarize the water and sewer impacts associated with the 75-85 First Street Project (the "Project"). The Project is located on Map 18, Lots 64 and 65.

SEWER SERVICE INFRASTRUCTURE NARRATIVE

Existing Sanitary Sewer System

The City of Cambridge owns, operates, and maintains the sanitary sewer mains in the vicinity of the Project. Based on the City's "CityViewer" Geographic Information System (GIS) mapping service, sanitary sewer mains are present within First Street, Hurley Street, and Spring Street. The sanitary sewer system is separate from the storm drainage system within the above-noted streets.

There are two sewer mains within First Street: a 15-inch is a vitrified clay (VC) pipe that flows southward and runs within the southbound lane (Sewer Main #1) and a 10-inch VC pipe that flows southward and runs within the northbound lane (Sewer Main #2). The sewer main within Hurley Street (Sewer Main #3) is a 15-inch VC pipe that flows eastward and discharges to Sewer Main #1 at the intersection of First Street and Hurley Street. The sewer main within Spring Street (Sewer Main #4) is a 12-inch reinforced concrete pipe (RCP) that flows eastward and discharges to Sewer Main #1 at the intersection of First Street and Spring Street.

Proposed Sanitary Sewer Connection

At this time, the Project's sanitary sewer lateral will connect to Sewer Main #3 in Hurley Street. The service will be constructed in a manner that minimizes impacts to the public right-of-way. Additionally, the sewer service will be independent from the proposed storm drain connections in accordance with the City's standard requirements. The final size, invert, and alignment of the service connection will be coordinated with the Project's plumbing design and the Cambridge Department of Public Works. Floor drains within the covered level of the surface parking will be collected and routed through an approved oil/water separator (OWS) prior to discharge to the City's sanitary sewer system. The grease trap located in the existing surface parking area (which is associated with the 95 First Street building) will remain. Inline backwater valves will also be installed to prevent sanitary sewer backups through the building's fixtures and will be installed by a licensed plumber in accordance with the City's Wastewater and Stormwater Drainage Use Regulations.



Sanitary Sewer Generation Summary

The Massachusetts Department of Environmental Protection (MassDEP) has established and promulgated sewer generation rates for various use types in the *State Environmental Code, Title 5* (310 CMR 15.203). The proposed Project will generate wastewater flow greater than the Site's existing use. **Table 1** summarizes the existing sanitary sewer generation based on the existing use. **Table 2** summarizes the proposed sanitary sewer generation based on the Project programming. The Project is expected to generate approximately 9,722 gallons per day (GPD) of new sewer flow. The proposed sewer generation calculation will be refined as final design progresses. Additionally, the Project Team will coordinate with the City during the design process to ensure Project needs are met without disruption of service to the surrounding area.

Table 1 – Existing Sanitary Sewer Generation

Program Use	Program	Program Unit	Sewer Generation Rate (Title 5)	Estimated Flow (GPD)
Retail	7,046	SF	50 GDP/1,000 SF	352
Total				352

Table 2 – Proposed Sanitary Sewer Generation

Program Use	Program	Program Unit	Sewer Generation Rate (Title 5)	Estimated Flow (GPD)
Retail	3,483	SF	50 GDP/1,000 SF	174
Residential	90	Bedrooms	110 GPD/Bedroom	9,900
Total				10,074

Sanitary Sewer System Mitigation

The proposed sanitary sewer connection is subject to approval by the Cambridge Department of Public Works as part of the Special Permit Project Review process. The City's requirement for infiltration and inflow (I/I) mitigation does not apply to the Project as the net increase in estimated sewer generation does not exceed 15,000 GPD.

Existing Stormwater Management System

An existing subsurface infiltration system was permitted and installed within the existing surface parking lot of 95 First Street ("Parcel D", as shown below in **Figure 1**). This existing system receives runoff from both the Parcel D building (via underground roof drains) and the Parcel D parking lot (via drain inlets). As described further below, the existing system will remain to manage runoff from Parcel D, as it was previously approved under the recent redevelopment of Parcel D. An additional infiltration system (or existing system expansion) is proposed to meet the local and state requirements for the additional Project area ("Parcel E", as shown below in **Figure 1**).

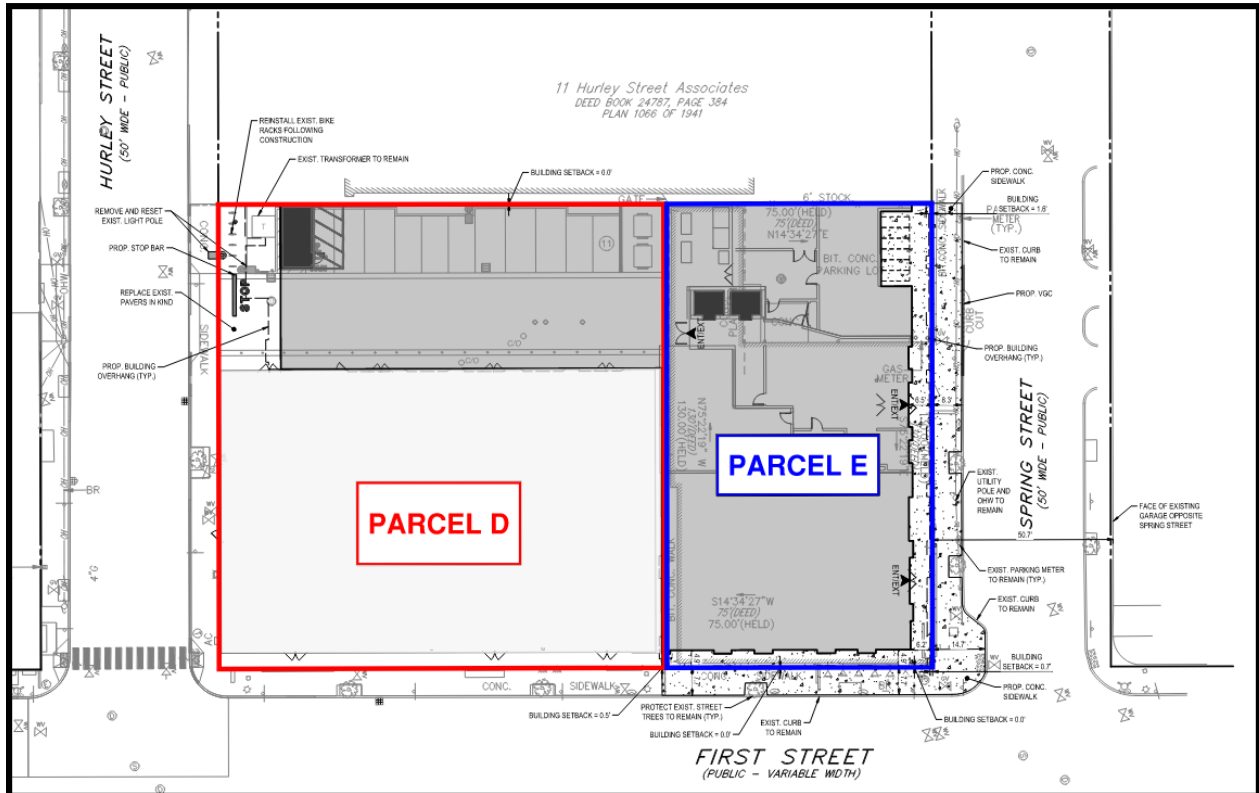


Figure 1: Parcel D and Parcel E. Proposed building depicted in grey.

Proposed Stormwater Management System

The Project involves constructing a portion of the proposed building above the existing Parcel D parking lot. The existing parking lot catch basins will be disconnected from the subsurface infiltration system and routed to sanitary sewer to comply with Massachusetts State Plumbing Code, or replaced with new floor drains and new piping, as necessary. The existing subsurface infiltration system will remain and continue to manage Parcel D runoff from the existing building and parking lot (or new roof area equivalent), as it was originally approved and constructed. The Project will also include an additional infiltration system (or expansion of the existing system) to manage the additional roof runoff from the remaining Project area (i.e. Parcel E roof area). Roof runoff, which does not require pre-treatment under the *Stormwater Management Standards*, will be collected by roof drains and conveyed to the subsurface infiltration system.

The proposed stormwater management system has been designed to comply with the City of Cambridge's *Wastewater and Stormwater Drainage Use Regulations* and MassDEP's *Stormwater Management Standards*. The existing stormwater system will continue to manage runoff from the Parcel D limits as previously approved, and the system expansion will be designed to meet the latest regulations for the additional Project area. The design will provide a net decrease in peak stormwater runoff rates from the proposed facility for the 2-, 10-, 25-, and 100-year design storm events. The infiltration system expansion has been designed to reduce the 25-year post development peak runoff rate to match the 2-year pre-development peak, for the additional Project area (Parcel E), to comply with the City of Cambridge stormwater regulations.



WATER SERVICE INFRASTRUCTURE NARRATIVE

Existing Water System

The City of Cambridge owns, operates, and maintains the water mains in the vicinity of the Project. Based on the City's "CityViewer" GIS mapping service, water mains are present within First Street (12-inch main), Hurley Street (8-inch main), and Spring Street (8-inch). Existing fire hydrants are located at the intersection of First Street/Hurley Street and the intersection of First Street/Spring Street.

Proposed Water Service

At this time, the Project's proposed domestic and fire protection services will connect to the 8-inch main in Spring Street. The final location and type of connection will be coordinated with the Cambridge Water Department. The existing hydrants are proposed to remain in their current location and will remain in service throughout the entirety of construction. If required, the Project will include internal booster pumps to ensure adequate water pressure to all standpipes and sprinkler systems. Prior to final design and building permit filing, existing pressure will be confirmed via a hydrant flow test in coordination with the Cambridge Water Department.

Estimated Water Demand

The Project's water demand is estimated to be the proposed sanitary sewer generation (as listed in **Table 2**) plus 10% (a factor of 1.1). The additional factor accounts for consumption, system losses, and other usages. Based on this formula, the Project's estimated water demand is approximately 11,082 GPD.

Intertek Project No. P3906.01

October 28, 2022

Jeff Hirsch, RA, Vice President of Operations
Urban Spaces
55 Bent Street
Cambridge, MA 02141

**RE: Noise Mitigation Narrative
75 First Street
Cambridge, Massachusetts**

Dear Jeff:

We have studied the MEP equipment associated with the 75 First Street project to predict the sound emissions to the surrounding community. This letter summarizes the assumptions used for this analysis, and findings relative to the City of Cambridge Noise Ordinance.

PROJECT UNDERSTANDING

This project consists of a 6-story multi-family residential development for Urban Spaces with 90 residences. The project will include a single-story podium construction with 5 levels of wood-framed residential construction above. The mechanical systems are anticipated to be electric-based and primarily located on the rooftop.

We understand that the project is still in the early stages of development, so specific details of the design and systems are still to be engineered. In talking with the mechanical engineer, we learned that they expect the residential equipment to consist of variable refrigerant flow (VRF) systems that are likely to be between 1 to 2 tons of capacity located on the rooftop. There will also be an energy recovery ventilator that is likely to have a capacity of 6,000 cfm to supply fresh air and exhaust the building, which will also be located on the rooftop. The rooftop will also have small exhaust fans for utility room exhausts. There will be a 200kW to 250kW emergency generator on the rooftop to provide standby power during outages. The generator will be tested periodically (monthly) during daytime hours.

ACOUSTICAL GOAL

As part of the process for the City, a Noise Mitigation Narrative has been requested for this 75 First Street project to confirm that the MEP equipment will comply with the Cambridge Zoning Ordinance 19.24.7. The Narrative shall detail how the project will mitigate excess sound emissions to comply with the City of Cambridge Noise Ordinance¹ to the neighboring properties. The City's sound pressure level limits are summarized in Table 1 below. Note, Daytime is defined by the City of Cambridge Noise Ordinance as occurring between the hours of 7:00 a.m. and 6:00 p.m. daily except Sunday; outside of these hours, including all of Sunday and holidays, is considered "Other Time".

¹ https://library.municode.com/ma/cambridge/codes/code_of_ordinances?nodeId=TIT8HESA_CH8.16NOCO&searchText=

TABLE 1. MAXIMUM ALLOWABLE SOUND PRESSURE LEVELS (dB) CITY OF CAMBRIDGE										
	Octave Band Center Frequency (Hz)									
	31.5	63	125	250	500	1000	2000	4000	8000	dBA
Residential Daytime 7AM to 6PM (Mon. – Sat.)	76	75	69	62	56	50	45	40	38	60
Residential All Other Times	68	67	61	52	46	40	33	28	26	50
Business Anytime	79	78	73	68	62	56	51	47	44	65

The following properties are the locations where these sound level limits will be studied:

- A. Commercial/retail building directly south on the same block,
- B. Commercial building directly west on the same block,
- C. First Street Garage to the north,
- D. Newly constructed 6- story multifamily residential building (Flats on First Apartments) to the south across Hurley Street,
- E. Newly constructed 3-story multifamily residential building to the southwest across Hurley Street,
- F. Existing multifamily residential building (Charles Passage Apartment Building) to the west along Second Street,
- G. Future multi-family residential building (Cambridge Side residential development) to the east across First Street.

These locations are shown and labeled in the aerial image in Figure 1 below.

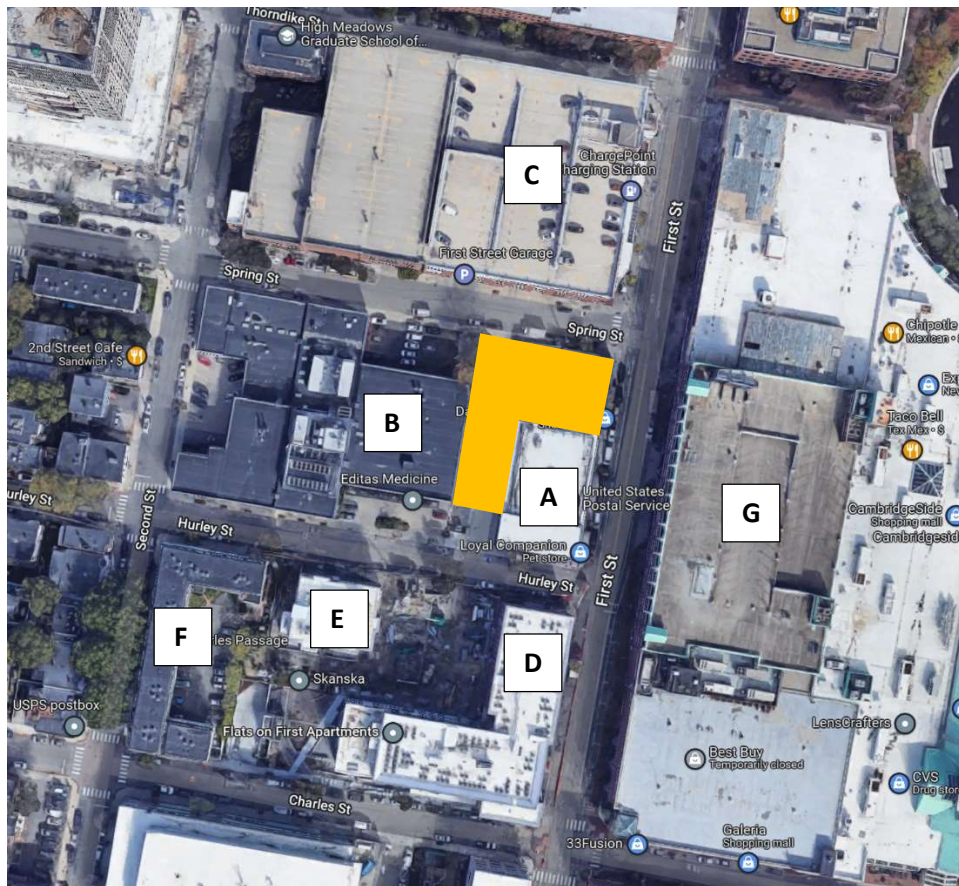


Figure 1. The 75 First Street Project (shaded in yellow) and surrounding properties (labeled A-G).

The corresponding sound level limits for residential and commercial developments will be applied to these neighboring properties to confirm compliance with the predicted sound emissions from the Project.

MEP EQUIPMENT ASSUMPTIONS

The mechanical equipment serving this project will be located on the rooftop of the building. As described above, the exact details of the equipment and the layouts are not yet determined. For the purposes of this study, we have attempted to assume worst-case conditions for estimating the sound emissions. These are described below.

Residential VRFs

The mechanical engineer described that the residences would be served by VRF system that are between 1 and 2 tons of capacity. For this sound emissions analysis, we have assumed that all the residential VRF systems are of 2-ton capacity. The model used for this analysis was Mitsubishi MUZ-HM24NA2 (see attached product sheets).

Regarding the placement of these units, we have assumed that these would be located in groups near the south and east ends of the building. This places them closest to the nearest residences across First Street (the future Cambridge Side residential development) and Hurley Street (Flats on First Street).

Energy Recovery Ventilators

The mechanical engineer estimated that this project would have an energy recovery ventilator with a capacity of roughly 6,000 cfm, most likely located at the intersection of the two wings of the building. In our review of that option, a worst-case scenario was to model the conditions with two (2) 3,000 cfm ERVs placed near the two ends of the building. These smaller ERVs were only 2 dBA quieter than the single ERV, but their placement was nearer to the residences, representing a potentially more significant sound impact if this split approach were chosen. The model used for this analysis was Greenheck RVE-40 (see attached product sheets).

Rooftop Fans

As described by the mechanical engineer, the rooftop will also include a toilet exhaust fan to handle airflow exhausting from these spaces. This is estimated to be about 1,000 cfm. This fan was modeled as Greenheck CUBE-100-3 (see attached product sheets). We note that the sound power level data for this fan was only provided for the Inlet, as opposed to the outlet, which is needed to study the sound emissions to the community. We have added 5 dB to the inlet octave band sound power levels to represent the outlet sound power level for this analysis. This fan was planned at the corner of the building where the two wings come together.

Emergency Generator

The building will have an emergency generator with a capacity of about 200 to 250 kW for standby power when power outages occur. This equipment will be tested periodically (likely on a monthly schedule) during daytime hours. To represent this in the model, we have included the sound emissions of a Kohler 200REOZJF diesel generator on the rooftop. We have added 3 dB to the sound levels of this generator to estimate a condition from a slightly larger generator.

SOUND EMISSIONS PREDICTIONS

We developed a sound emissions model using computer program to study whether noise mitigation is necessary for this equipment. The model was developed in a software called iNoise by DGMR, which uses internationally standardized algorithms for predicting the sound emissions from a source to the surrounding environment. The model accounts for the conditions of the sound sources (sound power,

elevation, etc.), the sound barriers (buildings, rooftop edges, and other obstacles), and the various ground conditions (generally sound reflective pavement in this area).

It is important to note that the sound levels for the rooftop equipment are for full capacity operation. In addition, we have also assumed all the equipment is operating simultaneously. Both these conditions tend to be unusual for typical operating conditions of these facilities, unless one is considering the sound levels in the middle of the daytime during an extremely hot or cold weather condition. At nearly any other time, the many pieces of equipment will tend to have different cycles of operation, such that they are not all operating simultaneously. Likewise, most new systems have variable speed capacity, allowing it to operate at a lower and quieter capacity in most cases. These two conditions again result in this model representing a worst-case scenario for these sound emissions predictions from this project.

The equipment modeled is anticipated to be similar to the equipment that would be used, but may differ somewhat from these choices. As a result, the equipment octave band sound levels can vary from what has been anticipated in the model. For this reason, we have focused the assessment on the A-weighted sound pressure levels (dBA) from the predictions, rather than all the octave band levels and criteria. These would need to be studied in the future to confirm compliance with the City Noise Ordinance by the Project.

Using the various conditions described above, the sound level predictions from the rooftop equipment of the Project to the surroundings are summarized in Table 2 below.

TABLE 2. PREDICTED SOUND PRESSURE LEVELS (dBA) FROM 75 FIRST STREET PROJECT	
Cambridge Sound Level Limits/Location around 75 First Street	dBA
<i>Residential Daytime 7AM to 6PM (Mon. – Sat.)</i>	60
<i>Residential Other Times</i>	50
<i>Business Anytime</i>	65
A. First Street Sidewalk outside of the Commercial Retail Building Entrance	45
B. Commercial Building Rear of the Lot	45
C. First Street Garage	47
D. Flats on First Street (Residential)	45
E. 22 Hurley (Residential)	42
F. Charles Passage (Residential)	40
G. Cambridge Side Residential	49

With all the 75 First Street rooftop equipment operating in the full capacity condition, all the sound levels at the neighboring properties are predicted to meet the daytime and “other” time sound level limits of the City of Cambridge noise ordinance. We have shaded the results in green to represent that favorable outcome for both conditions.

It is notable that the predicted sound levels include the operation of the generator, which is the predominant source that will operate during daytime hours when it is periodically tested. With the sound emissions of the generator removed, the sound emissions from only the HVAC equipment have a significant margin of comfort while still meeting even the most restrictive Residential Other Times goal of 50 dBA.

CONCLUSIONS

Based on the predictions, we find that the sound emissions from the anticipated rooftop equipment for the 75 First Street project will comply with the City of Cambridge noise regulation and will not adversely impact the surrounding properties.

I trust this summarizes the analysis sufficiently. Please contact me at 857-523-6576 if you have any questions or need further information.

Sincerely,

Architectural Testing, Inc., an Intertek company

Jeffrey Fullerton, INCE Bd. Cert., LEED AP BD+C
Department Manager, Acoustics
Building Science Solutions

Enclosures: Mitsubishi MUZ-HM24NA2 product sheets (3 pages)
Greenheck RVE-40 product sheet (2 pages)
Greenheck CUBE-100-3 product sheet (3 pages)
Kohler 200REOZJF generator data (6 pages)

MUZ-HM24NA2

Outdoor unit model			MUZ-HM24NA
Capacity Rated (Minimum~Maximum)	Cooling *1	Btu/h	22,500 (5,800 - 22,500)
	Heating 47 *1	Btu/h	26,000 (5,400 - 26,000)
Capacity Rated (Maximum)	Heating 17 *2	Btu/h	18,500 (18,500)
Power consumption Rated (Minimum~Maximum)	Cooling *1	W	2,630 (320 - 2,630)
	Heating 47 *1	W	2,500 (320 - 2,500)
Power consumption Rated (Maximum)	Heating 17 *2	W	2,300 (2,300)
EER *1 [SEER] *3	Cooling		8.6 [18.0]
HSPF IV *4	Heating		9.5
COP	Heating *1		3.05
Power factor	Cooling (208/230)	%	99/99
	Heating (208/230)	%	99/99
Power supply	V , phase , Hz		208/230, 1 , 60
Max. fuse size (time delay)	A		15
Min. circuit ampacity	A		14
Fan motor	F.L.A		0.93
Compressor	Model		SNB130FQBMT
	R.L.A		10
	L.R.A		12.5
	Refrigeration oil	fl oz. (L) (Model)	11.8 (0.35) (FV50S)
Refrigerant control			Linear expansion valve
Sound level *1	Cooling	dB(A)	54
	Heating	dB(A)	55
Airflow High - Med. - Low	COOL	CFM	1,742 - 922
	HEAT	CFM	1,691 - 1,691 - 1,372
Fan speed High - Med. - Low	Cooling	rpm	840 - 450
	Heating	rpm	810 - 810 - 650
Defrost method			Reverse cycle
Dimensions	W	in.	33-1/16
	D	in.	13
	H	in.	34-5/8
Weight	lb.		121
External finish			Munsell 3Y 7.8/1.1
Refrigerant piping			Not supplied
Refrigerant pipe size (Min. wall thickness)	Liquid	in.	3/8 (0.0315)
	Gas	in.	5/8 (0.0315)
Connection method	Indoor		Flared
	Outdoor		Flared
Between the indoor & outdoor units	Height difference	ft.	50
	Piping length	ft.	100
Refrigerant charge (R410A)			3 lb. 9 oz.

NOTE: Test conditions are based on AHRI 210/240.

*1: Rating conditions (Cooling) — Indoor: 80°FDB, 67°FWB, Outdoor: 95°FDB, (75°FWB)
(Heating) — Indoor: 70°FDB, 60°FWB, Outdoor: 47°FDB, 43°FWB

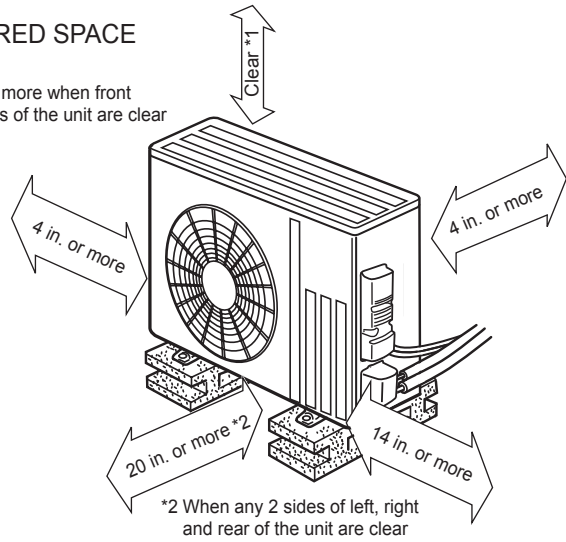
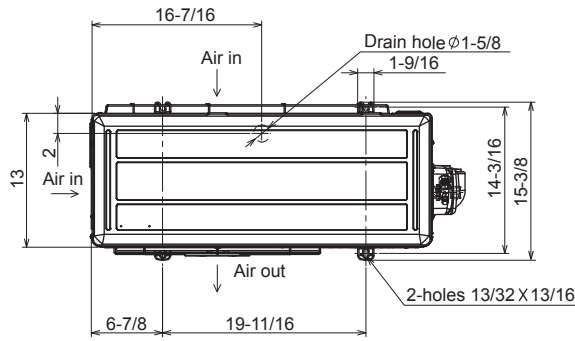
*2: (Heating) — Indoor: 70°FDB, 60°FWB, Outdoor: 17°FDB, 15°FWB

MUZ-HM24NA

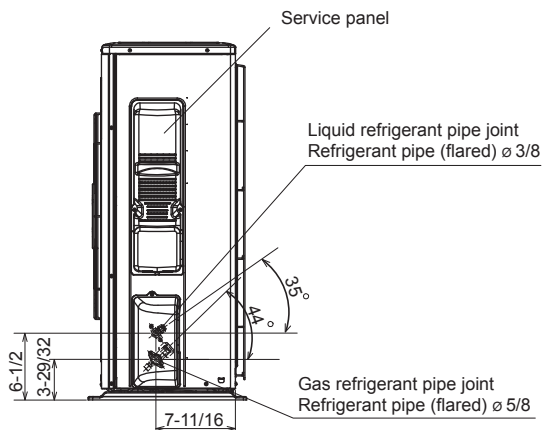
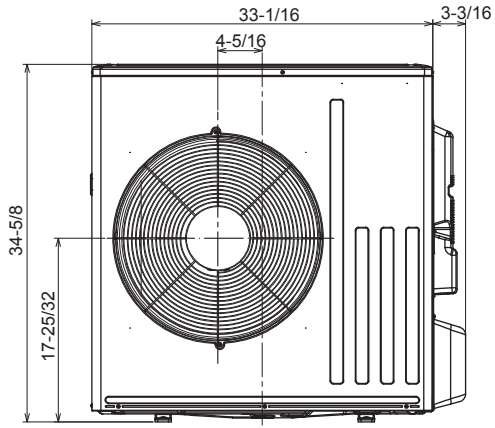
Unit: inch

REQUIRED SPACE

*1 20 in. or more when front and sides of the unit are clear

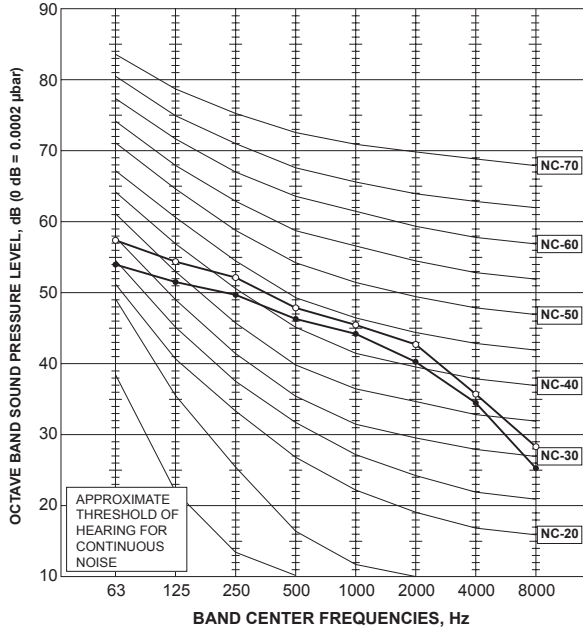


*2 When any 2 sides of left, right and rear of the unit are clear



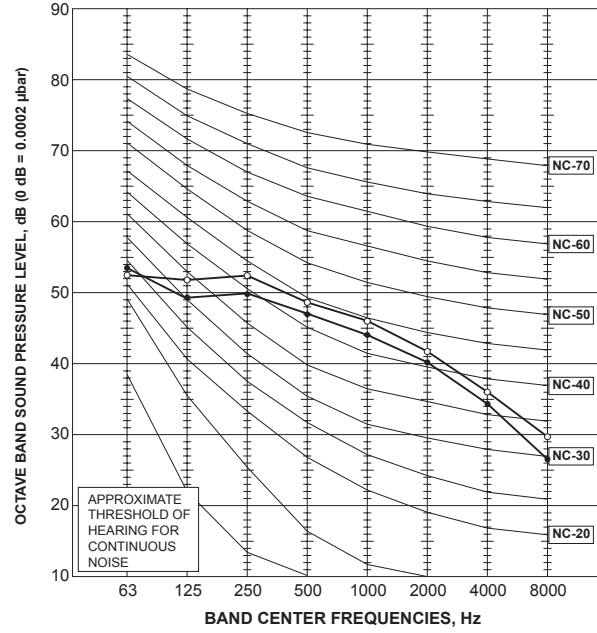
MUZ-HM15NA

NOTCH	SPL(dB(A))	LINE
COOLING	49	●—●
HEATING	51	○—○



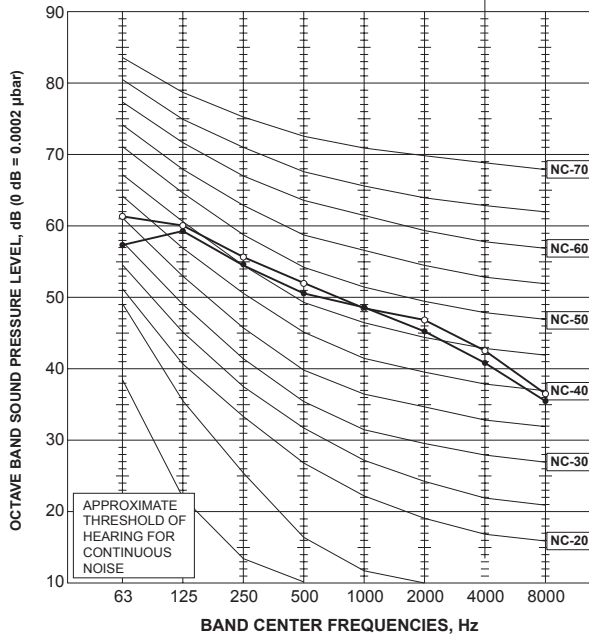
MUZ-HM18NA

NOTCH	SPL(dB(A))	LINE
COOLING	49	●—●
HEATING	51	○—○



MUZ-HM24NA

NOTCH	SPL(dB(A))	LINE
COOLING	54	●—●
HEATING	55	○—○



RVE-40-41-30H-12.5D-G

Unit Performance

Design Conditions						
Elevation (ft)	Summer		Winter DB (F)	Supply (CFM)	Outdoor Air (CFM)	Exhaust Air (CFM)
	DB (F)	WB (F)				
30	90.8	76.2	7.4	3,300	3,300	2,100

Unit Specifications						
Qty	Weight (lb)	Cooling Type	Heating Type	Unit Installation	Unit ETL Listing	Furnace ETL Listing
1	3,503 (+/- 5%)	Packaged DX	Indirect Gas	Outdoor	UL/cUL 1995	ANSI Z83.8 / CSA 2.6

Configuration				
Outdoor Air			Exhaust Air	
Intake	Discharge		Intake	Discharge
End	Side		Non-Access Side	Side

ASHRAE 90.1-2016 Compliance			
	ASHRAE 90.1 Min. Efficiency	Calculated Efficiency	Compliance
ISMRE	5.2	5.5	✓
Enthalpy Recovery Ratio (%)	50	51	✓

Energy Recovery Performance									
Design Condition	Temperature (F)								Capacity Reduction (BTU/h)
	Outdoor Air		Supply Air		Return Air		Exhaust Air		
	DB	WB	DB	WB	DB	WB/RH	DB	WB	
Summer	90.8	76.2	82.6	69.8	75.0	62.5/49.9	87.5	73.5	86,130.0
Winter	7.4	5.3	38.4	32.7	72.0	54.4/30.2	20.5	18.6	110,484.0

Cooling Specifications							
Type	Total Capacity (MBH)	Sensible Capacity (MBH)	Lead Compressor Type	Coil (DB/WB)		Reheat	
				EAT (F)	LAT (F)	Capacity (MBH)	LAT (F)
Packaged DX	158.1	99.7	Digital Scroll	82.6 / 69.8	55.2 / 55.0	72.3	75.4

Heating Specifications								
Type	Gas Type	Input (MBH)	Output (MBH)	Temperature Rise		Turndown	Performance	
				Min (F)	Max (F)		EAT (F)	LAT (F)
Indirect Gas	Natural	200.0	160.0	3.0	45.0	16:1	38.4	83.3

Air Performance							
Type	Total Volume (CFM)	External SP (in. wg)	Total SP (in. wg)	FRPM	Fan		
					Qty	Type	Drive-Type
Supply	3,300	1.5	3.996	3245	1	Plenum	Direct
Exhaust	2,100	1.5	2.575	2446	1	Plenum	Direct

Motor Specifications						
Motor	Qty	Operating Power (hp)	Size (hp)	Enclosure	Efficiency	RPM
Supply	1	3.6	5	ODP	PE	3500
Exhaust	1	1.52	2	ODP	PE	1750

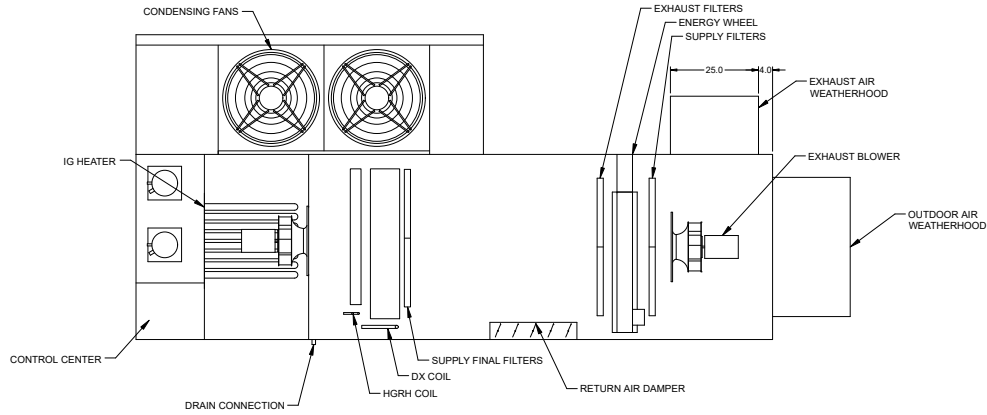
Electrical Specifications			
Power Supply	Rating (V/C/P)	MCA (A)	MOP (A)
Unit	208/60/3	72.6	90.0

Radiated Sound

Position A

Position D

Position B



Plan

Position C

RVE-40: Supply Air Flow Nominal, Largest Tonnage Condensing Section Available, PDX units only

Radiated Sound Levels										
Plane	Octave Bands (Lw)								Plane Lw	Plane LwA
	1	2	3	4	5	6	7	8		
A	73	86	81	79	77	73	69	63	89	82
B	71	79	77	71	69	64	63	55	82	75
C	79	76	69	66	64	59	53	46	81	69
D	74	77	72	72	69	62	58	51	81	74
E	77	84	80	76	76	70	66	60	87	80
Total	83	89	85	82	81	76	72	65	92	85

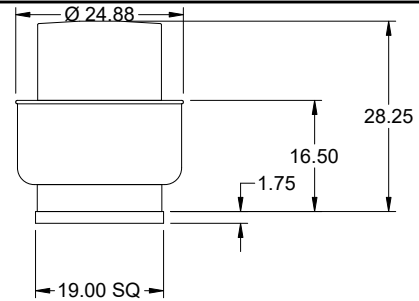
AMCA 320-07 - Laboratory Methods of Sound Testing of Fans Using Sound Intensity
Tests conducted in accordance with this standard.
Free field measurement plane created 1 foot from unit on all sides and top.
Sound Intensity measured in Watts/m ² .
Sound data converted to Sound Power (Lw) for the chart above.
A-Weighted Sound Power was determined using AMCA Standard 301-90 Clause 9.1.

Model: CUBE-100-3

Belt Drive Upblast Centrifugal Roof Exhaust Fan

Previously: CUBE-101-3

Dimensional	
Quantity	1
Weight w/o Acc's (lb)	58
Weight w/ Acc's (lb)	60
Max T Motor Frame Size	56
Standard Curb Cap Size (in.)	19 x 19
Roof Opening (in.)	14.5 x 14.5

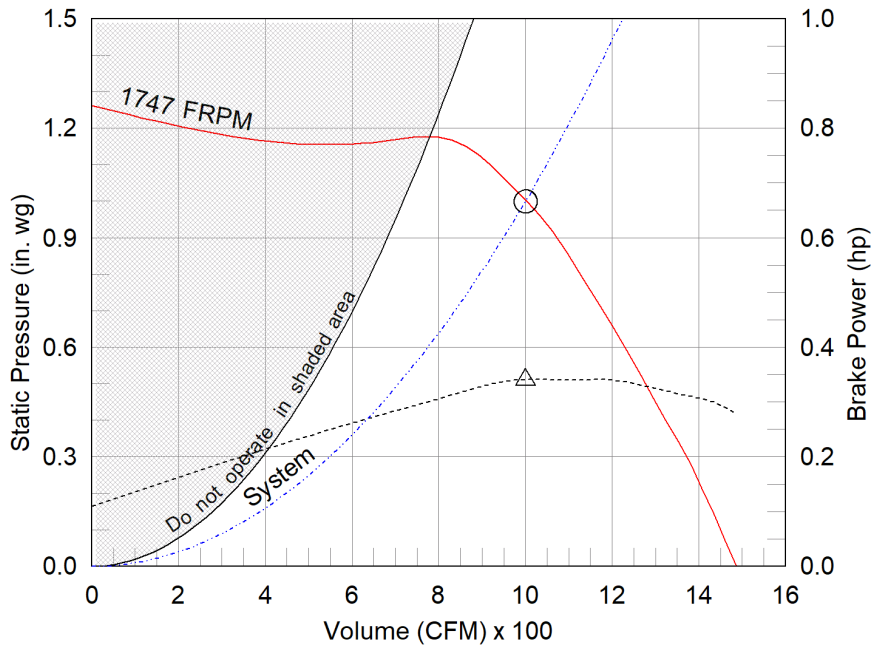


OVERALL HEIGHT MAY BE GREATER DEPENDING ON MOTOR, ADAPTER, AND/OR HINGE BASE.

Performance	
Requested Volume (CFM)	1,000
Actual Volume (CFM)	1,000
Total External SP (in. wg)	1
Fan RPM	1747
Operating Power (hp)	0.34
Elevation (ft)	30
Airstream Temp.(F)	70
Air Density (lb/ft3)	0.075
Drive Loss (%)	10.3
Tip Speed (ft/min)	5,087
Static Eff. (%)	52

Misc Fan Data	
Fan Eff. Index (FEI)	-
Outlet Velocity (ft/min)	781

Motor	
Motor Mounted	Yes
Size (hp)	1/3
Voltage/Cycle/Phase	115/60/1
Enclosure	ODP
Motor RPM	1725
Efficiency Rating	Standard
Windings	1
NEC FLA* (Amps)	7.2
Min. Circuit Ampacity (MCA)	9
Max. Overcurrent Protection (MOP)	15
Short Circuit Current Rtg (SCCR)	5 kA



- △ Operating Bhp point
- Operating point at Total External SP
- Fan curve
- - - System curve
- - - Brake horsepower curve

Notes:

All dimensions shown are in units of in.
 *NEC FLA, MCA and MOP are for reference only – based on tables 430.248 or 430.25 of National Electric Code 2020. Actual motor FLA may vary, for sizing thermal overload, consult factory. MCA and MOP values shown only account for the motor, not accessories (damper actuator, field supplied VFD, etc).
 LwA - A weighted sound power level, based on ANSI S1.4
 dBA - A weighted sound pressure level, based on 11.5 dB attenuation per Octave band at 5 ft - dBA levels are not licensed by AMCA International
 Sones - calculated using ANSI/AMCA 301 at 5 ft

Sound Power by Octave Band

Sound Data	62.5	125	250	500	1000	2000	4000	8000	LwA	dBA	Sones
Inlet	69	73	75	68	61	62	57	52	71	59	9.7



Model: CUBE-100-3

Belt Drive Upblast Centrifugal Roof Exhaust Fan

Standard Construction Features:

- Aluminum housing - Backward inclined aluminum wheel - Curb cap with prepunched mounting holes - Motor and drives isolated on shock mounts - Drain trough - Ball bearing motors - Adjustable motor pulley - Adjustable motor plate - Fan shaft mounted in ball bearing pillow blocks - Bearings meet or exceed temperature rating of fan - Static resistant belts - Corrosion resistant fasteners - Internal lifting lugs

Selected Options & Accessories:

Standard Curb Cap Size - 19 Square
UL/cUL 705 Listed - "Power Ventilators"
Switch, NEMA-1, Toggle, Shipped with Unit
Junction Box Mounted & Wired
Unit Warranty: 1 Yr (Standard)

AMCA



AMCA Licensed for Sound and Air Performance. Power rating (BHP/kW) includes transmission losses.

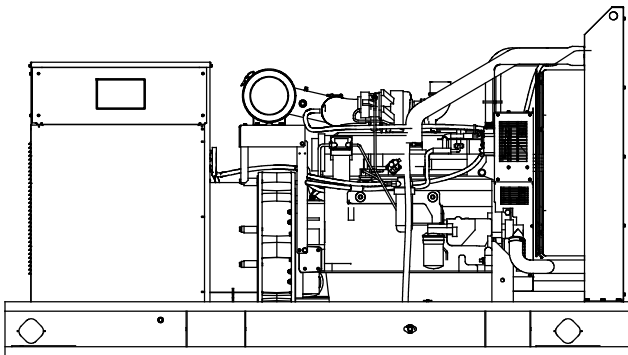
Greenheck Fan Corporation certifies that the model shown herein is licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program. Performance certified is for installation type A: Free inlet, Free outlet. Power rating (BHP/kW) includes transmission losses. Performance ratings do not include the effects of appurtenances (accessories). The sound ratings shown are loudness values in fan sones at 5 ft. (1.5 m) in a hemispherical free field calculated per ANSI/AMCA Standard 301. Values shown are for installation type A: free inlet hemispherical sone levels. dBA levels are not licensed by AMCA International. The AMCA Certified Ratings Seal applies to some ratings only.



Tier 3 EPA-Certified for Stationary Emergency Applications

Ratings Range

		60 Hz
Standby:	kW	168- 200
	kVA	195- 250
Prime:	kW	158- 180
	kVA	175- 225



Generator Set Ratings

Alternator	Voltage	Ph	Hz	130° C Rise Standby Rating		105° C Rise Prime Rating	
				kW/kVA	Amps	kW/kVA	Amps
4S13X	120/208	3	60	184/230	638	173/216	600
	127/220	3	60	194/243	636	180/225	590
	120/240	3	60	184/230	553	173/216	520
	139/240	3	60	200/250	601	180/225	541
	220/380	3	60	168/210	319	158/198	300
	277/480	3	60	200/250	301	180/225	271
4UA9	120/208	3	60	200/250	694	180/225	625
	127/220	3	60	200/250	656	180/225	590
	120/240	3	60	200/250	601	180/225	541
	139/240	3	60	200/250	601	180/225	541
	220/380	3	60	200/250	380	180/225	342
	277/480	3	60	200/250	301	180/225	271
	347/600	3	60	200/250	241	180/225	217
4UA13	120/208	3	60	200/250	694	180/225	625
	127/220	3	60	200/250	656	180/225	590
	120/240	3	60	200/250	601	180/225	541
	120/240	1	60	195/195	813	175/175	729
	139/240	3	60	200/250	601	180/225	541
	220/380	3	60	200/250	380	180/225	342
	277/480	3	60	200/250	301	180/225	271
	347/600	3	60	200/250	241	180/225	217

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. *Standby Ratings:* The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. *Prime Power Ratings:* At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO-8528-1 and ISO-3046-1. For limited running time and continuous ratings, consult the factory. Obtain technical information bulletin (TIB-101) for ratings guidelines, complete ratings definitions, and site condition derates. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever.

Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The 60 Hz generator set offers a UL 2200 listing.
- The generator set accepts rated load in one step.
- The 60 Hz generator set meets NFPA 110, Level 1, when equipped with the necessary accessories and installed per NFPA standards.
- A one-year limited warranty covers all generator set systems and components. Two- and five-year extended limited warranties are also available.
- Alternator features:
 - The unique Fast-Response® X excitation system delivers excellent voltage response and short-circuit capability using a rare-earth, permanent magnet (PM)-excited alternator. (4S13X alternator)
 - The unique Fast-Response® II excitation system delivers excellent voltage response and short-circuit capability using a permanent magnet (PM)-excited alternator. (4UA9 and 4UA13 alternators)
 - The brushless, rotating-field alternator has broadrange reconnectability.
- Other features:
 - Kohler designed controllers for one-source system integration and remote communication. See Controllers on page 3.
 - The low coolant level shutdown prevents overheating (standard on radiator models only).
 - Integral vibration isolation eliminates the need for under-unit vibration spring isolators.
 - Multiple circuit breaker configurations.
 - Mount up to three circuit breakers to allow circuit protection of selected priority loads.

Alternator Specifications

Specifications	Alternator
Manufacturer	Kohler
Type	4-Pole, Rotating-Field
Exciter type	Brushless, Permanent-Magnet
Leads: quantity, type 4SX, 4UA	12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation:	NEMA MG1
Material	Class H
Temperature rise	130°C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Amortisseur windings	Full
Voltage regulation, no-load to full-load	Controller Dependent
One-step load acceptance	100% of Rating
Unbalanced load capability	100% of Rated Standby Current

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and dripproof construction.
- Windings are vacuum-impregnated with epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.

Specifications	Alternator
Peak motor starting kVA:	(35% dip for voltages below)
480 V 4S13X (12 lead)	570
480 V 4UA9 (12 lead)	700
480 V 4UA13 (12 lead)	960

Application Data

Engine

Engine Specifications	
Manufacturer	John Deere
Engine model	6068HFG85A
Engine type	4-Cycle, Turbocharged, Charge Air-Cooled
Cylinder arrangement	6 Inline
Displacement, L (cu. in.)	6.8 (415)
Bore and stroke, mm (in.)	106 x 127 (4.19 x 5.00)
Compression ratio	17.0:1
Piston speed, m/min. (ft./min.)	457 (1500)
Main bearings: quantity, type	7, Replaceable Insert
Rated rpm	1800
Max. power at rated rpm, kWm (BHP)	235 (315)
Cylinder head material	Cast Iron
Crankshaft material	Forged Steel
Valve material:	
Intake	Chromium-Silicon Steel
Exhaust	Stainless Steel
Governor: type, make/model	JDEC Electronic L14 Denso HP3
Frequency regulation, no-load to full-load	Isochronous
Frequency regulation, steady state	±0.25%
Frequency	Fixed
Air cleaner type, all models	Dry

Engine Electrical

Engine Electrical System	
Battery charging alternator:	24 Volt
Ground (negative/positive)	Negative
Volts (DC)	24
Ampere rating	45
Starter motor rated voltage (DC)	24
Battery, recommended cold cranking amps (CCA):	
Quantity, CCA rating each	Two, 950
Battery voltage (DC)	12

Fuel

Fuel System	
Fuel supply line, min. ID, mm (in.)	11.0 (0.44)
Fuel return line, min. ID, mm (in.)	6.0 (0.25)
Max. lift, fuel pump: type, m (ft.)	Mechanical, 1.8 (6.0)
Max. fuel flow, Lph (gph)	92.7 (24.5)
Max. return line restriction, kPa (in. Hg)	20 (5.9)
Fuel prime pump	Manual
Fuel filter	
Primary	30 Microns
Secondary	2 Microns @ 98% Efficiency
Water Separator	Yes
Recommended fuel	#2 Diesel

Exhaust

Exhaust System	
Exhaust manifold type	Dry
Exhaust flow at rated kW, m ³ /min. (cfm)	42.8 (1510)
Exhaust temperature at rated kW, dry exhaust, °C (°F)	527 (980)
Maximum allowable back pressure, kPa (in. Hg)	Min. 4 (1.2) Max. 10 (3.0)
Exhaust outlet size at engine hookup, mm (in.)	98 (3.86)

Lubrication

Lubricating System	
Type	Full Pressure
Oil pan capacity, L (qt.) §	32.5 (34.4)
Oil pan capacity with filter, L (qt.) §	33.4 (35.3)
Oil filter: quantity, type §	1, Cartridge
Oil cooler	Water-Cooled
§ Kohler recommends the use of Kohler Genuine oil and filters.	

Application Data

Cooling

Radiator System

Ambient temperature, °C (°F) *	50 (122)
Engine jacket water capacity, L (gal.)	11.3 (3.0)
Radiator system capacity, including engine, L (gal.)	27.6 (7.3)
Engine jacket water flow, Lpm (gpm)	230.9 (61)
Heat rejected to cooling water at rated kW, dry exhaust, kW (Btu/min.)	94.2 (5360)
Heat rejected to air charge cooler at rated kW, dry exhaust, kW (Btu/min.)	56.1 (3190)
Water pump type	Centrifugal
Fan diameter, including blades, mm (in.)	787 (31)
Fan, kWm (HP)	8.6 (11.5)
Max. restriction of cooling air, intake and discharge side of radiator, kPa (in. H ₂ O)	0.125 (0.5)

* Enclosure with enclosed silencer reduces ambient temperature capability by 5°C (9°F).

Operation Requirements

Air Requirements

Radiator-cooled cooling air, m ³ /min. (scfm) ‡	368.1 (13000)
Combustion air, m ³ /min. (cfm)	17.6 (620)
Heat rejected to ambient air:	
Engine, kW (Btu/min.)	46.9 (2670)
Alternator, kW (Btu/min.)	18.5 (1050)

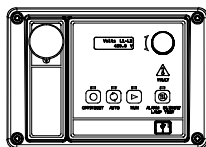
‡ Air density = 1.20 kg/m³ (0.075 lbm/ft³)

Fuel Consumption

Diesel, Lph (gph) at % load	Standby Rating	
100%	58.0	(15.3)
75%	43.3	(11.4)
50%	31.4	(8.3)
25%	19.7	(5.2)

Diesel, Lph (gph) at % load	Prime Rating	
100%	50.1	(13.2)
75%	36.1	(9.5)
50%	25.7	(6.8)
25%	16.6	(4.4)

Controllers

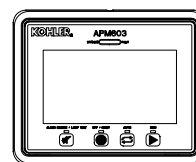


APM402 Controller

Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.

- Digital display and menu control provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or serial configuration
- Controller supports Modbus® protocol
- Integrated hybrid voltage regulator with ±0.5% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-161 for additional controller features and accessories.

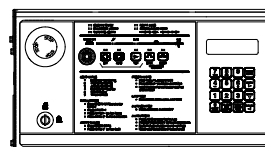


APM603 Controller

Provides advanced control, system monitoring, and system diagnostics for optimum performance and compatibility.

- 7-inch graphic display with touch screen and menu control provides easy local data access
- Measurements are selectable in metric or English units
- Paralleling capability to control up to 8 generators on an isolated bus with first-on logic, synchronizer, kW and kVAR load sharing, and protective relays
- Note: Parallel with other APM603 controllers only
- Generator management to turn paralleled generators off and on as required by load demand
- Load management to connect and disconnect loads as required
- Controller supports Modbus® RTU, Modbus® TCP, SNMP and BACnet®
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- UL-listed overcurrent protective device
- NFPA 110 Level 1 capability

Refer to G6-162 for additional controller features and accessories.



Decision-Maker® 6000 Paralleling Controller

Provides advanced control, system monitoring, and system diagnostics with remote monitoring capabilities for paralleling multiple generator sets.

- Paralleling capability to control up to 8 generators on an isolated bus with first-on logic, synchronizer, kW and kVAR load sharing, and protective relays
- Note: Parallel with other Decision-Maker® 6000 controllers only
- Digital display and keypad provide easy local data access
- Measurements are selectable in metric or English units
- Remote communication thru a PC via network or modem configuration
- Controller supports Modbus® protocol
- Integrated voltage regulator with ±0.25% regulation
- Built-in alternator thermal overload protection
- NFPA 110 Level 1 capability

Refer to G6-107 for additional controller features and accessories.

Modbus® is a registered trademark of Schneider Electric.

BACnet® is a registered trademark of ASHRAE.

Standard Features

- Alternator Protection
- Battery Rack and Cables
- Customer Connection
(standard with Decision-Maker® 6000 controller only)
- Local Emergency Stop Switch
- Oil Drain Extension
- Operation and Installation Literature

Available Options

Circuit Breakers

Type

- | | |
|---|--|
| <input type="checkbox"/> Magnetic Trip | <input type="checkbox"/> 80% |
| <input type="checkbox"/> Thermal Magnetic Trip | <input type="checkbox"/> 100% |
| <input type="checkbox"/> Electronic Trip (LI) | |
| <input type="checkbox"/> Electronic Trip with Short Time (LSI) | <input type="checkbox"/> Manual |
| <input type="checkbox"/> Electronic Trip with Ground Fault (LSIG) | <input type="checkbox"/> Electrically Operated (for paralleling) |

Operation

Circuit Breaker Mounting

- Generator Mounted
- Remote Mounted
- Bus Bar (for remote mounted breakers)

Enclosures for Remote Mounted Circuit Breakers

- NEMA 1
- NEMA 3R

Approvals and Listings

- California OSHPD Approval
- CSA Certified
- IBC Seismic Certification
- UL 2200 Listing
- Hurricane Rated Enclosure

Enclosed Unit

- Sound Enclosure (with enclosed critical silencer)
- Weather Enclosure (with enclosed critical silencer)

Open Unit

- Exhaust Silencer, Critical (kit: PA-354809)
- Flexible Exhaust Connector, Stainless Steel

Fuel System

- Flexible Fuel Lines
- Fuel Pressure Gauge
- Subbase Fuel Tanks

Controller

- Common Failure Relay
(Decision-Maker® 6000 and APM603 controllers only)
- Decision-Maker® Paralleling System (DPS)
(Decision-Maker® 6000 controller only)
- Dry Contact (isolated alarm)
(Decision-Maker® 6000 controller only)
- Two Input/Five Output Module (APM402 controller only)
- Four Input/Fifteen Output Module (APM603 controller only)
- Lockable Emergency Stop Switch
- Remote Emergency Stop Switch
- Remote Serial Annunciator Panel
- Run Relay (standard with APM603, optional with others)
- Manual Key Switch (APM603 controller only)
- Manual Speed Adjust (APM402 controller only)

Cooling System

- Block Heater, 1800 W, 90-120 V, 1 Ph
- Block Heater, 2000 W, 190-240 V, 1 Ph
Required for ambient temperature below 0°C (32°F)
- Radiator Duct Flange

Electrical System

- Generator Heater
- Battery
- Battery Charger, Equalize/Float Type
- Battery Heater

Miscellaneous

- Air Cleaner, Heavy Duty
- Air Cleaner Restriction Indicator
- Certified Test Report
- Crankcase Emissions Canister
- Engine Fluids Added
- Rated Power Factor Testing
- Rodent Guards

Literature

- General Maintenance
- NFPA 110
- Overhaul
- Production

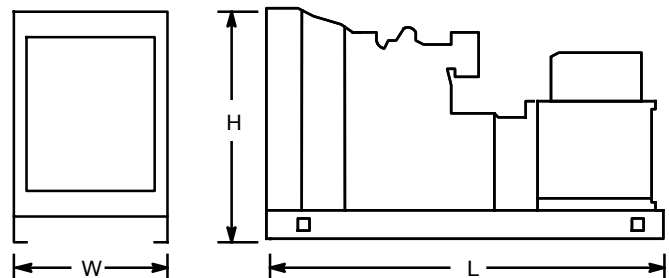
Warranty

- 2-Year Basic Limited Warranty
- 5-Year Basic Limited Warranty
- 5-Year Comprehensive Limited Warranty

Dimensions and Weights

Overall Size, L x W x H, mm (in.): 3000 x 1300 x 1672
 (118.1 x 51.2 x 65.8)

Weight (radiator model), wet, kg (lb.): 1923 (4240)



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

DISTRIBUTED BY:

TECHNICAL INFORMATION BULLETIN

Generator Set Sound Data Sheet

			Sound Pressure Data in dB(A)			
Generator Set Model	Hz	Load	Raw Exhaust	Open Unit, Isolated Exhaust	Weather Enclosure	Sound Enclosure
200REOZJF	60	100% Load	116.5	89.3	87.4	73.7
		No Load	107.0	89.2	87.3	70.6

Note: Sound pressure data is the logarithmic average of eight perimeter measurement points at a distance of 7 m (23 ft.), except Raw Exhaust data which is a single measurement point at 1 m (3.3 ft.) from the mouth of a straight pipe exhaust.

200REOZJF	60 Hz
------------------	--------------

Load	Distance, m (ft)	Enclosure	Measurement Clock Position	Sound Pressure Levels, dB(A)								Overall Level
				Octave Band Center Frequency (Hz)								
				63	125	250	500	1000	2000	4000	8000	
100% Load	7 (23)	Sound	3:00	58.8	63.4	63.8	70.3	63.7	64.4	61.7	54.0	73.6
			1:30	58.0	62.4	66.1	69.3	62.0	62.8	54.8	48.3	72.7
			12:00 Engine	56.1	62.2	65.5	68.5	64.6	63.5	60.9	52.6	72.9
			10:30	59.9	65.0	67.8	70.8	65.7	63.7	61.1	54.2	74.7
			9:00	60.5	65.1	66.1	71.0	63.7	65.1	61.2	53.0	74.6
			7:30	60.8	66.0	66.4	65.9	64.7	63.4	57.9	50.9	72.9
			6:00 Alternator	62.6	67.5	71.2	67.7	63.5	61.5	59.6	51.6	75.0
			4:30	59.5	64.1	66.6	65.7	65.1	63.2	59.1	51.5	72.6
			8-pos. log avg.	59.9	64.8	67.2	69.1	64.2	63.6	60.0	52.3	73.7

Load	Distance, m (ft)	Enclosure	Measurement Clock Position	Sound Pressure Levels, dB(A)								8-pos. log avg.
				3:00	1:30	12:00 Eng.	10:30	9:00	7:30	6:00 Alt.	4:30	
100% Load	7 (23)	Weather	Overall Levels	86.8	88.8	81.7	88.8	89.3	86.5	85.0	87.9	87.4

Load	Distance, m (ft)	Enclosure	Measurement Clock Position	Sound Pressure Levels, dB(A)								Overall Level
				Octave Band Center Frequency (Hz)								
				63	125	250	500	1000	2000	4000	8000	
100% Load	7 (23)	Open Unit, Isolated Exhaust	3:00	59.0	72.0	79.2	78.1	82.2	82.5	81.4	75.5	88.7
			1:30	58.5	70.4	78.8	79.6	85.3	85.7	82.6	77.0	90.7
			12:00 Engine	55.5	64.8	72.7	76.7	77.6	76.5	74.4	68.6	83.6
			10:30	57.2	69.2	81.6	81.0	85.9	85.3	82.3	77.6	90.7
			9:00	56.5	70.8	84.8	82.3	83.1	84.4	81.8	76.7	91.2
			7:30	56.0	69.7	76.8	78.9	83.2	82.6	80.9	76.6	88.4
			6:00 Alternator	58.6	71.1	80.3	81.6	81.8	78.1	73.9	67.0	86.9
			4:30	62.4	74.6	81.3	81.5	84.9	82.5	80.1	74.2	89.8
			8-pos. log avg.	58.5	71.0	80.6	80.3	83.6	83.1	80.6	75.3	89.3

Load	Distance, m (ft)	Exhaust	Measurement Clock Position	Sound Pressure Levels, dB(A)								Overall Level
				Octave Band Center Frequency (Hz)								
				63	125	250	500	1000	2000	4000	8000	
100% Load	1 (3.3)	Raw Exhaust (No Silencer)		82.8	94.7	100.5	105.1	109.7	111.6	110.5	108.1	116.5

The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. © 2014 by Kohler Co. All rights reserved.

200REOZJF	60 Hz
------------------	--------------

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Enclosure	Measurement Clock Position	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
No Load	7 (23)	Sound	3:00	47.0	55.4	61.7	68.0	60.7	64.8	60.8	53.2	71.4
			1:30	42.6	52.0	58.7	63.2	59.8	59.4	52.9	45.6	67.1
			12:00-Engine	45.9	53.7	63.4	62.6	61.8	63.1	60.6	51.0	69.6
			10:30	47.0	55.0	63.2	67.2	63.8	63.7	60.9	53.1	71.4
			9:00	48.0	55.6	64.3	65.6	61.7	65.2	60.8	51.1	71.1
			7:30	48.8	53.9	61.4	63.0	61.4	62.8	57.2	49.4	68.8
			6:00-Alternator	50.4	58.0	70.3	62.7	62.1	61.8	59.6	50.2	72.5
			4:30	48.2	55.7	66.4	63.0	61.8	62.9	58.1	49.9	70.4
8-pos. log avg.			47.7	55.2	65.1	65.0	61.8	63.3	59.5	50.9	70.6	

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Enclosure	Measurement Clock Position	3:00	1:30	12:00 Eng.	10:30	9:00	7:30	6:00 Alt.	4:30	8-pos. log avg.
No Load	7 (23)	Weather	Overall Levels	84.9	88.8	83.4	89.6	88.7	86.2	84.3	88.0	87.3

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Enclosure	Measurement Clock Position	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
No Load	7 (23)	Open Unit, Isolated Exhaust	3:00	47.6	63.5	80.3	77.2	80.8	81.0	78.2	73.3	86.8
			1:30	49.5	63.3	76.8	80.0	87.2	85.1	81.8	76.6	90.7
			12:00-Engine	51.0	61.5	71.6	76.2	80.2	79.1	76.3	72.0	85.3
			10:30	49.2	62.7	81.7	81.6	85.4	85.4	82.2	76.9	91.5
			9:00	49.4	64.8	85.8	82.2	82.1	83.0	80.2	74.8	90.6
			7:30	49.6	65.6	78.2	79.1	82.2	82.4	79.4	75.1	88.1
			6:00-Alternator	48.7	66.0	81.3	80.4	80.6	75.6	71.6	64.3	86.2
			4:30	52.2	66.8	84.3	81.7	83.2	82.4	78.7	73.3	89.9
8-pos. log avg.			49.9	64.6	81.6	80.2	83.4	82.6	79.5	74.4	89.2	

				Sound Pressure Levels, dB(A)								
Load	Distance, m (ft)	Exhaust	Measurement Clock Position	Octave Band Center Frequency (Hz)								Overall Level
				63	125	250	500	1000	2000	4000	8000	
No Load	1 (3.3)	Raw Exhaust (No Silencer)		79.6	91.4	96.0	100.7	100.3	98.9	97.1	92.6	107.0

MEMORANDUM

DATE: November 18, 2022
TO: Jim Wilcox, Cambridge Department of Public Works
FROM: Brad Johnson, P.E.
RE: 75-85 First Street, Cambridge, MA 02141
Existing Floodplain and Climate Change Vulnerability Assessment

Bohler Engineering MA, LLC (Bohler) is providing this memorandum to document the existing and future floodplain elevations and proposed conditions for 75-85 First Street Project (the "Project"). The Project is located on Map 18, Lots 64 and 65.

Existing Floodplain

Based on the publicly available Federal Emergency Management Agency (FEMA) National Flood Hazard Layer FIR Mette, the Project is not located within a mapped floodplain. A FIRMette figure with the Project site noted is attached.

Climate Change Vulnerability Assessment – Precipitation

Based on the publicly available Climate Change Vulnerability Assessment (CCVA) and the Cambridge FloodViewer 2022, the Project is projected to experience the below flood elevations during the 100-year precipitation event in 2030 and 2070. Elevations shown are in Cambridge City Base.

Table 1: 100-Year Precipitation Event Flooding (2030 and 2070)

	Year 2030	Year 2070
75 First Street (Map 18/Lot 64)	20.4	20.6
85 First Street (Map 18/Lot 65)	20.4	20.5

Climate Change Vulnerability Assessment – Sea Level Rise & Storm Surge (2070)

Table 2: 100-Year Sea Level Rise & Storm Surge (2070)

	Year 2070
75 First Street (Map 18/Lot 64)	23.5
85 First Street (Map 18/Lot 65)	23.5

Project Resiliency

The finish floor elevation (FFE) of the proposed building will be approximately El. 21.0±. Additionally, no dwelling units are proposed on the first-floor level. As such, the 100-yr 2030 and 2070 precipitation events will not result in a flood elevation above the FFE. In order to prevent flooding of the building during the 2070 100-year sea level rise and storm surge event, mitigation measures will be put in place. This includes the installation of sand bags, or similar, around each door or entrance to the building; the use of a stormwater pump to protect ground-level electrical equipment; and gasketed doorways for all first-floor doors. A supply of sand bags, or similar, will be kept on-site. It is anticipated that these measures will be sufficient to prevent flooding of the proposed building during the 2070 100-year sea level rise and storm surge event.



LEGEND:



SITE

FIRMETTE EXHIBIT

75 & 85 FIRST STREET
CAMBRIDGE, MA

PREPARED BY

BOHLER //

SCALE: 1"=500' DATE: 07/12/2022

SOURCE: FEDERAL EMERGENCY MANAGEMENT AGENCY

Stormwater Management Plan Checklist

Stormwater Management Plan Checklist
Page 1 of 3

Please prepare one (1) electronic copy of the Stormwater Management Plan to be included in the Application Package. Adhere to the Drawing and Map standards described in the Stormwater Control Permit Checklist and use this checklist to be sure Plan is complete. You must sign and date this checklist and attach to completed Plan for submittal.

Plan Cover Sheet

- Title - *Stormwater Management Plan*
- Project Name
- Project Location
- Assessor Parcel Number
- Stormwater Control Permit Number
- Designer or Other Firm Name and Contact Information
- Applicant Name
- Applicant Address, Phone Number, E-mail Address
- Owner Name
- Owner Address, Phone Number, E-mail Address
- Pre- and Post-Development Site Imperviousness

Submission Requirements

Unless otherwise noted or waived by the Cambridge DPW, all items listed below are required to be submitted as part of this Plan for the application package to be considered complete.

Narrative:

- Briefly describe the nature and purpose of the land development activity, and the area (square feet) to be disturbed. Clearly identify the impact on all thresholds outlined in the Stormwater Control Regulations and Section 3.1 of the Wastewater and Stormwater Management Guidance document (draft).
- Identify the watershed in which the site is located, the receiving waters to which the site stormwater drains, and pollutants of concern (consult the City's Wastewater and Stormwater Management Guidance document and the most recent Massachusetts Integrated List of Waters which can be found at <http://mass.gov/dep/water/resources/tmdls.htm>).
- Describe the existing topography, vegetation, site use, drainage pattern(s), and outfall(s)/discharge points.
- Provide current site impervious area measurements and describe any changes in impervious area. Identify Low Impact Development Techniques to be used, if any.
- Describe neighboring areas such as streams, residential areas, roads, etc. which might be affected by the project's development. Describe how adjacent properties and the City right of way will be impacted by runoff from the site.
- Provide boring logs with profiles, groundwater elevation, and percolation tests to determine on-site infiltration.
- The opinion of a Licensed Site Professional (LSP) may be required to determine if site infiltration is appropriate.
- Describe methods that will be used to maximize groundwater recharge.

Stormwater Management Plan Checklist

Page 2 of 3

- Provide research results for the site addressing previous use, history of spills, hazardous wastes, etc.). Include information on any Activity and Use Limitation (AUL) that precludes inducing runoff to the groundwater pursuant to MGL Chapter 21E and the Massachusetts Contingency Plan, 310 CMR 40.0000. Resources include the MassDEP's webpage for site locations of cleanup and spills: <http://www.mass.gov/dep/cleanup/sitesloc.htm> and two regulated areas MassGIS layers - *MassDEP Tier Classified Chapter 21E sites* layer and *MassDEP Oil and/or Hazardous Material Sites with Activity and Use Limitation (AUL)*. MassGIS layer list webpage: <https://docs.digital.mass.gov/dataset/massgis-data-massdep-oil-andor-hazardous-material-sites-activity-and-use-limitations-aul>
- Describe the proposed site conditions with regard to site use, drainage design and peak runoff rates, and proposed outfalls/discharge points.
- Identify all source controls that will be used to mitigate pollutant parameters. Label and individually reference each source control on site.
- Identify the prescribed treatment train(s) and the proposed BMPs to be used on site. Provide an overview of the stormwater's path through the on-site BMPs. Provide specific information on how pathogens, nutrients, and other priority pollutants will be mitigated. Provide a description as to where BMPs will be located.
- For all BMPs installed to address Phosphorous reduction describe the BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated phosphorous removed in mass per year by the BMP.
- Also include any site uses the proponent wishes to be allowed to accommodate within the project at any time in the future.

Site Locus Map:

- An accurately scaled boundary map of the development lot or parcel(s) which is subject of the permit application, and all receiving waters that parcel(s) and its stormwater runoff drain to.

Site Plan:

- Adhere to the following datum standards: Horizontal – NAD 1983 State Plane Massachusetts Mainland (feet). Vertical – Cambridge City base (10.84 feet above mean sea level NGVD 1929).
- A site plan of the development parcel or lots, drawn to scale, and differentiate between existing and proposed items.
- Include the existing conditions on the subject parcel or lot and on lots abutting or directly across the street from the subject parcel or lot.
- Include all existing and proposed utilities (above and below ground),
- Include all existing BMPs and contours.
- Include the location of proposed buildings and any existing buildings to remain, proposed vegetation and existing vegetation to be retained.
- Include the location of parking spaces, driveways, proposed or altered curb cuts and walkways.
- Include the proposed treatment of the perimeter of the site including techniques and materials to be used (e.g. screens, fences, walls, landscaping, etc.).
- Show location of proposed permanent structural and non-structural BMPs with identification. Label BMPs or use an identification system which corresponds with the narrative section.
- Show proposed contours (1 ft.) and new drainage patterns (flow direction arrows).
- Include the location of required open space and the location of any easements or rights of way. *[The location of all proposed open space shall be specifically identified on the plan through distinctive shading or other appropriate technique.]*

Permits:

- A list of all permits (local, state, and federal), including any special permits and variances, obtained for this project (include permit numbers).

Owner of Record:

- Completion of the Owner of Record information on the Land Disturbance Permit Application, a copy of the recorded deed for the applicable lot or parcel, and a list of any special permits or variances granted for the site.

Flood Plain Plans (if applicable):

- Plans, elevations, cross sections showing new building construction, proposed flood water retention systems, and other flood control systems. [Suggested scale of 1"=20'] (Flood Plain Special Permit required).
- Plans must include existing and proposed contours (at one-foot intervals) and spot elevations with those areas proposed to be filled, excavated, or otherwise physically altered within the 100 year flood line as determined by the regulated flood elevation for the 100 year flood plain, Zone A as determined by the relevant Flood Insurance Flood Map.

Drainage Report:

- Include calculations which illustrate compliance with the Stormwater Standards outlined in the Wastewater and Stormwater Management Guidance document.
- Include calculations and hydrographs for pre- and post-development runoff.
- Include calculations supporting the design of the proposed BMPs and any flood control systems. For any BMP listed in Attachment 3 to Appendix F of the 2016 Massachusetts Small MS4 General Permit that is proposed to treat phosphorus include calculations per Attachment 1 to Appendix F (see <https://www3.epa.gov/region1/npdes/stormwater/ma/2016fpd/appendix-f-2016-ma-sms4-gp.pdf>). For BMPs not listed submit phosphorous reduction calculations per best engineering practices.

Wetland Protection Act (if applicable):

- Completion of the Wetland Protection Act Environmental Data Form information as required by the Cambridge Conservation Commission for a Notice of Intent.

Summary of Non-Applicable Items:

- Clearly identify and explain any items which are not applicable to the project. Applicant should cite references.

Applicant's Certification

I, the undersigned, hereby certify that the attached Stormwater Management Plan submittal includes all items required by the City of Cambridge's Stormwater Control Regulations. I understand that if any of the items required are found to be missing from the submittal, the Stormwater Management Plan will not be acceptable for review and will be returned as incomplete. The applicant is aware of these criteria and will accept all responsibility for delays due to incomplete submittals. I am enclosing an explanation for each item which I feel is not required and, therefore, have not been included in this submittal package.

Applicant's Signature: _____

Jeff Hirsch - duly authorized for
US Parcel E, LLC and US
Parcel D-2, LLC

Date: 7/13/22

STORMWATER MANAGEMENT PLAN

**US PARCEL E, LLC
75 & 85 First Street**

**Map 10, Lot 65; Map 18, Lot 64
Cambridge, Massachusetts**

July 22, 2022

Owner/Applicant:

US Parcel E, LLC
c/o Jeff Hirsch
111 First Street
Cambridge, MA 02141
(617) 868-5558
jhirsch@urbanspacesllc.com

Prepared By:

Bohler
45 Franklin Street, 5th Floor
Boston, MA 02110

Project No. MAB220072
Stormwater Control Permit No. _____

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1.1 Project Introduction 3
2.1 Drainage Analysis 3
 2.1.1 Summary 3
 2.1.2 Stormwater Model Methodology..... 3
 2.1.3 Existing Hydrologic Model 4
 2.1.4 Proposed Hydrologic Model 4
 2.1.5 Conclusions 5
3.1 List of Permits..... 5
4.1 Summary of Non-Applicable Items..... 5

APPENDICES

Appendix A: USGS Locus Map

Appendix B: MassDEP Site History

Appendix C: Owner of Record Information

Appendix D: FEMA Firmette and CCVA Elevations

Appendix E: Geotechnical Report

Appendix F: Rainfall Data

Appendix G: Pre-development Drainage Map and HydroCAD Report

Appendix H: Post-development Drainage Map, HydroCAD Report, and Calculations

1.1 **Project Introduction**

US Parcel E, LLC, the Project Proponent, is proposing to redevelop 75 First Street (Map 18, Lot 64), referred to as “Parcel E”, and a portion of 85 First Street (Map 10, Lot 65), referred to as “Parcel D” (collectively, the “Site”). The remaining portion of Parcel D has been recently redeveloped into a one-story, multi-unit commercial building and not included as part of this project.

The existing 0.37± acre Site currently contains an approximately 7,100± SF one-story retail building with 2,650± SF parking area (located on Parcel E) and an approximately 5,810± SF parking lot (located on Parcel D). The Site is bounded by Hurley Street to the south, Spring Street to the north, First Street to the east, and an abutting two-story office building to the west.

The proposed project involves razing the existing building on Parcel E and constructing an approximately 77,000± SF gross floor area, six-story, mixed-use building (the “Project”). The building footprint will cover the entirety of Parcel E and will be constructed over the existing parking lot on Parcel D. There will be no change in the amount of impervious area on-Site. Additional project components include new utility services and the expansion of the existing Parcel D subsurface infiltration system. The proposed 0.37± acres of land disturbance is not anticipated to affect any adjacent properties and will not exceed one acre.

The Project includes several soil erosion and sediment control measures to be utilized during the construction period. These measures include the installation of a perimeter siltation barrier, temporary catch basin filter sacks, and stockpile protections. During construction, the contractor will be responsible for maintaining safe site access.

2.1 **Drainage Analysis**

2.1.1 Summary

A subsurface infiltration system was permitted and installed through the redevelopment of Parcel D. This system receives runoff from both Parcel D roof drains and the Parcel D parking area. As described above, a portion of the proposed building included as part of this Project will be constructed above the Parcel D parking lot. The now existing catch basins previously installed as part of the Parcel D project will be disconnected from the subsurface infiltration system and routed to sanitary sewer to comply with Massachusetts State Plumbing Code. The existing subsurface infiltration system will be upsized to accommodate additional runoff volume from the Parcel E site. There is no change in curve number (parking lot vs. roof area) to Parcel D through this Project; therefore, this analysis documents Parcel E’s compliance with the City of Cambridge’s stormwater policy. Please see *Table 3: Peak Rates of Discharge Summary* below.

2.1.2 Stormwater Model Methodology

The proposed stormwater management design will provide a decrease in peak stormwater runoff rates from the proposed facility for the 2-, 10-, 25-, and 100-year design storm events utilizing the Soil Conservation Service (SCS) TR-20 and TR-55 Urban Hydrology for Small Watersheds methods. Specifically, the proposed stormwater management design results in “net decreases” in stormwater runoff rates directed toward the City of Cambridge stormwater system. The expanded subsurface infiltration system has been designed to reduce the 25-year post development peak runoff rate to match the 2-year pre-development peak to comply with the City of Cambridge stormwater policy for Parcel E. The portion of the subsurface infiltration system installed through the previously permitted Parcel D project will remain.

The assessment of existing and proposed stormwater flows was performed using HydroCAD® software. HydroCAD® input and output data is included in Appendices H and I. Lastly, as previously referenced, the proposed design includes the implementation of several BMPs designed to improve the quality of the post-development stormwater runoff.

Times of concentration (T_c) utilized in the preparation of this report were generated utilizing the SCS TR-55 Urban Hydrology for Small Watersheds method. Runoff coefficients for the pre- and post-

development conditions were calculated using widely accepted, and often utilized runoff coefficients and have been documented within the Appendices of this report.

Rainfall data for the storm events was obtained from the City of Cambridge 2070 Project Rainfall Totals (Appendix F). The following rainfall data was used in the calculations:

Table 1 – Rainfall Data

	2-Year	10-Year	25-Year	100-Year
Rainfall (inches)	3.65	6.40	8.22	11.70

2.1.3 Existing Hydrologic Model

The site is located within the Charles River watershed. Based on a review of The National Flood Hazard Insurance Rate Map, #25017C0577E effective 06/08/2022 (see Appendix D), the entire project area is located in Zone X and outside the 100-yr flood plain. Also included in Appendix D are the future flood elevations based on the Climate Change and Vulnerability Report provided by the City of Cambridge for 100-year storms in 2030 and 2070. Table 2 below shows the future flood elevations:

Table 2– Future Flood Elevation Data

	Parcel D	Parcel E
100-yr 2030 Elevation (Precip)	20.4	20.4
100-yr 2070 Elevation (Precip)	20.5	20.6
100-yr 2070 Elevation (SLR/SS)	23.5	23.5

The finished floor elevation of the proposed residential building will be set to approximately EL. 21.00, which is above the predicted future flood elevations for precipitation events.

Mapped soils underlying the site are classified as “urban land” based on the geotechnical report by McPhail Associates, LLC dated July 24, 2015 (see Appendix E). This means that the underlying soils are predominately fill used to construct the streets, parking lots and buildings, seen at the Site in the existing conditions.

The pre-development site has one subcatchment, EX-E1, as shown in Appendix G. Parcel E currently discharges directly to the City’s stormwater system via overland flow and piped roof drain connections from the Parcel’s existing building. All runoff from the Project is currently routed to the First Street storm drain main, which has been identified as the Project’s sole design point.

2.1.4 Proposed Hydrologic Model

The proposed stormwater collection and treatment system will meet the requirements of the City of Cambridge Wastewater and Stormwater Drainage Use Regulations. Stormwater runoff, which will be generated almost entirely from roof area, will be collected and routed to an expanded subsurface infiltration system located with the current Parcel D parking area. The system is designed so the post development peak rate for the 25-year storm will match the existing 2-year storm. Additionally, the stormwater management system will meet the City’s total suspended solids (TSS) and total phosphorous (TP) removal requirements by infiltrating runoff, as shown in the Appendix H.

The post-development site has one subcatchment, PR-E1, as shown in see Appendix H. As noted above, a subsurface infiltration system was installed as part of the construction of the new Parcel D building. This existing subsurface infiltration system will be upsized to accommodate new stormwater volumes and flows generated by Parcel E. The City’s storm drain main in First Street remains the Project’s sole design point.

Table 3 – Peak Rates of Discharge Summary

Storm Event*	Parcel E – Exist. Conditions (cfs)	Parcel E – Prop. Conditions (cfs)
2-Yr Event (3.65 in)	0.74	0.37
10-Yr Event (6.40 in)	1.30	0.61
25-Yr Event (8.22 in)	1.67	0.73
100-Yr Event (11.70 in)	2.38	1.88

*Rainfall per City of Cambridge “Rainfall Data Change based on 2070 Projected Event” table

As shown in the above table, the peak rate of discharge for the 25-yr storm in the proposed conditions is less than the 2-yr storm in the existing conditions.

As shown in Appendix H, the Project will remove 80% of TSS and 68% of TP on an average annual basis. This satisfies the City’s requirement of 80% removal of TSS and 65% removal of TP for redevelopment projects.

2.1.5 Conclusions

In summary, the proposed expansion of the existing subsurface infiltration system, as illustrated within the Site Development Plans prepared by Bohler (provided under separate cover), will result in a “net decrease” in the peak rate of runoff from the Site when compared to pre-development conditions for the 2-, 10-, 25-, and 100-year storm events. Additionally, the peak rate of runoff for the 25-year storm in the proposed conditions is less than the peak rate of runoff for the 2-year storm in the existing conditions. Furthermore, the best management practices implemented as part of the proposed stormwater management system design will result in a removal of TSS. As a result, the project meets and exceeds the requirements of the Massachusetts Department of Environmental Protection Stormwater Management Guidelines as required. The pre-development versus post-development peak discharge rates comparisons are contained within Tables 2 below, in cubic feet per second (cfs):

3.1 List of Permits

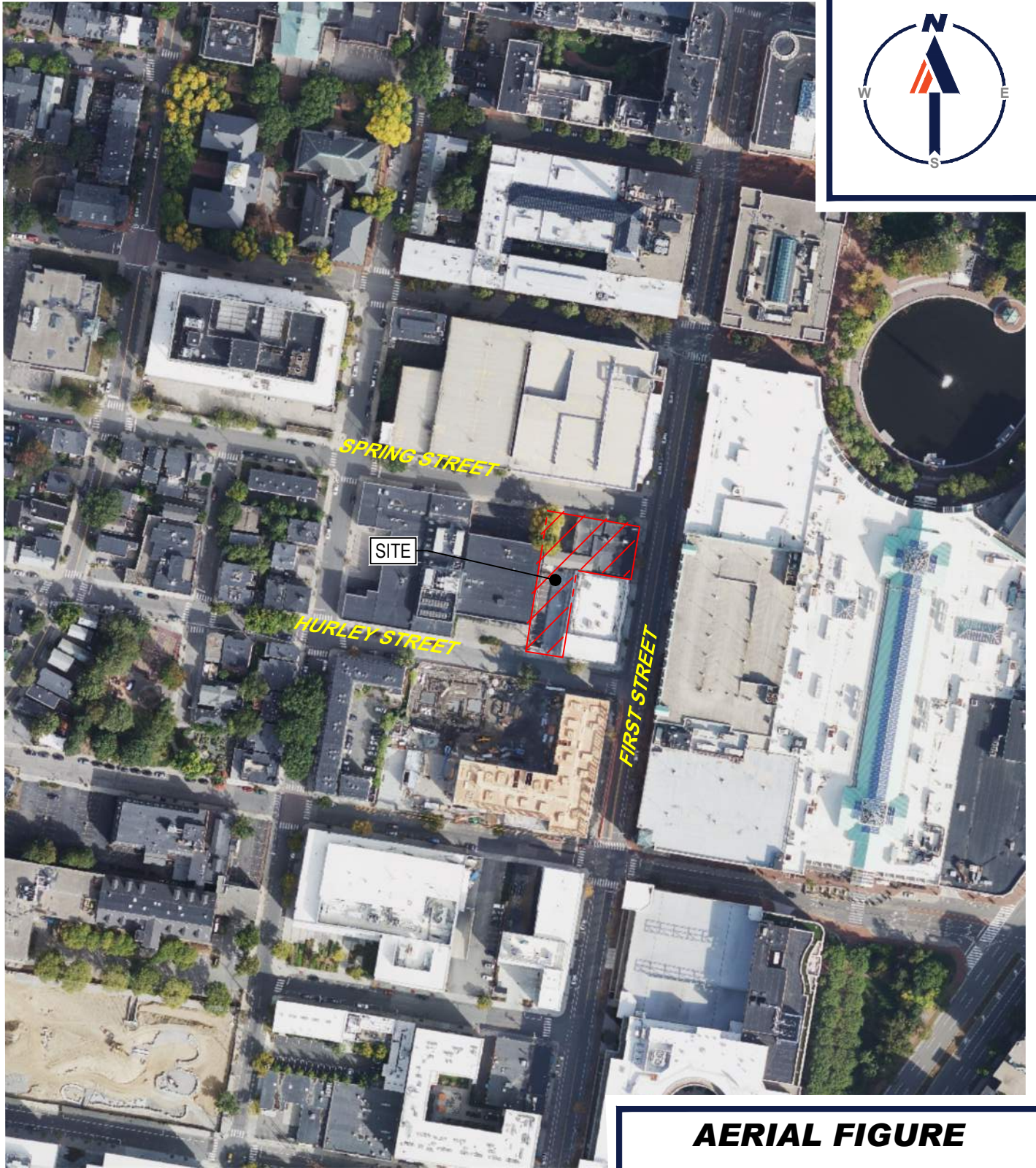
Permits for the project include the following:

- Project Review Special Permit
- Demolition Permit

4.1 Summary of Non-Applicable Items

The proposed project does not disturb more than 1 acre of land, therefore a NPDES permit is not applicable. The site is not in an Activity and Use Limitation (AUL) area therefore no information is provided. Additionally, the project site is not located in a flood plain zone or a wetland area therefore the site is not subject to a Flood Plain Special Permit or the Wetland Protection Act.

APPENDIX A
USGS LOCUS MAP



AERIAL FIGURE

75 & 85 FIRST STREET
CAMBRIDGE, MA

PREPARED BY

BOHLER //

SCALE: 1"=200' DATE: 07/12/2022

APPENDIX B
MASSDEP SITE HISTORY

Site Information			
Site Number:	3-0033481	Category:	120 DY
Site Name:	COMMERCIAL PROPERTY - 85-95 FIRST STREET	Release Type:	TIER 2
Address:	85-95 FIRST STREET	Current date:	3/21/2017
Town:	CAMBRIDGE	Phase:	PHASE II
Zipcode:	02141-0000	RAO Class:	
Official notification date:	3/21/2016	Locationtype:	
Initial status date:	3/21/2017	Source:	UNKNOWN

[Click Here for Supporting Documents](#)

Response Action Information	
Response Action Type:	TCLASS Tier Classification
Status:	TIERII Tier 2 Classification
Submittal Date:	03/21/2017
RAO class:	
Activity & Use Limitation:	
Response Action Type:	PHASEI Phase 1
Status:	CSRCVD Completion Statement Received
Submittal Date:	03/21/2017
RAO class:	
Activity & Use Limitation:	
Response Action Type:	PHASII Phase 2
Status:	SOW Scope of Work Received
Submittal Date:	03/21/2017
RAO class:	
Activity & Use Limitation:	
Response Action Type:	RNF Release Notification Form Received
Status:	REPORT Reportable Release or Threat of Release
Submittal Date:	03/21/2016
RAO class:	
Activity & Use Limitation:	
Response Action Type:	REL Potential Release or Threat of Release
Status:	REPORT Reportable Release or Threat of Release
Submittal Date:	03/21/2016
RAO class:	
Activity & Use Limitation:	

Chemicals		
Chemical	Amount	Units
2-METHYLNAPHTHALENE	5.34	MG/KG
ACENAPTHENE	8.35	MG/KG
ARSENIC	28	MG/KG
BENZO(A)ANTHRACENE	34	MG/KG
BENZO(A)PYRENE	32.1	MG/KG
BENZO(B)FLUORANTHENE	22.7	MG/KG
DIBENZ[A,H]ANTHRACENE	5.21	MG/KG
INDENO(1,2,3-CD)PYRENE	16.3	MG/KG
LEAD	1000	MG/KG
NAPHTHALENE	9.11	MG/KG
PHENANTHRENE	79.6	MG/KG

LSPs	
LSP#	Name
7155	FENNICK, THOMAS J



● Open Sites ● Closed Sites ● Closed Sites with Use Limitation

APPENDIX C
OWNER OF RECORD INFORMATION



Property Database

75 First St

Property Information

Property Class	RETAIL-STORE
State Class Code	325
Zoning (Unofficial)	PUD-4B-BA
Map/Lot	18-64
Land Area (sq. ft)	9,749

Property Value

Year of Assessment	2022
Tax District	C1
Residential Exemption	No
Building Value	
Land Value	\$3,290,400
Assessed Value	\$3,290,400
Sale Price	\$3,000,000
Book/Page	69367/562
Sale Date	June 1, 2017
Previous Assessed Value	\$2,784,200

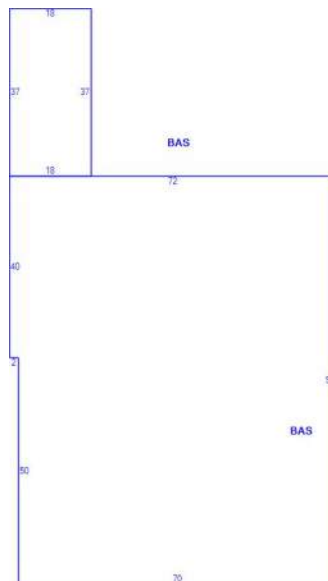
Owner Information

Owner(s)	US PARCEL E LLC 111 FIRST ST CAMBRIDGE, MA 02141
-----------------	--

Photos



Sketches



Building Information

*Commercial Building Number 1, Section 1***Exterior**

Style	RETAIL-STORE
Occupancy	RETAIL-STORE
Number of Stories	1
Exterior Wall Type	BRICK
Roof Material	TAR-GRAVEL
Wall Height	15
Partitions	AVERAGE

Interior

Living Area (sq. ft.)	7,046
Number of Units	2

Systems

Heat Type	FORCED-AIR
Heat Fuel	Gas
Plumbing	FAIR

Condition & Grade

Year Built	1940
Overall Condition	Average
Overall Grade	Fair

Subareas

Code	Description	Gross Area	Living Area
BAS	First Floor	7,046	7,046
	Total:	7,046	7,046

3 B



2017 00081684

Bk: 69367 Pg: 562 Doc: DEED
Page: 1 of 3 06/01/2017 09:41 AM

~~MASSACHUSETTS EXCISE TAX
Southern Middlesex District ROD # 001
Date: 06/01/2017 09:41 AM
Ctrl# 202699 12091 Doc# 00081684
Fee: \$13,680.00 Cons: \$3,000,000.00~~

Quitclaim Deed

Property Address: 75 First Street, Cambridge, Middlesex County, MA

LINDA SAXE, an unmarried individual with an address of 32 Timber Hill Drive, Monroe Township, New Jersey 08831 (“Grantor”), for consideration paid and in full consideration of Three Million and No/100 Dollars (\$3,000,000.00), paid to Grantor, the receipt and sufficiency of which are hereby acknowledged, does hereby GRANT WITH QUITCLAIM COVENANTS unto US PARCEL E, LLC, a Massachusetts limited liability company having an address of 111 First Street, Cambridge, Massachusetts 02141 (“Grantee”), that certain land located in the City of Cambridge, County of Middlesex, Commonwealth of Massachusetts known as 75 First Street, and being more particularly described in Exhibit A attached hereto and incorporated herein by reference, together with all improvements located on such land and all rights, and appurtenances benefiting such land and the improvements thereon.

Being the same premises conveyed to Grantor by deed of Linda Saxe and Richard Sobel, as Trustees of R&L Realty Trust under declaration of trust dated March 26, 1999, recorded with the Middlesex South District Registry of Deeds (the “Registry”) in Book 30271, Page 587, said deed dated May 13, 2005, and recorded with the Registry in Book 45347, Page 419.

Said premises are conveyed subject to and with the benefit of, as the case may be, all rights, restrictions, covenants, easements, and reservations of record, if any, all insofar as the same may be now in force and applicable, and further subject to real estate taxes assessed for the current fiscal year, but not yet due and payable, which Grantee, by acceptance hereof, hereby assumes and agrees to pay.

The Grantor certifies under the pains and penalties of perjury that I am unmarried and that I have no former spouse or former or current civil union partner who occupies or intends to occupy the premises as a principal residence or who is entitled to an estate of homestead in the premises, by court order or otherwise.

EXECUTED as an instrument under seal as of the 23rd day of May, 2017.

State of New Jersey)

County of Middlesex)

)
) ss.
)

Linda Saxe
LINDA SAXE
NJ DL Lic 509454736658465
Exp 10/31/2018

On this 23rd day of May, 2017, before me, the undersigned notary public, personally appeared Linda Saxe, proved to me through satisfactory evidence of identification, which was a valid driver's license, to be the person whose name is signed on the preceding or attached document, and acknowledged to me that she signed it voluntarily for its stated purpose, and who swore or affirmed to me that all statements made herein concerning marital status, occupancy and homestead are truthful accurate and complete.

Vinod Nishawan
VINOD NISHAWAN
Notary Public: NOTARY PUBLIC OF NEW JERSEY
My Commission Expires: 03/09/2021
VINOD NISHAWAN

Exhibit A

The land in Cambridge, Massachusetts, bounded and described as follows:

SOUTHEASTERLY	by First Street, seventy-five (75) feet;
NORTHEASTERLY	by Spring Street, one-hundred thirty (130) feet;
NORTHWESTERLY	by Lot B on plan hereinafter mentioned, seventy-five (75) feet; and
SOUTHWESTERLY	by land now or formerly of Richard A. Hemstreet, one-hundred thirty (130) feet.

Containing 9,750 square feet.

Being part of Lot A shown on a plan of land in Cambridge, made by M. Waters, C.E., dated August 8, 1941, recorded with said Deeds, in Book 6546, Page 207.

APPENDIX D
FEMA FIRMETTE AND CCVA ELEVATIONS



LEGEND:



SITE

SOURCE: FEDERAL EMERGENCY MANAGEMENT AGENCY

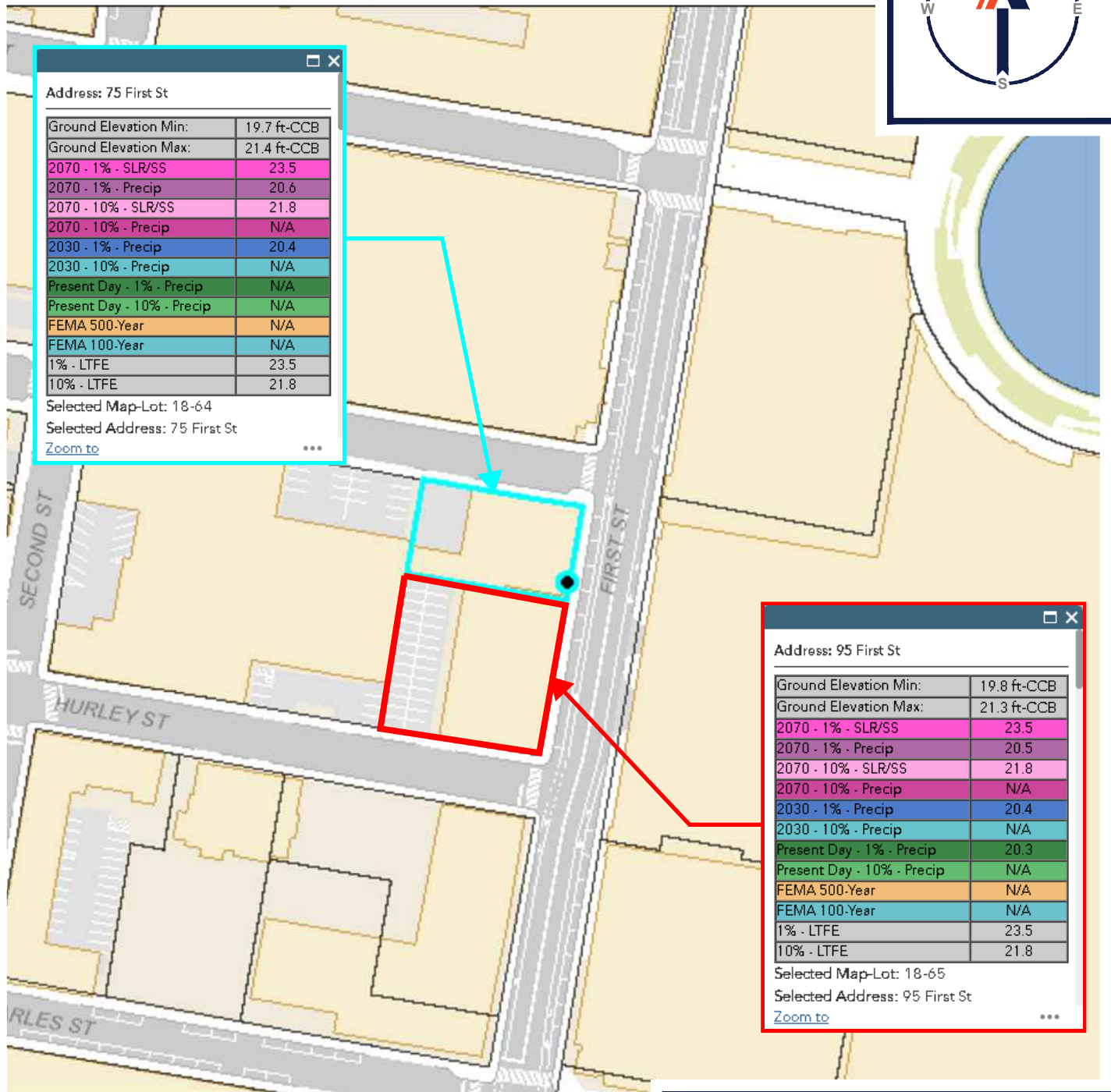
FIRMETTE EXHIBIT

75 & 85 FIRST STREET
CAMBRIDGE, MA

PREPARED BY

BOHLER //

SCALE: 1"=500' DATE: 07/12/2022



Address: 75 First St

Ground Elevation Min:	19.7 ft-CCB
Ground Elevation Max:	21.4 ft-CCB
2070 - 1% - SLR/SS	23.5
2070 - 1% - Precip	20.6
2070 - 10% - SLR/SS	21.8
2070 - 10% - Precip	N/A
2030 - 1% - Precip	20.4
2030 - 10% - Precip	N/A
Present Day - 1% - Precip	N/A
Present Day - 10% - Precip	N/A
FEMA 500-Year	N/A
FEMA 100-Year	N/A
1% - LTFE	23.5
10% - LTFE	21.8

Selected Map-Lot: 18-64
 Selected Address: 75 First St
[Zoom to](#)

Address: 95 First St

Ground Elevation Min:	19.8 ft-CCB
Ground Elevation Max:	21.3 ft-CCB
2070 - 1% - SLR/SS	23.5
2070 - 1% - Precip	20.5
2070 - 10% - SLR/SS	21.8
2070 - 10% - Precip	N/A
2030 - 1% - Precip	20.4
2030 - 10% - Precip	N/A
Present Day - 1% - Precip	20.3
Present Day - 10% - Precip	N/A
FEMA 500-Year	N/A
FEMA 100-Year	N/A
1% - LTFE	23.5
10% - LTFE	21.8

Selected Map-Lot: 18-65
 Selected Address: 95 First St
[Zoom to](#)

CAMBRIDGE FLOOD EXHIBIT

75 & 85 FIRST STREET
 CAMBRIDGE, MA

PREPARED BY

BOHLER //

SCALE: 1"=500' DATE: 07/12/2022

APPENDIX E
GEOTECHNICAL REPORT



FOUNDATION ENGINEERING REPORT

**FIRST STREET PLANNED UNIT
DEVELOPMENT – PARCEL D**

CAMBRIDGE, MASSACHUSETTS

DECEMBER 16, 2015

Prepared For:

Urban Spaces, LLC
111 First Street
Cambridge, MA 02141

2269 Massachusetts Avenue
Cambridge, MA 02140
www.mcphailgeo.com
(617) 868-1420

PROJECT NO. 5863



December 16, 2015

Urban Spaces, LLC
111 First Street
Cambridge, MA 02141

Attention: Mr. Jeffrey S. Hirsch

Reference: First Street Planned Unit Development – Parcel D; Cambridge, Massachusetts
Foundation Engineering Report

Ladies and Gentlemen:

This letter report documents the results of our subsurface exploration program, foundation design study, and soil characterization for the Parcel D building of the proposed First Street Planned Unit Development (PUD) to be located in Cambridge, Massachusetts. Refer to the Project Location Plan (Figure 1) for the general site location.

This report was prepared in accordance with our proposal dated October 30, 2015 and the subsequent authorization of Urban Spaces, LLC. These services are subject to the limitations contained in Appendix A.

Purpose and Scope

The purposes of the subsurface exploration program and foundation design study are to assess the subsurface soil and groundwater conditions at the site as they relate to foundation design and construction, and based on this information, to provide safe and economical foundation design recommendations for the proposed retail building.

Foundation design includes foundation support of the proposed building and its lowest level slab, treatment of the lowest level slab in consideration of groundwater, lateral earth pressures on foundation walls, and seismic design considerations in accordance with the provisions of the 8th Edition of the Massachusetts State Building Code (Code). Foundation construction considerations are also presented herein.

The purpose of our soil management plan is to address environmental considerations associated with either off-site re-use or disposal of existing site soils resulting from excavation for the proposed redevelopment of the site.

Available Information

Available information provided to McPhail Associates, LLC (McPhail) included:

- A 20-scale drawing entitled "ALTA/ASCM Land Survey" (Site Plan) dated July 3, 2014 and prepared by Hancock Associates.



- A schematic design set of drawings entitled, "85 First Street | First Street P.U.D." dated June 2015 and prepared by Perkins Eastman.
- A schematic design narrative entitled, "First Street P.U.D. – 85 First Street" dated June 17, 2015 and prepared by L.A. Fuess Partners.

Site Description

Fronting onto First Street to the east, the 16,250 square-foot site is bounded by Hurley Street to the south, a single-story retail building to the north, and a two-story office building to the west. An unoccupied, single-story, retail building with a footprint of about 6,400 square feet is located within the east portion of the site. It is understood that the building does not have a basement and the ground floor slab is at about Elevation +21. A paved parking lot is located to the west of the existing building. The existing ground surface in the parking lot is relatively level ranging from about Elevation +20 to Elevation +21.

Elevations as referenced herein are in feet and refer to the City of Cambridge datum, which is 10.84 feet below the National Geodetic Vertical Datum of 1929 (NGVD).

Proposed Site Development

It is understood that the proposed construction will consist of demolition of the existing building, followed by construction of a single-story retail building that will extend over and beyond the footprint of the existing building. The proposed building is planned to have a footprint of about 7,900 square feet. It is understood that the proposed building will not have a basement and the ground floor slab will be approximately coincident with the adjacent exterior grades at about Elevation +21.

The following loading information was provided to us by L.A. Fuess Partners, the Project Structural Engineer:

- Assuming soil-supported slab: Maximum column load = 90 kips compression and 25 kips tension.
- Assuming structurally-supported slab: Maximum column load = 177 kips compression and 25 kips tension. Intermediate support between columns = 125 kips compression. Supplemental slab support = 88 kips compression.

Subsurface Exploration Program

On November 11 and 13, 2015, six (6) borings were performed at the site as part of our geotechnical and geoenvironmental studies. The borings were conducted by Technical Drilling Services, Inc. (TDS) of Sterling, Massachusetts under contract to McPhail. The approximate exploration locations are indicated on the enclosed Subsurface Exploration Plan (Figure 2).



The borings were performed within or immediately adjacent to the footprint of the proposed building to assess the subsurface soil and groundwater conditions at the site as they relate to foundation design and construction. Four of the borings (B-204 through B-207) were performed utilizing truck-mounted drilling equipment and were advanced using hollow-stem augers or wet rotary drilling methods. Standard 2-inch O.D. split-spoon samples and standard penetration tests (SPT) were typically obtained at minimum 5-foot intervals of depth in accordance with the standard procedures in ASTM D1586. Two of the borings (GP-1 and GP-2) were advanced with a portable, geoprobe rig using the direct push method. Soil samples were obtained continuously using 2-inch O.D. expandable plastic liners.

Groundwater observation wells were installed in completed boreholes B-204, B-205, B-207 and GP-1. Boring logs prepared by Carr-Dee are presented in Appendix B following the text of this report. Groundwater monitoring reports prepared by McPhail are presented in Appendix C.

The explorations were monitored by a McPhail representative who performed field layout, prepared field logs, obtained and visually classified soil samples, monitored groundwater conditions in the completed boreholes and groundwater observation wells, made minor relocations of the explorations, and determined the required exploration depths based upon the actual subsurface conditions encountered.

Field locations of the explorations were determined by taping from existing site features indicated on the above referenced Site Plan. The existing ground surface elevation at each boring location was determined by a level survey performed by our field staff utilizing vertical control information on the Site Plan.

At the completion of the field work, soil samples were returned to our laboratory for more detailed classification, analysis and testing. The laboratory testing consisted of sieve analyses to determine the gradations and confirm the visual classifications of the fill and marine sand deposits. Laboratory test procedures were in general accordance with applicable ASTM Standards. Results of the sieve analyses appear on Figures 3 and 4 following the text of this report.

Subsurface Conditions

Detailed descriptions of the subsurface conditions encountered at the borings are presented on the boring logs contained in Appendix B. The approximate boring locations are indicated on the enclosed Figure 2. The generalized subsurface conditions across the site were inferred from the borings, as well as our general knowledge of the local geology. The subsurface conditions encountered in the borings are described below.

At each boring, a deposit of historic fill (i.e. "urban fill") was encountered that extended to depths ranging from about 8 to 13 feet below the existing ground surface. In general, the historic fill deposit was observed to consist of a very loose to loose, dark brown to black, soil containing variable percentages of sand, gravel, and silt, and containing brick, wood,



concrete, ash and cinders. Grain-size distributions of typical samples of the fill deposit are provided in Figure 3.

Underlying the historic fill deposit, a 5.5 to 14-foot thick deposit of natural organic soil was encountered in the borings. The organic deposit generally consists of a very soft to firm, gray organic silt with peat fibers and trace shells.

Underlying the natural organic soil, a deposit of marine sand was encountered, which was observed to consist of a compact, gray sand with trace to some gravel and trace silt, varying to a sand and gravel with trace silt. Where penetrated at borings B-206 and B-207, the thickness of the marine sand was observed to be 9.5 feet and 8.5 feet, respectively. The surface of the marine sand was generally encountered at depths ranging from about 15 to 19 feet below the existing ground surface or from Elevation -1.1 to Elevation +2.4. Grain-size distributions of typical samples of the marine sand deposits are provided in Figure 4.

Upon penetrating the fill, organic, and marine sand deposits, the explorations encountered a deposit of soft to stiff, yellow to blue-gray, silty marine clay, known locally as Boston Blue Clay. The surface of the marine clay was encountered at depths of about 28 feet and 30 feet below the existing ground surface at borings B-206 and B-207, respectively, corresponding to Elevation -7.1 and Elevation -8.9. The marine clay was not penetrated in the borings; however, based on our knowledge of the local geology, the marine clay is anticipated to be underlain by a deposit of glacial till directly over the bedrock surface.

Groundwater was observed within the completed boreholes at depths ranging from about 6.6 to 13 feet below the existing ground surface or from Elevation +14.6 to Elevation +7.6. Stabilized groundwater levels observed in the groundwater observation wells installed at the site ranged from 7.7 to 11.0 feet below the existing ground surface or from Elevation +13.3 to Elevation +10.8. Based on the data from the groundwater observation wells, the groundwater generally flows from northwest to southeast across the site.

It is anticipated that future groundwater levels across the site may vary from those reported herein due to factors such as normal seasonal changes, periods of heavy precipitation, and alterations of existing drainage patterns. Groundwater monitoring reports documenting levels observed within the groundwater observation wells at the site are included in Appendix C.

Results of Chemical Testing

Following our recent subsurface investigation program, representative samples of the fill deposit were submitted for chemical analyses for off-site disposal. Selection of the specific tests to be performed was oriented towards satisfying typical disposal facility criteria within the Commonwealth of Massachusetts.



Two (2) composite soil samples of the fill deposit consisting of several discrete samples from the borings were submitted for chemical analyses for the presence of total petroleum hydrocarbons (TPH), semivolatile organics (SVOC), total RCRA-8 metals, PCBs, pH, reactive sulfide, reactive cyanide, conductivity and ignitability. One (1) discrete sample each, from within the anticipated depth of excavation (0-6 feet), at borings B-206 and B-207 that indicated the highest reading for TVOC during field screening was selected for analysis for VOCs.

A total of sixty (60) samples collected during the borings and were screened utilizing a MiniRAE 3000 photoionization detector (PID) for the presence of total volatile organic compounds (TVOC). The headspace screening results are summarized in Table 1. The results of headspace screening indicated the presence of TVOC ranging from 0.0 to 111.1 parts per million (ppm). None of the samples obtained indicated the presence of any visual or olfactory evidence of petroleum contamination.

No reactive cyanide or reactive sulfide was detected in the submitted samples of the fill deposit. Thus, the fill deposit is not considered hazardous as a result of reactivity. Specific Conductance ranged from 100 micro-ohms per centimeter (umhos/cm) to 120 umhos/cm. Levels of pH ranged from 8.0 Standard Units (S.U.) up to 8.3 S.U. None of the samples tested were reported to be ignitable.

The results indicated that cadmium, selenium and silver were not detected in concentrations above their respective laboratory method detection limits. The results indicated the presence of barium, chromium and mercury in concentrations ranging from 55 mg/kg to 200 mg/kg, 9.3 mg/kg to 26 mg/kg, and 1.03 mg/kg to 1.59 mg/kg, respectively. The concentrations are below the applicable Reportable Concentrations in soil as defined in the MCP, 310 CMR 40.0000 and below published Background levels in natural soil.

The submitted composite samples from boring B-206 and B-207 indicated the presence of lead at concentrations of 310 mg/kg and 1,000 mg/kg, respectively, which exceed the RCS-1 soil standard for mercury of 200 mg/kg. Accordingly, these exceedances represent a 120-day reporting condition pursuant to the provisions of the Massachusetts Contingency Plan (MCP) and require notification to the DEP. Recommendations for response actions required under the MCP, if any, will be addressed in our Phase II Environmental Site Assessment.

Sample "B-207 0-6 FILL" indicated the presence of arsenic at a concentration of 28 mg/kg, which exceeds the RCS-1 soil standard for arsenic of 20 mg/kg. Accordingly, this exceedance represents a 120-day reporting condition pursuant to the provisions of the Massachusetts Contingency Plan (MCP) and requires notification to the DEP. Recommendations for response actions required under the MCP, if any, will be addressed in our Phase II Environmental Site Assessment.

The submitted composite samples from borings B-206 and B-207 that exhibited total lead concentrations greater than 100 mg/kg were analyzed for the presence of TCLP (leachable) lead. The results indicate the presence of TCLP lead at concentrations ranging from below the method detection limit to 1.5 mg/l.



In consideration of off-site disposal of soils, material that exhibits a TCLP lead level greater than 5 mg/l is considered a characteristic hazardous waste for off-site disposal. Thus, the fill is not considered a characteristic hazardous waste for off-site disposal as confirmed by TCLP lead analysis.

The submitted composite samples from borings B-206 and B-207 indicate concentrations of individual SVOC compounds ranging from below the method detection limits up to 12 mg/kg, with several concentrations exceeding the applicable RCS-1 standard. Accordingly, these exceedances represent a 120-day reporting condition pursuant to the provisions of the Massachusetts Contingency Plan (MCP) and require notification to the DEP. Recommendations for response actions required under the MCP, if any, will be addressed in our Phase II Environmental Site Assessment.

The results indicate the presence of VOCs and PCBs at concentrations below the laboratory method detection limits and below the individual RCS-1 standards. The results indicate the presence of TPH in concentrations ranging from 400 mg/kg to 938 mg/kg, which are below the RCS-1 standard for TPH of 1,000 mg/kg.

Recommendations regarding the off-site disposal of the on-site fill deposit based on the chemical test results are presented in the "Foundation Construction Considerations" section of this report. A summary of the chemical test results for the fill deposit is provided on Table 2 and the complete laboratory data is contained in Appendix D. The boring/sample locations are shown on the attached Figure 2.

Foundation Design Recommendations

Based on the scope of the proposed development and the results of the subsurface exploration program, the project site is underlain by an uncontrolled fill material and an organic silt deposit, which are unsuitable for support of the proposed building. Within the footprint of the proposed building, the combined thickness of the existing fill and organic deposits were observed to extend to depths ranging from about 18.5 to 22 feet below the existing ground surface. The use of timber friction piles and pressure-injected footings (PIFs) were considered for foundation support of the proposed building. However, due to the moderate structural loads and due to the need for a structural slab for pile-supported buildings, these options were not considered to be the most economical solution. Accordingly, it is recommended the proposed building be founded on conventional spread footing foundations in conjunction with a soil-supported slab-on-grade after the existing unsuitable soils beneath the footings and the slab-on-grade of the proposed building are improved using aggregate piers (APs). Based on information provided by the Project Structural Engineer, the footings can be designed to account for the uplift forces without the use of anchors.

In general, the AP cavity is created by driving a specially designed 12 to 16-inch diameter mandrel and tamper foot using a large static force augmented by dynamic vertical impact energy. A sacrificial cap or other method is used to prevent soil from entering the mandrel



during driving. This method of advancement eliminates spoils as all penetrated soils are displaced laterally.

After driving to the design depth, which would extend into the marine sand deposit, the aggregate is placed inside the mandrel and the mandrel is raised leaving a lift of aggregate in the cavity. Typically, the tamper foot is raised approximately four feet and then driven and vibrated back down three feet, forming a one-foot thick, compacted lift. This process is repeated to the top of the cavity, forming the AP. The compaction densifies the aggregate and increases the lateral stress in the soil matrix beneath the proposed building. Thus, the potential for large settlements is reduced by improving the unsuitable soils to a stiffer composite soil matrix.

Since ground improvement techniques such as APs are provided by a design-build consultant, detailed design calculations should be submitted to the Architect for review prior to the beginning of construction. A detailed explanation of the design parameters for capacity and settlement calculations should be included in the design submittal. The design submittal should also include a testing program to demonstrate the capacity of the AP elements. All calculations and drawings should be prepared and sealed by a Professional Engineer licensed in the Commonwealth of Massachusetts, and retained by the Contractor who is to perform the work.

APs should be designed such that the reinforced soil matrix is capable of supporting a minimum allowable bearing pressure of 5,000 pounds per square-foot. The maximum design bearing pressure should be verified by the AP contractor using a modulus test. Additionally, the AP-improved soils shall limit long-term total settlement of footings to less than 1-inch and limit long-term differential settlement of adjacent footings to less than 1/2-inch.

All foundations should be designed in accordance with the 8th Edition of the Massachusetts State Building Code (Code). Recommended minimum footing widths for continuous and isolated spread footings are 30 and 36 inches, respectively. Perimeter foundations and foundations below unheated areas should be provided with a minimum 4-foot thickness of soil cover as frost protection. Interior foundations in heated areas should be located such that the top of the foundation concrete is a minimum of 6 inches below the underside of the lowest level slab. All foundations should be located such that they are below a theoretical line drawn upward and outward at 2 horizontal to 1 vertical from the bottom exterior edge of all adjacent footings, structures and utilities.

It is recommended that the lowest level slab of the structure be designed as a conventional slab-on-grade underlain by a polyethylene vapor barrier placed directly over a minimum 6-inch thickness of compacted gravel fill.

It is understood that the proposed building will not have any below-grade space and that the lowest level slab will be approximately coincident with the adjacent exterior grades. Therefore, the lowest level slab need not be provided with perimeter or underslab drainage; however, exterior finished grades should be pitched away from the perimeter walls to



minimize surface water infiltration. All localized depressions in the lowest level slab extending below grade (such as pits, etc.) should be provided with properly tied continuous waterstops in all construction joints and metallic waterproofing to protect against groundwater intrusion.

Lateral forces can be considered to be transmitted from the structure to the soil by passive pressure against the foundation walls utilizing an equivalent fluid density of 120 pounds per cubic foot providing that the walls are designed to resist these pressures. Lateral force can also be considered to be transmitted from the structure to the soil by friction on the base of footings using a coefficient of 0.40, to which a safety factor of 1.5 should be applied.

Seismic Design Considerations

For the purposes of determining parameters for structural seismic design, this site is considered to be a Site Class D as defined in Section 1613.0 of the Code. Further, the bearing strata on the proposed site are not considered to be subject to liquefaction during an earthquake based on the criterion of Section 1806.4 of the Code.

Foundation Construction Considerations

The primary foundation construction considerations include, pre-excavation, removal of site utilities and structures, preconstruction survey, preparation of foundation bearing surfaces, construction dewatering, settlement monitoring, reuse of on-site soils, and off-site disposal of excess excavated soil.

The proposed retail building will overlap the footprint of the existing building. Following the building demolition at the site, it is recommended that all existing foundations, pile caps, grade beams, slabs, utilities and other below-grade structures within the footprint of the proposed building be removed in their entirety. The resulting excavations should be backfilled with compacted structural fill.

The type of foundation used to support the existing building is unknown. However, it is likely that the building is supported on a pile foundation. Where the remains of former piles are encountered within the footprint of the proposed building, they should be cut-off at least 2 feet below the bottom of the proposed footing or slab subgrade. Where former piles are encountered at proposed AP locations, the AP should be relocated around the piles at the direction of the AP Designer.

It is not anticipated that ground vibrations caused by AP installation will cause damage to nearby structures. However, due to the proximity of the adjacent buildings to the proposed construction, it is recommended that the Owner or Contractor perform a preconstruction survey of the adjacent buildings before the start of earthwork construction and that vibration monitoring be performed during AP installation.



All excavations in the AP reinforced fill deposit should be performed utilizing a smooth-edged or "toothless" excavator bucket to avoid disturbance of the composite bearing surface. Immediately following excavation to the final footing subgrade, a minimum 3-inch thickness of compacted 3/4-inch crushed stone should be placed over the footing subgrade to protect the bearing surface from subsequent disturbance.

As groundwater was not observed in the borings within the anticipated depth of excavation, it is not anticipated that significant groundwater control will be required during the construction period. We anticipate that dewatering by means of conventional sumping should suffice for groundwater control during periods of high precipitation. It is recommended that all pumped groundwater be discharged on-site. If pumped groundwater cannot be discharged on-site, it would be necessary to dispose of pumped groundwater into a nearby storm drain or combined sewer which would require the need for a groundwater discharge permit.

Due to the moderate to high silt content of the fill deposit, proper control of groundwater and surface water will be necessary to maintain a firm subgrade to support construction traffic. Even with proper control of both surface water and groundwater, it is probable that during periods of wet weather gravel fill and/or crushed stone may be required to maintain trafficability for construction equipment.

The excavated fill deposit is expected to be suitable for reuse as ordinary fill, provided that it is maintained in a relatively dry condition and can be properly compacted. The explorations indicate the presence of construction debris existing fill deposit. Thus, prior to reusing the existing fill it will be necessary to cull out all material in excess of 4 inches in largest dimension.

As discussed previously, the existing fill deposit has a high silt content. Hence, it is emphasized that the fill deposit can become unsuitable for on-site reuse if it becomes too wet. It is recommended that stockpiles of excavated material intended for reuse be protected against increases in moisture content by securely covering the stockpiles prior to and during precipitation events. The placement and compaction of the on-site fill should be completed during relatively dry and non-freezing conditions.

Chemical testing was performed to pre-characterize up to approximately 1,000 cubic yards of the on-site fill deposit for off-site disposal. Based on the results of the chemical testing, excess on-site fill material that is generated from within the footprint of the proposed building meets the requirements for off-site disposal at a Massachusetts unlined landfill.

Since evidence of a reportable release of lead, arsenic, and SVOCs was observed at the site, off-site reuse and/or disposal of the excavated fill materials resulting from construction of the proposed building will require implementation of the Bill of Lading process to track the disposition of the excavated material. Off-site disposal of excess generated soil should be conducted in accordance with the current policies of the Department of Environmental Protection.



It is recommended that construction be performed under a site-specific health and safety plan to minimize possible exposure to total metals (arsenic and lead) and SVOCs present in the existing fill material. The site-specific health and safety plan as well as general construction considerations should be employed to protect the general public and workers from exposure to the excavated soils. All temporarily stockpiled fill materials should be stored on and covered by 6-mil polyethylene sheeting. Measures to minimize airborne dust should also be employed during earthwork operations, such as the use of water during dry periods. Soils that might be tracked onto the streets by trucks and construction equipment should be removed from these vehicles before they leave the construction site.

Concrete walls, concrete slabs and wood piles associated with the former site structures as well as subsurface utilities are likely to be encountered during site excavation. These materials are not considered to be classified as contaminated material and may be recycled or disposed off-site as solid waste pursuant to applicable DEP policy.

Final Comments

McPhail Associates, LLC has been retained to provide design assistance to the design team during the final design phase of this project. The purpose of this involvement would be to review the structural foundation drawings and foundation notes for conformance with the recommendations presented herein and to generate the aggregate pier and earthwork specifications for inclusion into the Contract Documents for construction.

It is recommended that McPhail Associates, LLC be retained during the construction period to review earthwork-related submittals, prepare paperwork for off-site disposal of contaminated soils, observe final preparation of the foundation bearing surfaces, and to monitor placement and compaction of fill materials in accordance with the provisions of the Code and the provisions of the Contract Documents. Our involvement during the construction phase of the work should minimize costly delays due to unanticipated field problems since our field engineer would be under the direct supervision of our project manager who was responsible for the subsurface investigation and foundation and site design recommendations documented herein.



Urban Spaces, LLC
December 16, 2015
Page 11

We trust that the above is sufficient for your present requirements. Should you have any questions concerning the recommendations presented herein, please do not hesitate to call us.

Very truly yours,

McPHAIL ASSOCIATES, LLC

A handwritten signature in blue ink, appearing to read "Scott S. Smith".

Scott S. Smith, P.E.

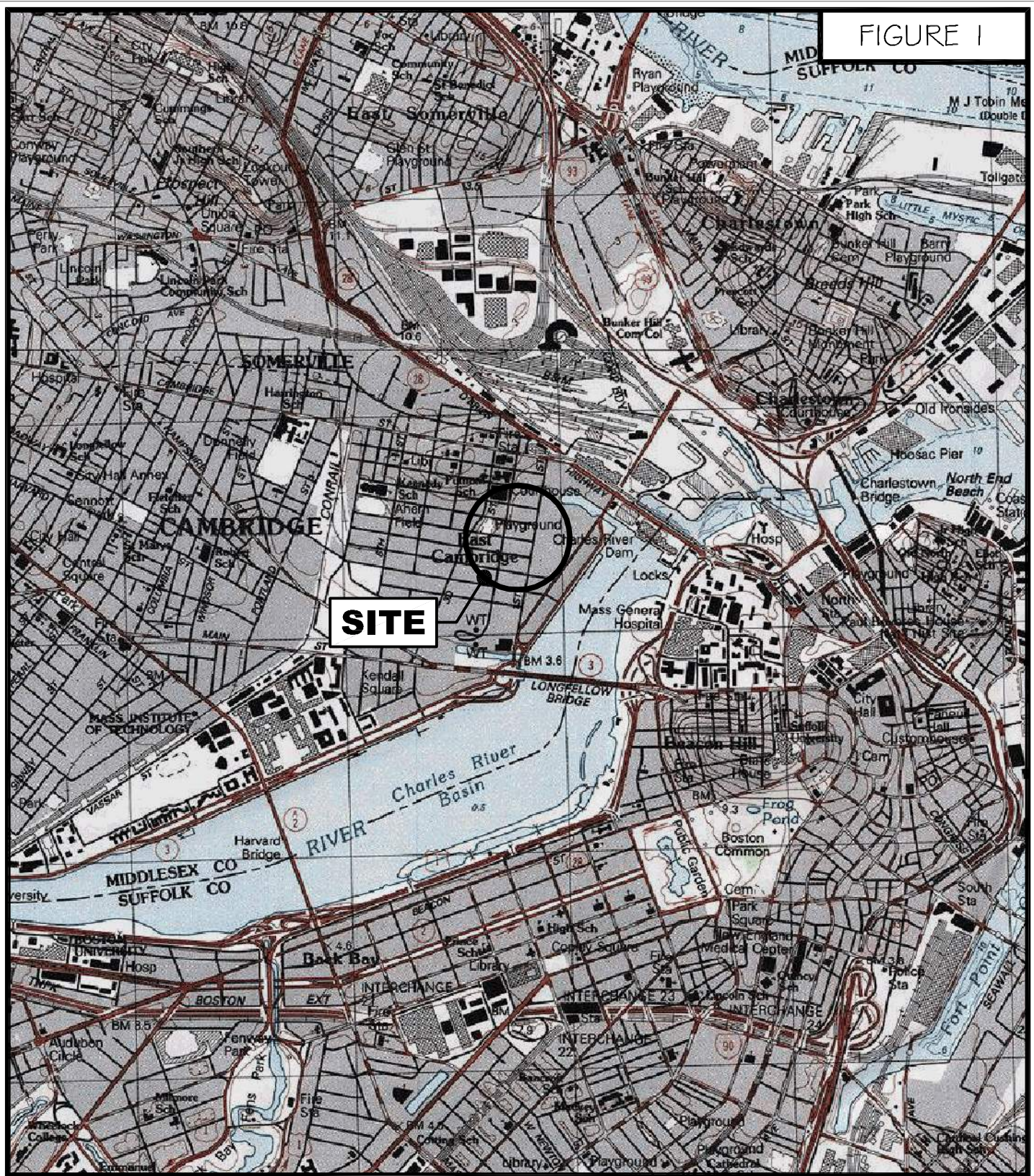
A handwritten signature in blue ink, appearing to read "Thomas J. Fennick".

Thomas J. Fennick, P.E., L.S.P.

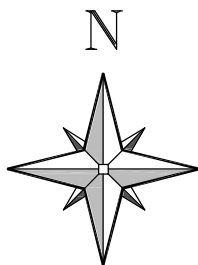
F:\WP5\REPORTS\5863 Geotech-Parcel D_121615.docx

SSS/tjf

FIGURE I



Geotechnical and
 Geoenvironmental Engineers
 2269 Massachusetts Avenue
 Cambridge, MA 02140
 617/868-1420
 617/868-1423 (Fax)
 www.mcphailgeo.com



SCALE 1:25,000

PROJECT LOCATION PLAN

FIRST STREET P.U.D.

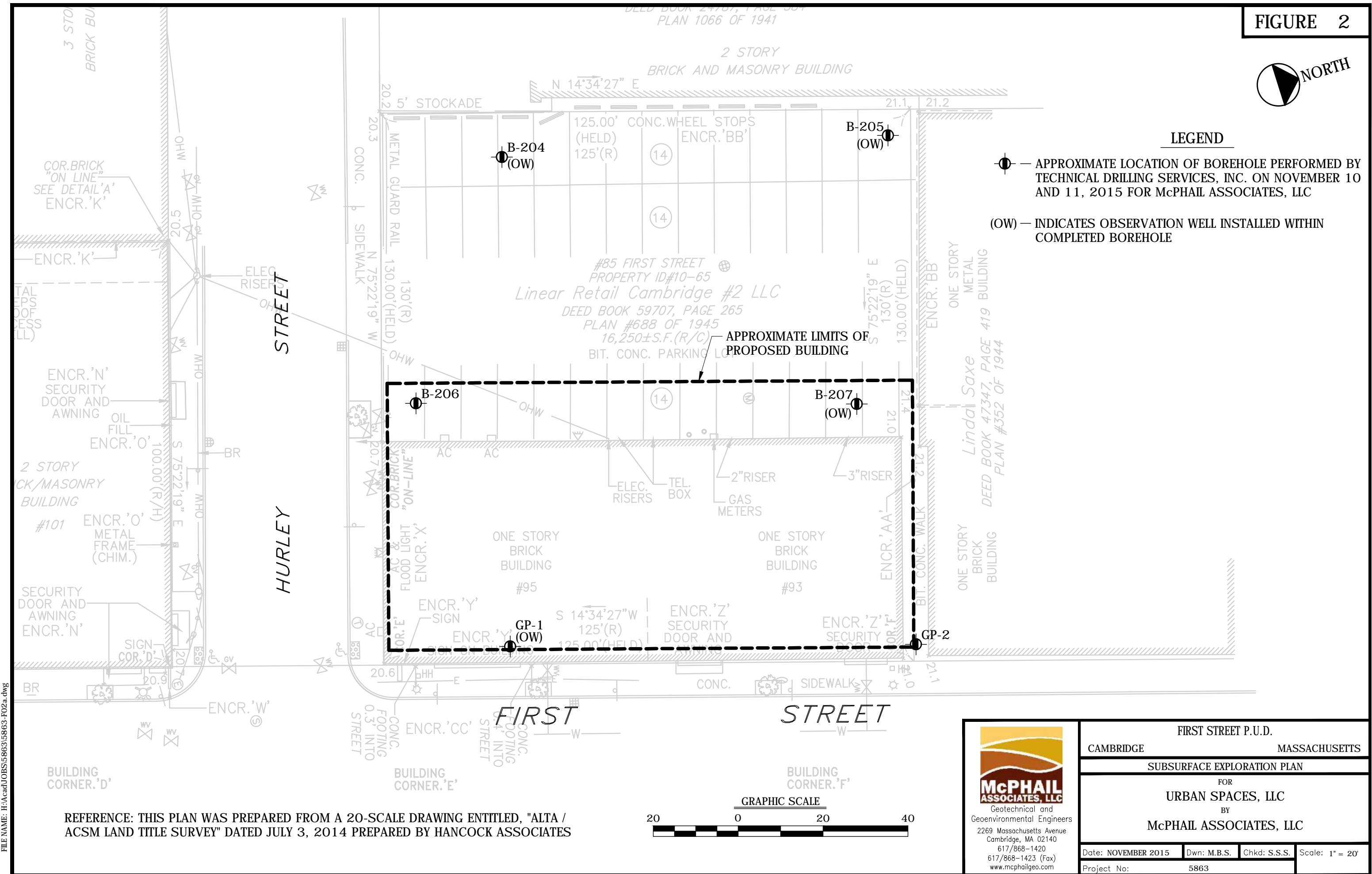
CAMBRIDGE

MASSACHUSETTS

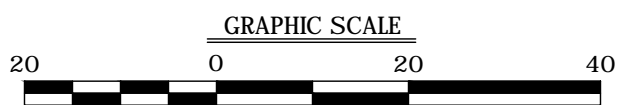


LEGEND

- APPROXIMATE LOCATION OF BOREHOLE PERFORMED BY TECHNICAL DRILLING SERVICES, INC. ON NOVEMBER 10 AND 11, 2015 FOR McPHAIL ASSOCIATES, LLC
- (OW) — INDICATES OBSERVATION WELL INSTALLED WITHIN COMPLETED BOREHOLE



REFERENCE: THIS PLAN WAS PREPARED FROM A 20-SCALE DRAWING ENTITLED, "ALTA / ACSM LAND TITLE SURVEY" DATED JULY 3, 2014 PREPARED BY HANCOCK ASSOCIATES

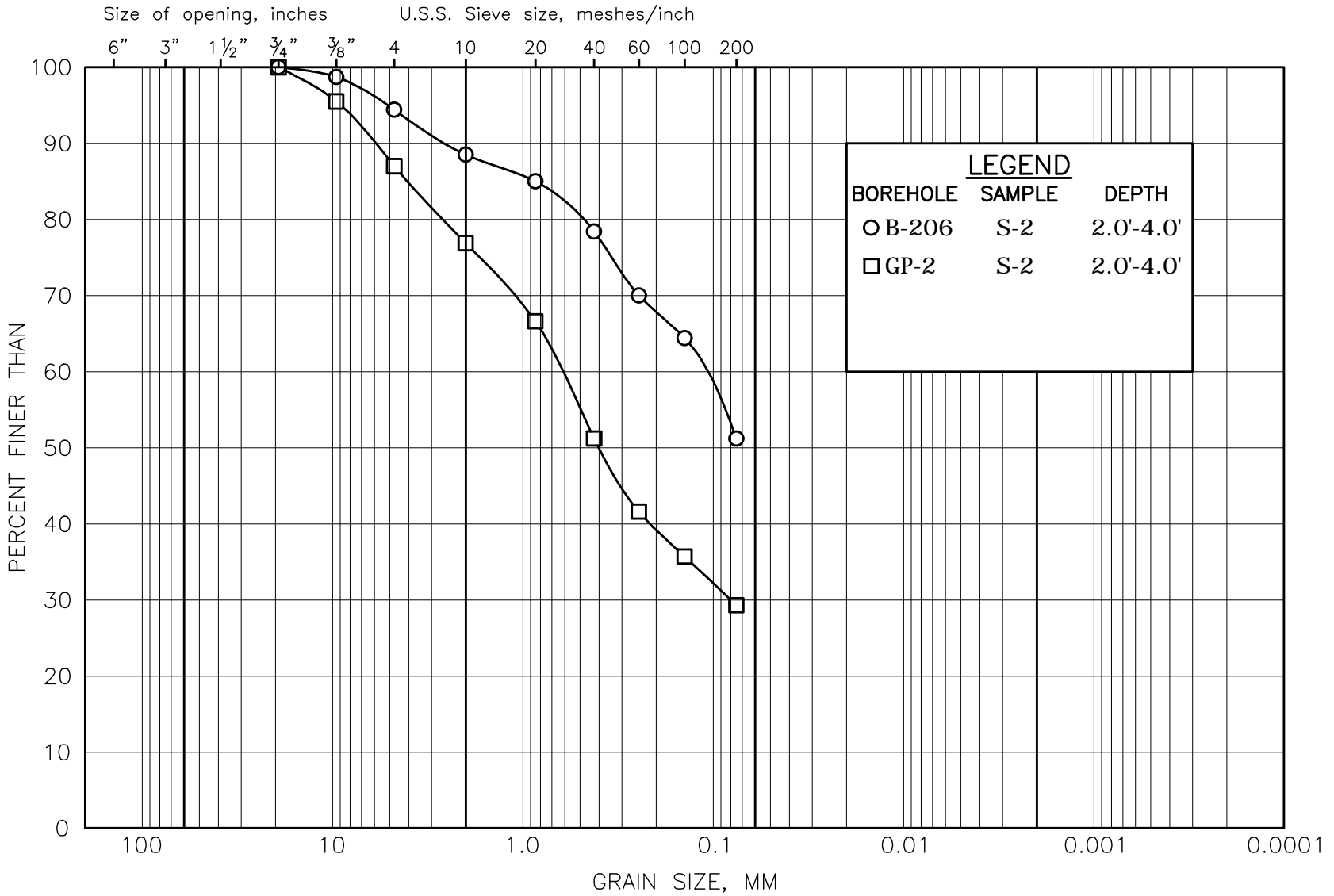


McPHAIL ASSOCIATES, LLC
Geotechnical and Geoenvironmental Engineers
2269 Massachusetts Avenue
Cambridge, MA 02140
617/868-1420
617/868-1423 (Fax)
www.mcphailgeo.com

FIRST STREET P.U.D.			
CAMBRIDGE		MASSACHUSETTS	
SUBSURFACE EXPLORATION PLAN			
FOR			
URBAN SPACES, LLC			
BY			
McPHAIL ASSOCIATES, LLC			
Date: NOVEMBER 2015	Dwn: M.B.S.	Chkd: S.S.S.	Scale: 1" = 20'
Project No: 5863			

FILE NAME: H:\Acad\JOBS\5863\F02a.dwg

M.I.T. GRAIN SIZE SCALE



LEGEND		
BOREHOLE	SAMPLE	DEPTH
○ B-206	S-2	2.0'-4.0'
□ GP-2	S-2	2.0'-4.0'

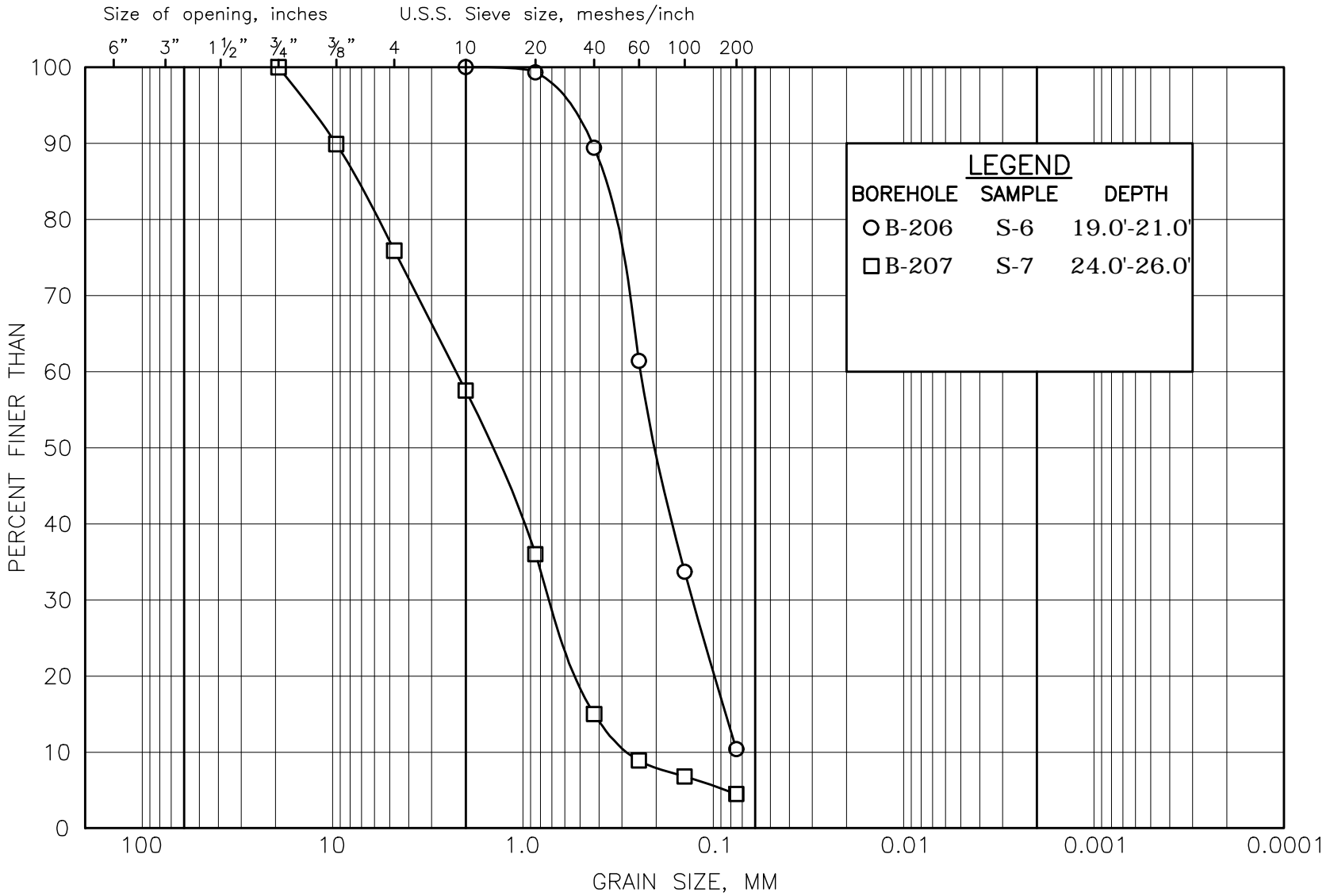
COBBLE SIZE	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	SILT SIZE	CLAY SIZE
	GRAVEL SIZE			SAND SIZE				

McPHAIL ASSOCIATES, LLC

GRAIN SIZE DISTRIBUTION
FILL

FIGURE 3

M.I.T. GRAIN SIZE SCALE



LEGEND		
BOREHOLE	SAMPLE	DEPTH
○ B-206	S-6	19.0'-21.0'
□ B-207	S-7	24.0'-26.0'

COBBLE SIZE	COARSE	MEDIUM	FINE	COARSE	MEDIUM	FINE	SILT SIZE	CLAY SIZE
	GRAVEL SIZE			SAND SIZE				

McPHAIL ASSOCIATES, LLC

GRAIN SIZE DISTRIBUTION
MARINE SAND

FIGURE 4

TABLE 1
First Street PUD - Parcel D
Project No: 5863
Headspace Readings in Sample Jars

EXPLORATION NO.	SAMPLE NO.	SAMPLE DEPTH (FT)	SAMPLE TYPE	PID READING (ppm)	VISUAL/OLFACTORY EVIDENCE OF CONTAMINATION
<i>BACKGROUND</i>				0.0	
B-204	S-1	0.5-2	Fill	0.9	Ash, cinder, brick
	S-2	2-4	Fill	0.8	Ash, cinder, brick
	S-3	4-6	Fill	0.2	Ash, cinder, brick
	S-4	6-8	Fill	0.2	None
	S-5	8-10	Fill	0.2	Ash, cinder, wood
	S-6	10-12	Fill	0.4	Ash, cinder
	S-7	12-14	Organic	0.6	None
	S-8	14-16	Organic	0.4	None
B-205	S-1	0.5-2	Fill	0.7	Ash, cinder, concrete
	S-2	2-4	Fill	0.4	Ash, cinder
	S-3	4-6	Fill	0.6	Ash, cinder
	S-4	6-8	Fill	0.3	Ash, cinder
	S-5	8-10	Organic	0.3	None
	S-6	10-12	Organic	0.4	None
	S-7	12-14	Organic	0.3	None
	S-8	14-16	Organic	4.0	None
B-206	S-1	0.5-2	Fill	0.6	Ash, cinder, brick
	S-2	2-4	Fill	0.2	Brick, concrete, wood
	S-3	4-6	Fill	0.2	Ash, cinder
	S-4	10-12	Fill	1.2	Ash, cinder
	S-5	14-16	Organic	69.9	None
	S-6	19-21	Sand	22.3	None
	S-7	24-26	Sand	0.6	None
	S-8	29-31	Clay	0.1	None
	S-9	34-36	Clay	0.1	None
B-207	S-1	0.5-2	Fill	0.8	Ash, cinder
	S-2	2-4	Fill	1.8	Ash, cinder
	S-3	4-6	Fill	0.3	Ash, cinder
	S-4	10-12	Organic	0.4	None
	S-5	15-17	Organic	0.3	None
	S-6	19-21	Organic	111.1	None
	S-7	24-26	Sand	1.2	None
	S-8	29-30	S	0.2	None
	S-8A	30-21	Clay	0.2	None
S-9	34-36	Clay	1.3	None	
GP-1	S-1	0-2	Fill	0.1	Ash, cinder
	S-2	2-4	Fill	0.3	Ash, cinder, concrete
	S-3	4-6	Fill	0.4	Ash, cinder, concrete, brick, wood
	S-4	6-8	Fill	0.6	Ash, cinder, concrete, brick, wood
	S-5	8-10	Fill	0.5	Ash, cinder, concrete, brick, wood
	S-6	10-11.5	Fill	0.1	Ash, cinder, concrete

TABLE 1
First Street PUD - Parcel D
Project No: 5863
Headspace Readings in Sample Jars

EXPLORATION NO.	SAMPLE NO.	SAMPLE DEPTH (FT)	SAMPLE TYPE	PID READING (ppm)	VISUAL/OLFACTORY EVIDENCE OF CONTAMINATION
	S-7	11.5-12	Organic	0.7	None
	S-8	12-14	Organic	0.4	None
	S-9	14-16	Organic	0.1	None
	S-10	16-18	Organic	26.3	None
	S-11	18-20	Organic	47.4	None
	S-12	20-22	Sand	36.3	None
	S-13	22-24	Sand	25.6	None
GP-2	S-1	0-2	Fill	0.0	Ash, cinder, brick
	S-2	2-4	Fill	0.0	Ash, cinder, concrete
	S-3	4-6	Fill	0.2	Ash, cinder
	S-4	6-8	Fill	0.1	Ash, cinder
	S-5	8-10	Organic	0.4	None
	S-6	10-12	Organic	0.1	None
	S-7	12-14	Organic	0.2	None
	S-8	14-16	Organic	0.3	None
	S-9	16-18	Organic	0.2	None
	S-10	18-20	Organic	2.3	None
	S-11	20-22	Organic	0.3	None
	S-12	22-24	Sand	0.1	None

TABLE 2

CHEMICAL TEST RESULTS - SOIL MANAGEMENT
FIRST STREET PUD - PARCEL D
PROJECT NO. 5863

LOCATION SAMPLING DATE	RCS-1	DEP BACKGROUND ("Natural"/Fill Material with Ash) 5/23/02	Unlined Landfill	Units	B-206 0-6 FILL 11/13/2015 L1529845-03/ L1531278 Fill 0-6'	B-206 S1 0-2 11/13/2015 L1529845-02 Fill 0-2'	B-207 0-6 FILL 11/11/2015 L1529480-06/ L1529948-02 Fill 0-6'	B-207 0-6 FILL 11/11/2015 L1529480-06 R1 Fill 0-6'	B-207 S2 2-4 11/11/2015 L1529480-07 Fill 2-4'	B-207 S2 2-4 11/11/2015 L1529845-01 Fill 2-4'
General Chemistry - Westborough Lab										
Specific Conductance			4000	umhos/cm	120		100			
Solids, Total				%	88.6	88.6	83.7		83.7	83.5
pH (H)				SU	8.3		8			
Cyanide, Reactive	30			mg/kg	ND(10)		ND(10)			
Sulfide, Reactive				mg/kg	ND(10)		ND(10)			
Ignitability					NI		NI			
MCP Polychlorinated Biphenyls - Westborough Lab										
Total PCB	1			mg/kg	ND(0.0356)		ND(0.038)			
MCP Semivolatile Organics - Westborough Lab										
Acenaphthene	4	0.5/2		mg/kg	0.68		2.2			
Fluoranthene	1000	4/10		mg/kg	7.1		12	13		
Naphthalene	4	0.5/1		mg/kg	ND(0.36)		1.6			
Benzo(a)anthracene	7	2/9		mg/kg	3.3		6.8			
Benzo(a)pyrene	2	2/7		mg/kg	3.1		6			
Benzo(b)fluoranthene	7	2/8		mg/kg	4		7.6			
Benzo(k)fluoranthene	70	1/4		mg/kg	1.3		2.5			
Chrysene	70	2/7		mg/kg	3.5		6.2			
Acenaphthylene	1	0.5/1		mg/kg	0.44		0.41			
Anthracene	1000	1/4		mg/kg	1.5		5			
Benzo(ghi)perylene	1000	1/3		mg/kg	1.8		3.3			
Fluorene	1000	1/2		mg/kg	0.63		2.4			
Phenanthrene	10	3/20		mg/kg	6.1		12	13		
Dibenzo(a,h)anthracene	0.7	0.5/1		mg/kg	0.47		0.87			
Indeno(1,2,3-cd)Pyrene	7	1/3		mg/kg	2		4			
Pyrene	1000	4/20		mg/kg	6.4		11	11		
Dibenzofuran	100			mg/kg	0.38		1.8			
2-Methylnaphthalene	0.7	0.5/1		mg/kg	ND(0.44)		0.9			
Total SVOC			100	mg/kg	42.7		86.58	37		
MCP Total Metals - Westborough Lab										
Arsenic, Total	20	20/20	40	mg/kg	5.8		28			
Barium, Total	1000	50/50		mg/kg	55		200			
Cadmium, Total	70	2/3	30	mg/kg	ND(0.45)		ND(0.46)			
Chromium, Total	100	30/40	1000	mg/kg	9.3		26			
Lead, Total	200	100/600	1000	mg/kg	310		1000			
Mercury, Total	20	0.3/1	10	mg/kg	1.03		1.59			
Selenium, Total	400	0.5/1		mg/kg	ND(2.2)		ND(2.3)			
Silver, Total	100	0.6/5		mg/kg	ND(0.45)		ND(0.46)			
TCLP Metals by EPA 1311 - Westborough Lab										
Lead, TCLP					1.5		ND(0.5)			
Mercury, TCLP										

ND - denotes none detected
() - Detection Limit
Blank - not analyzed

TABLE 2

CHEMICAL TEST RESULTS - SOIL MANAGEMENT
FIRST STREET PUD - PARCEL D
PROJECT NO. 5863

LOCATION SAMPLING DATE	RCS-1	DEP BACKGROUND ("Natural"/Fill Material with Ash) 5/23/02	Unlined Landfill	Units	B-206 0-6 FILL 11/13/2015 L1529845-03/ L1531278 Fill 0-6'	B-206 S1 0-2 11/13/2015 L1529845-02 Fill 0-2'	B-207 0-6 FILL 11/11/2015 L1529480-06/ L1529948-02 Fill 0-6'	B-207 0-6 FILL 11/11/2015 L1529480-06 R1 Fill 0-6'	B-207 S2 2-4 11/11/2015 L1529480-07 Fill 2-4'	B-207 S2 2-4 11/11/2015 L1529845-01 Fill 2-4'
MCP Volatile Organics by 8260/5035 - Westborough Lab										
Total VOC			4	mg/kg		ND			ND	
Petroleum Hydrocarbon Quantitation - Westborough Lab										
TPH	1000		2500	mg/kg	938		400			
Volatile Petroleum Hydrocarbons - Westborough Lab										
C9-C10 Aromatics	100			mg/kg						ND(3.28)
C5-C8 Aliphatics, Adjusted	100			mg/kg						ND(3.28)
C9-C12 Aliphatics, Adjusted	1000			mg/kg						ND(3.28)
Extractable Petroleum Hydrocarbons - Westborough Lab										
C9-C18 Aliphatics	1000			mg/kg						ND(7.5)
C19-C36 Aliphatics	3000			mg/kg						8.31
C11-C22 Aromatics, Adjusted	1000			mg/kg						19.4
Phenanthrene	10	3/20		mg/kg						1.56
Anthracene	1000	1/4		mg/kg						0.386
Fluoranthene	1000	4/10		mg/kg						2.04
Pyrene	1000	4/20		mg/kg						2.04
Benzo(a)anthracene	7	2/9		mg/kg						0.964
Chrysene	70	2/7		mg/kg						1.09
Benzo(b)fluoranthene	7	2/8		mg/kg						0.735
Benzo(k)fluoranthene	70	1/4		mg/kg						0.804
Benzo(a)pyrene	2	2/7		mg/kg						1.03
Indeno(1,2,3-cd)Pyrene	7	1/3		mg/kg						0.562
Benzo(ghi)perylene	1000	1/3		mg/kg						0.574
Disposal Option					Unlined Landfill			Unlined Landfill		

ND - denotes none detected
() - Detection Limit
Blank - not analyzed



**APPENDIX A:
LIMITATIONS**



LIMITATIONS

This report has been prepared on behalf of and for the exclusive use of Urban Spaces, LLC for specific application to Parcel D of the proposed First Street Planned Urban Development to be located at 85 First Street in Cambridge, Massachusetts in accordance with generally accepted soil and geotechnical engineering practices. No other warranty, expressed or implied, is made.

In the event that any changes in nature or design of the proposed construction are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by McPhail Associates.

The analyses and recommendations presented in this report are based upon the data obtained from the subsurface explorations performed at the approximate locations indicated on the enclosed plan. If variations in the nature and extent of subsurface conditions between the widely spaced explorations become evident during the course of construction, it will be necessary for a re-evaluation of the recommendations of this report to be made after performing on-site observations during the construction period and noting the characteristics of any variations.



APPENDIX B:

**MCPHAIL ASSOCIATES, LLC'S
BORING LOGS B-204 THROUGH B-207, GP-1 AND GP-2**

Project: First Street P.U.D. **Job #:** 5863 **Boring No.:** B-204(OW)
Location: First St., Charles St., Hurley St. **Date Started:** 11-11-15
City/State: Cambridge, MA **Date Finished:** 11-11-15

Contractor: Technical Drilling Services, Inc. **Casing Type/Depth (ft):** HSA
Driller/Helper: D. Newton/A. Nactis **Casing Hammer (lbs)/Drop (in):** N/A
Logged By/Reviewed By: T. Cormican **Sampler Size/Type:** 24" Split Spoon
Surface Elevation (ft): 20.6 **Sampler Hammer (lbs)/Drop (in):** 140 lbs./30"

Groundwater Observations			
Date	Depth	Elev.	Notes
11-11-15	13.0	7.6	

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample						Sample Description and Boring Notes
					TVOC (ppm)	N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft	
	20		0.4 / 20.2	PAVEMENT							
1	19			FILL	0.9	20	S-1	18/6	0.5-2.0	6 10 10	Compact black SILT and SAND with ash and cinders (FILL).
2	18				0.8	16	S-2	24/10	2.0-4.0	10 9 7 7	Compact black SILT and SAND with ash, cinders, and brick (FILL).
3	17				0.2	6	S-3	24/12	4.0-6.0	4 3 3 4	Compact black SILT and SAND with ash, cinders, and brick (FILL).
4	16				0.2	12	S-4	24/16	6.0-8.0	4 5 7 10	Compact mottled yellow and orange SILT and black SILT and SAND (FILL).
5	15				0.2	9	S-5	24/10	8.0-10.0	5 5 4 3	Loose black SILT and SAND (FILL).
6	14				0.4	6	S-6	24/16	10.0-12.0	4 3 3 1	Loose black SILT and SAND (FILL).
7	13				0.6	4	S-7	24/18	12.0-14.0	2 2 2 2	Soft to firm gray ORGANIC SILT (ORGANICS).
8	12				0.4	2	S-8	24/24	14.0-16.0	1 1 1 2	Very soft to soft gray ORGANIC SILT (ORGANICS).
9	11		12.0 / 8.6								
10	10										
11	9										
12	8										
13	7										
14	6										
15	5		16.0 / 4.6								
16	4										
17	3										
18	2										
19	1										
20	0										
21	-1										
22	-2										

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
 2-inch diameter observation well installed at 13 feet.
 Weather:



McPHAIL ASSOCIATES, LLC
 2269 MASSACHUSETTS AVENUE
 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

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Project: First Street P.U.D.	Job #: 5863	Boring No.:
Location: First St., Charles St., Hurley St.	Date Started: 11-11-15	B-205(OW)
City/State: Cambridge, MA	Date Finished: 11-11-15	

Contractor: Technical Drilling Services, Inc.	Casing Type/Depth (ft): HSA	Groundwater Observations	
Driller/Helper: D. Newton/A. Nactis	Casing Hammer (lbs)/Drop (in): N/A	Date	Depth
Logged By/Reviewed By: T. Cormican	Sampler Size/Type: 24" Split Spoon	Elev.	Notes
Surface Elevation (ft): 21.0	Sampler Hammer (lbs)/Drop (in): 140 lbs./30"		

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample						Sample Description and Boring Notes				
					TVOC (ppm)	N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft					
1	20		0.5 / 20.5	PAVEMENT											
2	19			FILL	0.7	10	S-1	18/6	0.5-2.0	3 3 7	Loose to compact black SILT and SAND with brick (FILL).				
3	18				0.4	7	S-2	24/12	2.0-4.0	6 4 3 3	Loose gray-black silty SAND, trace ash and cinders (FILL).				
4	17				0.6	6	S-3	24/10	4.0-6.0	4 4 2 4	Loose gray silty CLAY, black organic SILT and SAND (FILL).				
5	16				0.3	15	S-4	24/12	6.0-8.0	5 8 7 3	Compact sandy CLAY (FILL).				
6	15					8.0 / 13.0	ORGANICS	0.3	2	S-5	24/20	8.0-10.0	1 1 1 1	Very soft to soft gray-brown to gray ORGANIC SILT, trace sand (ORGANICS).	
7	14							0.4	7	S-6	24/20	10.0-12.0	3 4 3 6	Firm gray ORGANIC SILT with frequent sand partings (ORGANICS).	
8	13							0.3	2	S-7	24/20	12.0-14.0	1 1 1 1	Very soft to soft gray ORGANIC SILT with frequent sand partings (ORGANICS).	
9	12							4	3	S-8	24/20	14.0-16.0	1 1 2 3	Soft gray ORGANIC SILT with frequent sand partings (ORGANICS).	
10	11		16.0 / 5.0												
11	10														
12	9														
13	8														
14	7														
15	6														
16	5														
17	4														
18	3														
19	2														
20	1														
21	0														
22	-1														

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS		Notes:
BLOWS/FT.	CONSISTENCY	
<2	V.SOFT	2-inch diameter observation well installed at 15.1 feet.
2-4	SOFT	
4-8	FIRM	
8-15	STIFF	
15-30	V.STIFF	
>30	HARD	

Weather:



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Project: First Street P.U.D.	Job #: 5863	Boring No.
Location: First St., Charles St., Hurley St.	Date Started: 11-13-15	B-206
City/State: Cambridge, MA	Date Finished: 11-13-15	

Contractor: Technical Drilling Services, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: D. Newton/A. Nactis	Casing Hammer (lbs)/Drop (in): 300 lbs./24"	Date	Depth
Logged By/Reviewed By: T. Cormican	Sampler Size/Type: 24" Split Spoon	11-13-15	9
Surface Elevation (ft): 20.9	Sampler Hammer (lbs)/Drop (in): 140 lbs./30"	Elev.	Notes
		11.9	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample						Sample Description and Boring Notes		
					TVOC (ppm)	N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft			
			0.3 / 20.6 0.8 / 20.1	PAVEMENT CONCRETE									
1	20	[Symbol: Diagonal Hatching]		FILL	0.6	8	S-1	18/8	0.5-2.0	6 4 4	Loose black SILT and SAND with ash, cinders, and brick (FILL).		
2	19												
3	18						0.2	12	S-2	24/10	2.0-4.0	4 5 7 10	Compact dark gray-brown SILT and SAND, some gravel with brick, concrete, and wood (FILL).
4	17												
5	16						0.2	22	S-3	24/16	4.0-6.0	8 15 7 7	Compact mottled yellow and orange SILT and SAND with ash and cinders (FILL).
6	15												
7	14												
8	13												
9	12												
10	11												
11	10						1.2	4	S-4	24/6	10.0-12.0	4 3 1 1	Loose black silty SAND (FILL).
12	9												
13	8		13.0 / 7.9										
14	7	[Symbol: Vertical Lines]		ORGANICS									
15	6					69.9	4	S-5	24/18	14.0-16.0	4 3 1 1	Soft to firm gray ORGANIC SILT to dark brown fibrous PEAT (ORGANICS).	
16	5												
17	4												
18	3		18.5 / 2.4										
19	2	[Symbol: Stippled]		MARINE SAND									
20	1					22.3	19	S-6	24/14	19.0-21.0	8 9 10 10	Compact gray-brown fine to medium SAND, trace silt (MARINE SAND).	
21	0												
22	-1												

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:

Weather:



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 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
 FAX: 617-868-1423

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Project: First Street P.U.D.	Job #: 5863	Boring No.:
Location: First St., Charles St., Hurley St.	Date Started: 11-13-15	B-206
City/State: Cambridge, MA	Date Finished: 11-13-15	

Contractor: Technical Drilling Services, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: D. Newton/A. Nactis	Casing Hammer (lbs)/Drop (in): 300 lbs./24"	Date	Depth
Logged By/Reviewed By: T. Cormican	Sampler Size/Type: 24" Split Spoon	11-13-15	9
Surface Elevation (ft): 20.9	Sampler Hammer (lbs)/Drop (in): 140 lbs./30"	Elev.	Notes
		11.9	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample						Sample Description and Boring Notes
					TVOC (ppm)	N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft	
24	-3	[Symbol]	28.0 / -7.1	MARINE SAND							Compact gray-brown SAND, some gravel, trace silt (MARINE SAND).
25	-4				0.6	19	S-7	24/6	24.0-26.0	8 10 9 11	
26	-5										
27	-6	[Symbol]	36.0 / -15.1	MARINE CLAY							Firm gray silty CLAY (MARINE CLAY).
28	-7										
29	-8										
30	-9				0.1	7	S-8	24/20	29.0-31.0	3 3 4 6	
31	-10										
32	-11										
33	-12										
34	-13										
35	-14										
36	-15										
37	-16										
38	-17										
39	-18										
40	-19										
41	-20										
42	-21										
43	-22										
44	-23										
45	-24										

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:

Weather:



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 CAMBRIDGE, MA 02140
 TEL: 617-868-1420
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Project: First Street P.U.D. **Job #:** 5863 **Boring No.:** B-207(OW)
Location: First St., Charles St., Hurley St. **Date Started:** 11-11-15
City/State: Cambridge, MA **Date Finished:** 11-13-15

Contractor: Technical Drilling Services, Inc. **Casing Type/Depth (ft):** HW
Driller/Helper: D. Newton/A. Nactis **Casing Hammer (lbs)/Drop (in):** 300 lbs./24"
Logged By/Reviewed By: T. Cormican **Sampler Size/Type:** 24" Split Spoon
Surface Elevation (ft): 21.1 **Sampler Hammer (lbs)/Drop (in):** 140 lbs./30"

Groundwater Observations			
Date	Depth	Elev.	Notes
11-13-15	6.5	14.6	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample						Sample Description and Boring Notes			
					TVOC (ppm)	N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft				
			0.5 / 20.6	PAVEMENT										
1	20	[Cross-hatched symbol]	0.5 / 20.6	FILL	0.8	21	S-1	18/12	0.5-2.0	3 6 15	Compact dark grey-brown SILT and SAND with ash and cinders (FILL).			
2	19											Compact black SILT and SAND (FILL).		
3	18							1.8	15	S-2	24/2	2.0-4.0	10 7 8 7	
4	17													
5	16							0.3	9	S-3	24/10	4.0-6.0	3 5 4 6	Loose black SILT and SAND and yellow-orange SILT (FILL).
6	15													
7	14													
8	13													
9	12													
10	11					10.0 / 11.1	ORGANICS							
11	10			0.4	2	S-4		24/18	10.0-12.0	1 1 1 1	Very soft to soft gray ORGANIC SILT with frequent fine sand partings (ORGANICS).			
12	9													
13	8													
14	7													
15	6													
16	5			0.3	2	S-5		24/24	15.0-17.0	1 1 1 1	Very soft to soft gray ORGANIC SILT (ORGANICS).			
17	4													
18	3													
19	2													
20	1				111.1	7	S-6	24/18	19.0-21.0	4 3 4 3	Fine dark brown FIBROUS PEAT (ORGANICS).			
21	0		21.5 / -0.4	MARINE SAND										
22	-1													

GRANULAR SOILS	
BLOWS/FT.	DENSITY
0-4	V.LOOSE
4-10	LOOSE
10-30	COMPACT
30-50	DENSE
>50	V.DENSE

SOIL COMPONENT	
DESCRIPTIVE TERM	PROPORTION OF TOTAL
"TRACE"	0-10%
"SOME"	10-20%
"ADJECTIVE" (eg SANDY, SILTY)	20-35%
"AND"	35-50%

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS	
BLOWS/FT.	CONSISTENCY
<2	V.SOFT
2-4	SOFT
4-8	FIRM
8-15	STIFF
15-30	V.STIFF
>30	HARD

Notes:
 2-inch diameter observation well installed at 15.3 feet.
 Weather:



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 FAX: 617-868-1423

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Project: First Street P.U.D.	Job #: 5863	Boring No.
Location: First St., Charles St., Hurley St.	Date Started: 11-11-15	B-207(OW)
City/State: Cambridge, MA	Date Finished: 11-13-15	

Contractor: Technical Drilling Services, Inc.	Casing Type/Depth (ft): HW	Groundwater Observations	
Driller/Helper: D. Newton/A. Nactis	Casing Hammer (lbs)/Drop (in): 300 lbs./24"	Date	Depth
Logged By/Reviewed By: T. Cormican	Sampler Size/Type: 24" Split Spoon	11-13-15	6.5
Surface Elevation (ft): 21.1	Sampler Hammer (lbs)/Drop (in): 140 lbs./30"	Elev.	Notes
		14.6	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample						Sample Description and Boring Notes
					TVOC (ppm)	N-Value RQD	No.	Pen./Rec. (in)	Depth (ft)	Blows/6" Min/ft	
24	-3		30.0 / -8.9	MARINE SAND							Compact gray-brown SAND, some gravel, trace silt (MARINE SAND).
25	-4				1.2	25	S-7	24/16	24.0-26.0	16 10 15 18	
26	-5		30.0 / -8.9	MARINE SAND							Compact gray SAND, some gravel, trace silt (MARINE SAND).
27	-6				0.5	18	S-8	12/10	29.0-30.0	10 8	
28	-7		36.0 / -14.9	MARINE CLAY							Firm to stiff gray silty CLAY (MARINE CLAY).
29	-8				0.2	9	S-8A	12/12	30.0-31.0	5 4	
30	-9		36.0 / -14.9	MARINE CLAY							Firm gray silty CLAY (MARINE CLAY).
31	-10				1.3	6	S-9	24/24	34.0-36.0	3 3 3 3	
32	-11		36.0 / -14.9	MARINE CLAY							
33	-12										
34	-13		36.0 / -14.9	MARINE CLAY							
35	-14										
36	-15		36.0 / -14.9	MARINE CLAY							
37	-16										
38	-17		36.0 / -14.9	MARINE CLAY							
39	-18										
40	-19		36.0 / -14.9	MARINE CLAY							
41	-20										
42	-21		36.0 / -14.9	MARINE CLAY							
43	-22										
44	-23		36.0 / -14.9	MARINE CLAY							
45	-24										

GRANULAR SOILS		SOIL COMPONENT	
BLOWS/FT.	DENSITY	DESCRIPTIVE TERM	PROPORTION OF TOTAL
0-4	V.LOOSE	"TRACE"	0-10%
4-10	LOOSE	"SOME"	10-20%
10-30	COMPACT	"ADJECTIVE" (eg SANDY, SILTY)	20-35%
30-50	DENSE	"AND"	35-50%
>50	V.DENSE		

SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"

COHESIVE SOILS		Notes:
BLOWS/FT.	CONSISTENCY	
<2	V.SOFT	2-inch diameter observation well installed at 15.3 feet.
2-4	SOFT	
4-8	FIRM	
8-15	STIFF	
15-30	V.STIFF	
>30	HARD	

Weather:



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Project: First Street P.U.D.	Job #: 5863	Geoprobe No.
Location: First St., Charles St., Hurley St.	Date Started: 11-11-15	GP-1(OW)
City/State: Cambridge, MA	Date Finished: 11-11-15	

Contractor: Technical Drilling Services, Inc.	Casing Type/Depth (ft): 2-1/8" O.D. Drive Tube	Groundwater Observations	
Driller/Helper: T. Newton	Casing Hammer (lbs)/Drop (in): N/A	Date	Depth
Logged By/Reviewed By: M. Sachs	Sampler Size/Type: 1-1/16" Plastic Sheath	11-11-15	10.5
Surface Elevation (ft): 21.3	Sampler Hammer (lbs)/Drop (in): N/A	Elev.	Notes
		10.8	

Depth (ft)	Elev. (ft)	Symbol	Depth/EL to Strata Change (ft)	Stratum	Sample				Sample Description and Notes
					TVOC (ppm)	No.	Pen./Rec. (in)	Depth (ft)	
1	21	[Cross-hatch symbol]	11.5 / 9.8	FILL	0.1	S-1	24/5	0.0-2.0	Brown SAND, SILT, and GRAVEL with ash and cinders (FILL).
2	20				0.3	S-2	24/5	2.0-4.0	Brown SAND, SILT, and GRAVEL with ash, cinders, and concrete (FILL).
3	19				0.4	S-3	24/12	4.0-6.0	Brown-gray SAND and SILT, trace clay with gravel, with ash, cinders, brick, wood, and concrete (FILL).
4	18				0.6	S-4	24/14	6.0-8.0	Brown-black SAND, silt, trace clay, with gravel, ash, cinders, brick, wood, and concrete (FILL).
5	17				0.5	S-5	24/24	8.0-10.0	Brown-black SAND, silt, trace clay with gravel, ash, cinders, brick, wood, and concrete (FILL).
6	16				0.1	S-6	18/16	10.0-11.5	Gray silty SAND, with gravel, trace clay, ash, cinders, and concrete (FILL).
7	15				0.7	S-7	6/6	11.5-12.0	Black silty ORGANICS, trace shells, trace gravel (ORGANICS).
8	14				0.4	S-8	24/20	12.0-14.0	Black silty ORGANICS, trace shells, trace gravel (ORGANICS).
9	13				0.1	S-9	24/24	14.0-16.0	Black silty ORGANICS, trace shells, trace gravel (ORGANICS).
10	12				26.3	S-10	24/12	16.0-18.0	Black silty ORGANICS and peat (ORGANICS).
11	11				47.4	S-11	24/12	18.0-20.0	Black, silty ORGANICS and sand (ORGANICS).
12	10	[Dotted symbol]	20.0 / 1.3	MARINE DEPOSIT	36.3	S-12	24/24	20.0-22.0	Black-gray SAND, trace silt and organics (MARINE SAND).
13	9				25.6	S-13	24/24	22.0-24.0	Gray SAND, trace silt and organics (MARINE SAND).
14	8								
15	7	[Diagonal lines symbol]	24.0 / -2.7						
16	6								
17	5								
18	4								
19	3								
20	2								
21	1								
22	0								
23	-1								
24	-2								
25	-3								
	-4								

SOIL COMPONENT

<u>DESCRIPTIVE TERM</u>	<u>PROPORTION OF TOTAL</u>	
"TRACE"	0-10%	SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"
"SOME"	10-20%	
"ADJECTIVE" (eg SANDY, SILTY)	20-35%	
"AND"	35-50%	

Notes:
1-inch diameter observation well installed at about 15 feet.

Total Volatile Organic Compounds (TVOC) Measured with PID Model:
TVOC Background: ppm
Weather: Temperature:



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TEL: 617-868-1420
FAX: 617-868-1423

Page 1 of 1

Project: First Street P.U.D.	Job #: 5863	Geoprobe No.
Location: First St., Charles St., Hurley St.	Date Started: 11-11-15	GP-2
City/State: Cambridge, MA	Date Finished: 11-11-15	

Contractor: Technical Drilling Services, Inc.	Casing Type/Depth (ft): 2-1/8" O.D. Drive Tube	Groundwater Observations	
Driller/Helper: T. Newton	Casing Hammer (lbs)/Drop (in): N/A	Date	Depth
Logged By/Reviewed By: M. Sachs	Sampler Size/Type: 1-1/16" Plastic Sheath	11-11-15	8.6
Surface Elevation (ft): 20.9	Sampler Hammer (lbs)/Drop (in): N/A	Elev.	Notes
		12.3	

Depth (ft)	Elev. (ft)	Symbol	Depth/Elev. to Strata Change (ft)	Stratum	Sample				Sample Description and Notes	
					TVOC (ppm)	No.	Pen./Rec. (in)	Depth (ft)		
1	20	[Cross-hatch symbol]	8.0 / 12.9	FILL	0	S-1	24/12	0.0-2.0	Black SAND and SILT with ash, cinders, gravel, and brick (FILL).	
2	19				0	S-2	24/12	2.0-4.0	Brown, black, and orange SAND and SILT, trace clay with ash, cinders, gravel, and concrete (FILL).	
3	18				0.2	S-3	24/14	4.0-6.0	Orange-grey SAND with ash, cinders, gravel, and trace clay (FILL).	
4	17				0.1	S-4	24/24	6.0-8.0	Orange-grey SAND, SILT, and CLAY with gravel, ash, and cinders (FILL).	
5	16									
6	15									
7	14									
8	13									
9	12	[Downward arrows symbol]	22.0 / -1.1	ORGANICS	0.4	S-5	24/24	8.0-10.0	Black, silty ORGANICS, trace shells (ORGANICS).	
10	11				0.1	S-6	24/24	10.0-12.0	Black, silty ORGANICS, trace shells (ORGANICS).	
11	10				0.2	S-7	24/24	12.0-14.0	Black, silty ORGANICS, trace shells (ORGANICS).	
12	9				0.3	S-8	24/24	14.0-16.0	Black, silty ORGANICS, trace shells (ORGANICS).	
13	8				0.2	S-9	24/24	16.0-18.0	Black, silty ORGANICS, trace shells (ORGANICS).	
14	7				2.3	S-10	24/24	18.0-20.0	Black, silty ORGANICS, some peat (ORGANICS).	
15	6				0.3	S-11	24/24	20.0-22.0	Black, silty ORGANICS, trace shells (ORGANICS).	
16	5									
17	4									
18	3									
19	2									
20	1									
21	0									
22	-1									
23	-2	[Dotted symbol]	24.0 / -3.1	MARINE SAND	0.1	S-12	24/24	22.0-24.0	Grey-blue SAND, trace silt (MARINE SAND).	
24	-3									
25	-4									

SOIL COMPONENT

<u>DESCRIPTIVE TERM</u>	<u>PROPORTION OF TOTAL</u>	SOIL CONTAINING THREE COMPONENTS EACH OF WHICH COMPRISE AT LEAST 25% OF THE TOTAL ARE CLASSIFIED AS "A WELL-GRADED MIXTURE OF"
"TRACE"	0-10%	
"SOME"	10-20%	
"ADJECTIVE" (eg SANDY, SILTY)	20-35%	
"AND"	35-50%	

Notes:

Total Volatile Organic Compounds (TVOC) Measured with PID Model:
 TVOC Background: ppm
 Weather: Temperature:



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 CAMBRIDGE, MA 02140
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 FAX: 617-868-1423

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APPENDIX C:

**MCPHAIL ASSOCIATES, LLC'S
GROUNDWATER MONITORING REPORTS**

GROUNDWATER MONITORING REPORT

Well I.D.		Elevation Subtrahend (feet)	Job. No. Job Name			
B-204 (OW)		+20.6	5863 First Street PUD			
Date	Time	Elapsed Time (days)	Depth of Water from R-Box Top (feet)	Elevation of Water (feet)	Remarks	Read By
11/11/2015	14:15	Initial	13.0	+7.6	After Well Installation	TMC
11/13/2015	15:30	2	9.1	+11.5		TMC
11/18/2015	12:55	7	9.2	+11.4		SGH

GROUNDWATER MONITORING REPORT

Well I.D. B-205 (OW)		Elevation Subtrahend (feet) +21.0		Job. No. 5863 Job Name First Street PUD		
Date	Time	Elapsed Time (days)	Depth of Water from R-Box Top (feet)	Elevation of Water (feet)	Remarks	Read By
11/11/2015	14:15	Initial	Dry	-	After Well Installation	TMC
11/13/2015	15:30	2	8.4	+12.6		TMC
11/18/2015	12:19	7	7.7	+13.3		SGH

GROUNDWATER MONITORING REPORT

Well I.D. B-207 (OW)		Elevation Subtrahend (feet) +21.1	Job. No. 5863		Job Name First Street PUD	
Date	Time	Elapsed Time (days)	Depth of Water from R-Box Top (feet)	Elevation of Water (feet)	Remarks	Read By
11/11/2015	9:30	Initial	6.5	+14.6	After Well Installation	TMC
11/18/2015	11:34	7	10.0	+11.1		SGH

GROUNDWATER MONITORING REPORT

Well I.D.		Elevation Subtrahend (feet)		Job. No. Job Name		
Date	Time	Elapsed Time (days)	Depth of Water from R-Box Top (feet)	Elevation of Water (feet)	Remarks	Read By
GP-1 (OW)		+21.8		5863 First Street PUD		
11/11/2015	11:30	Initial	10.5	+11.3	After Well Installation	MGS
11/13/2015	15:30	2	10.4	+11.4		TMC
11/18/2015	10:20	7	11.0	+10.8		SGH



APPENDIX D:
SOIL ANALYTICAL DATA



ANALYTICAL REPORT

Lab Number:	L1529480
Client:	McPhail Associates 2269 Massachusetts Avenue Cambridge, MA 02140
ATTN:	Ambrose Donovan
Phone:	(617) 868-1420
Project Name:	FIRST STREET PUD
Project Number:	5863.9.01
Report Date:	11/23/15

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

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), 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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1529480-01	B-203 7-12' FILL	SOIL	CAMBRIDGE, MA	11/11/15 08:00	11/11/15
L1529480-02	B-203 S6 11-12	SOIL	CAMBRIDGE, MA	11/11/15 08:00	11/11/15
L1529480-03	OP-1 S11 18-20	SOIL	CAMBRIDGE, MA	11/11/15 10:00	11/11/15
L1529480-04	B-205 S1 0.5-2	SOIL	CAMBRIDGE, MA	11/11/15 12:45	11/11/15
L1529480-05	B-204 S4 6-8	SOIL	CAMBRIDGE, MA	11/11/15 14:00	11/11/15
L1529480-06	B-207 0-6 FILL	SOIL	CAMBRIDGE, MA	11/11/15 14:50	11/11/15
L1529480-07	B-207 S2 2-4	SOIL	CAMBRIDGE, MA	11/11/15 14:50	11/11/15
L1529480-08	B-207 S3 4-6	SOIL	CAMBRIDGE, MA	11/11/15 15:10	11/11/15

Project Name: FIRST STREET PUD

Lab Number: L1529480

Project Number: 5863.9.01

Report Date: 11/23/15

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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

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. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. 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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Case Narrative (continued)

Report Submission

This report replaces the report issued November 18, 2015. The Client ID was changed on L1529480-05.

MCP Related Narratives

Sample Receipt

L1529480-02 and -07: The samples submitted for Volatile Organics were received without raw soil for the Total Solids analysis. The Total Solids results from the corresponding composite samples were utilized in the dry weight calculation of the Volatile Organics data.

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 L1529480-02, -04, -05 and -07, did not meet the method required minimum response factor on the lowest calibration standard for chloroethane (0.17667), acetone (0.07773), 2-butanone (0.08870), and 1,4-dioxane (0.00360), as well as the average response factor for chloroethane, acetone, 2-butanone and 1,4-dioxane. The initial calibration verification is outside acceptance criteria for dichlorodifluoromethane (140%) and 1,4-dioxane (63%), but within overall method criteria.

The continuing calibration standard, associated with L1529480-02, -04, -05 and -07, 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 G:

L1529480-04: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

The surrogate recovery for L1529480-04 is outside the acceptance criteria for o-terphenyl (438%); however, the sample was not re-extracted due to coelution with obvious interferences. A copy of the chromatogram is

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Case Narrative (continued)

included as an attachment to this report. The results are not considered to be biased.

VPH

In reference to question I:

L1529480-04 and -05 were analyzed for a subset of MCP analytes per the Chain of Custody.

Metals

In reference to question I:

All samples were analyzed for a subset of MCP analytes 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:

 Lura L Troy

Title: Technical Director/Representative

Date: 11/23/15

ORGANICS

VOLATILES

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-07
 Client ID: B-207 S2 2-4
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil
 Analytical Method: 97,8260C
 Analytical Date: 11/17/15 00:12
 Analyst: PP
 Percent Solids: 84%

Date Collected: 11/11/15 14:50
 Date Received: 11/11/15
 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	20	--	1
1,1-Dichloroethane	ND		ug/kg	3.0	--	1
Chloroform	ND		ug/kg	3.0	--	1
Carbon tetrachloride	ND		ug/kg	2.0	--	1
1,2-Dichloropropane	ND		ug/kg	7.0	--	1
Dibromochloromethane	ND		ug/kg	2.0	--	1
1,1,2-Trichloroethane	ND		ug/kg	3.0	--	1
Tetrachloroethene	ND		ug/kg	2.0	--	1
Chlorobenzene	ND		ug/kg	2.0	--	1
Trichlorofluoromethane	ND		ug/kg	8.0	--	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	8.0	--	1
Bromoform	ND		ug/kg	8.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	2.0	--	1
Benzene	ND		ug/kg	2.0	--	1
Toluene	ND		ug/kg	3.0	--	1
Ethylbenzene	ND		ug/kg	2.0	--	1
Chloromethane	ND		ug/kg	8.0	--	1
Bromomethane	ND		ug/kg	4.0	--	1
Vinyl chloride	ND		ug/kg	4.0	--	1
Chloroethane	ND		ug/kg	4.0	--	1
1,1-Dichloroethene	ND		ug/kg	2.0	--	1
trans-1,2-Dichloroethene	ND		ug/kg	3.0	--	1
Trichloroethene	ND		ug/kg	2.0	--	1
1,2-Dichlorobenzene	ND		ug/kg	8.0	--	1

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-07
Client ID: B-207 S2 2-4
Sample Location: CAMBRIDGE, MA

Date Collected: 11/11/15 14:50
Date Received: 11/11/15
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	8.0	--	1
1,4-Dichlorobenzene	ND		ug/kg	8.0	--	1
Methyl tert butyl ether	ND		ug/kg	4.0	--	1
p/m-Xylene	ND		ug/kg	4.0	--	1
o-Xylene	ND		ug/kg	4.0	--	1
Xylenes, Total	ND		ug/kg	4.0	--	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	8.0	--	1
1,2,3-Trichloropropane	ND		ug/kg	8.0	--	1
Styrene	ND		ug/kg	4.0	--	1
Dichlorodifluoromethane	ND		ug/kg	20	--	1
Acetone	ND		ug/kg	72	--	1
Carbon disulfide	ND		ug/kg	8.0	--	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	8.0	--	1
Tetrahydrofuran	ND		ug/kg	8.0	--	1
2,2-Dichloropropane	ND		ug/kg	10	--	1
1,2-Dibromoethane	ND		ug/kg	8.0	--	1
1,3-Dichloropropane	ND		ug/kg	8.0	--	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	8.0	--	1
o-Chlorotoluene	ND		ug/kg	8.0	--	1
p-Chlorotoluene	ND		ug/kg	8.0	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	8.0	--	1
Hexachlorobutadiene	ND		ug/kg	8.0	--	1
Isopropylbenzene	ND		ug/kg	2.0	--	1
p-Isopropyltoluene	ND		ug/kg	2.0	--	1
Naphthalene	ND		ug/kg	8.0	--	1
n-Propylbenzene	ND		ug/kg	2.0	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	8.0	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	8.0	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	8.0	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	8.0	--	1

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-07
 Client ID: B-207 S2 2-4
 Sample Location: CAMBRIDGE, MA

Date Collected: 11/11/15 14:50
 Date Received: 11/11/15
 Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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MCP Volatile Organics by 8260/5035 - Westborough Lab

Diethyl ether	ND		ug/kg	10	--	1
Diisopropyl Ether	ND		ug/kg	8.0	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	8.0	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	8.0	--	1
1,4-Dioxane	ND		ug/kg	80	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	98		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	101		70-130

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 11/16/15 22:01
Analyst: PP

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02,04-05,07 Batch: WG841462-3					
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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 11/16/15 22:01
Analyst: PP

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02,04-05,07 Batch: WG841462-3					
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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 97,8260C
Analytical Date: 11/16/15 22:01
Analyst: PP

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02,04-05,07 Batch: WG841462-3					
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	94		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	100		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529480

Project Number: 5863.9.01

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02,04-05,07 Batch: WG841462-1 WG841462-2								
Methylene chloride	102		103		70-130	1		20
1,1-Dichloroethane	104		104		70-130	0		20
Chloroform	105		105		70-130	0		20
Carbon tetrachloride	106		106		70-130	0		20
1,2-Dichloropropane	99		99		70-130	0		20
Dibromochloromethane	101		102		70-130	1		20
1,1,2-Trichloroethane	101		102		70-130	1		20
Tetrachloroethene	114		111		70-130	3		20
Chlorobenzene	106		106		70-130	0		20
Trichlorofluoromethane	109		105		70-130	4		20
1,2-Dichloroethane	98		99		70-130	1		20
1,1,1-Trichloroethane	108		107		70-130	1		20
Bromodichloromethane	101		101		70-130	0		20
trans-1,3-Dichloropropene	100		101		70-130	1		20
cis-1,3-Dichloropropene	103		103		70-130	0		20
1,1-Dichloropropene	109		105		70-130	4		20
Bromoform	100		100		70-130	0		20
1,1,2,2-Tetrachloroethane	99		97		70-130	2		20
Benzene	107		105		70-130	2		20
Toluene	104		102		70-130	2		20
Ethylbenzene	110		108		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529480

Project Number: 5863.9.01

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02,04-05,07 Batch: WG841462-1 WG841462-2								
Chloromethane	93		93		70-130	0		20
Bromomethane	114		112		70-130	2		20
Vinyl chloride	109		108		70-130	1		20
Chloroethane	129		123		70-130	5		20
1,1-Dichloroethene	100		103		70-130	3		20
trans-1,2-Dichloroethene	108		107		70-130	1		20
Trichloroethene	111		111		70-130	0		20
1,2-Dichlorobenzene	106		106		70-130	0		20
1,3-Dichlorobenzene	110		108		70-130	2		20
1,4-Dichlorobenzene	109		107		70-130	2		20
Methyl tert butyl ether	99		100		70-130	1		20
p/m-Xylene	111		110		70-130	1		20
o-Xylene	110		108		70-130	2		20
cis-1,2-Dichloroethene	106		105		70-130	1		20
Dibromomethane	99		100		70-130	1		20
1,2,3-Trichloropropane	100		98		70-130	2		20
Styrene	110		108		70-130	2		20
Dichlorodifluoromethane	94		94		70-130	0		20
Acetone	88		90		70-130	2		20
Carbon disulfide	96		107		70-130	11		20
Methyl ethyl ketone	89		92		70-130	3		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529480

Project Number: 5863.9.01

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02,04-05,07 Batch: WG841462-1 WG841462-2								
Methyl isobutyl ketone	94		92		70-130	2		20
2-Hexanone	88		88		70-130	0		20
Bromochloromethane	109		110		70-130	1		20
Tetrahydrofuran	97		104		70-130	7		20
2,2-Dichloropropane	109		108		70-130	1		20
1,2-Dibromoethane	103		103		70-130	0		20
1,3-Dichloropropane	99		101		70-130	2		20
1,1,1,2-Tetrachloroethane	106		104		70-130	2		20
Bromobenzene	106		104		70-130	2		20
n-Butylbenzene	114		109		70-130	4		20
sec-Butylbenzene	111		108		70-130	3		20
tert-Butylbenzene	112		108		70-130	4		20
o-Chlorotoluene	110		105		70-130	5		20
p-Chlorotoluene	110		107		70-130	3		20
1,2-Dibromo-3-chloropropane	102		98		70-130	4		20
Hexachlorobutadiene	119		115		70-130	3		20
Isopropylbenzene	111		108		70-130	3		20
p-Isopropyltoluene	114		110		70-130	4		20
Naphthalene	102		101		70-130	1		20
n-Propylbenzene	112		108		70-130	4		20
1,2,3-Trichlorobenzene	110		108		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529480

Project Number: 5863.9.01

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 02,04-05,07 Batch: WG841462-1 WG841462-2								
1,2,4-Trichlorobenzene	117		112		70-130	4		20
1,3,5-Trimethylbenzene	113		109		70-130	4		20
1,2,4-Trimethylbenzene	110		107		70-130	3		20
Diethyl ether	108		109		70-130	1		20
Diisopropyl Ether	94		95		70-130	1		20
Ethyl-Tert-Butyl-Ether	96		97		70-130	1		20
Tertiary-Amyl Methyl Ether	99		101		70-130	2		20
1,4-Dioxane	94		99		70-130	5		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	95		95		70-130
Toluene-d8	99		98		70-130
4-Bromofluorobenzene	100		96		70-130
Dibromofluoromethane	98		100		70-130

SEMIVOLATILES

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-06
 Client ID: B-207 0-6 FILL
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil
 Analytical Method: 97,8270D
 Analytical Date: 11/15/15 20:17
 Analyst: AS
 Percent Solids: 84%

Date Collected: 11/11/15 14:50
 Date Received: 11/11/15
 Field Prep: Not Specified
 Extraction Method: EPA 3546
 Extraction Date: 11/14/15 13:53

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	2200		ug/kg	160	--	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	12000	E	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	160	--	1
Isophorone	ND		ug/kg	170	--	1
Naphthalene	1600		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	6800		ug/kg	120	--	1
Benzo(a)pyrene	6000		ug/kg	160	--	1
Benzo(b)fluoranthene	7600		ug/kg	120	--	1

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-06
Client ID: B-207 0-6 FILL
Sample Location: CAMBRIDGE, MA

Date Collected: 11/11/15 14:50
Date Received: 11/11/15
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	2500		ug/kg	120	--	1
Chrysene	6200		ug/kg	120	--	1
Acenaphthylene	410		ug/kg	160	--	1
Anthracene	5000		ug/kg	120	--	1
Benzo(ghi)perylene	3300		ug/kg	160	--	1
Fluorene	2400		ug/kg	190	--	1
Phenanthrene	12000	E	ug/kg	120	--	1
Dibenzo(a,h)anthracene	870		ug/kg	120	--	1
Indeno(1,2,3-cd)Pyrene	4000		ug/kg	160	--	1
Pyrene	11000	E	ug/kg	120	--	1
Aniline	ND		ug/kg	230	--	1
4-Chloroaniline	ND		ug/kg	190	--	1
Dibenzofuran	1800		ug/kg	190	--	1
2-Methylnaphthalene	900		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	77		30-130
Phenol-d6	82		30-130
Nitrobenzene-d5	91		30-130
2-Fluorobiphenyl	79		30-130
2,4,6-Tribromophenol	89		30-130
4-Terphenyl-d14	61		30-130

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-06 D
 Client ID: B-207 0-6 FILL
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil
 Analytical Method: 97,8270D
 Analytical Date: 11/17/15 13:35
 Analyst: AS
 Percent Solids: 84%

Date Collected: 11/11/15 14:50
 Date Received: 11/11/15
 Field Prep: Not Specified
 Extraction Method: EPA 3546
 Extraction Date: 11/14/15 13:53

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Fluoranthene	13000		ug/kg	230	--	2
Phenanthrene	13000		ug/kg	230	--	2
Pyrene	11000		ug/kg	230	--	2

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 11/16/15 14:41
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 11/14/15 13:53

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01,06 Batch: WG840765-1					
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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 11/16/15 14:41
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 11/14/15 13:53

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01,06 Batch: WG840765-1					
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	800	--
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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 97,8270D
Analytical Date: 11/16/15 14:41
Analyst: AS

Extraction Method: EPA 3546
Extraction Date: 11/14/15 13:53

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01,06 Batch: WG840765-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	72		30-130
Phenol-d6	74		30-130
Nitrobenzene-d5	72		30-130
2-Fluorobiphenyl	75		30-130
2,4,6-Tribromophenol	75		30-130
4-Terphenyl-d14	80		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529480

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01,06 Batch: WG840765-2 WG840765-3								
Acenaphthene	56		71		40-140	24		30
1,2,4-Trichlorobenzene	59		69		40-140	16		30
Hexachlorobenzene	57		73		40-140	25		30
Bis(2-chloroethyl)ether	61		69		40-140	12		30
2-Chloronaphthalene	61		72		40-140	17		30
1,2-Dichlorobenzene	59		66		40-140	11		30
1,3-Dichlorobenzene	58		64		40-140	10		30
1,4-Dichlorobenzene	59		66		40-140	11		30
3,3'-Dichlorobenzidine	41		56		40-140	31	Q	30
2,4-Dinitrotoluene	61		77		40-140	23		30
2,6-Dinitrotoluene	67		78		40-140	15		30
Azobenzene	59		74		40-140	23		30
Fluoranthene	61		76		40-140	22		30
4-Bromophenyl phenyl ether	58		75		40-140	26		30
Bis(2-chloroisopropyl)ether	64		73		40-140	13		30
Bis(2-chloroethoxy)methane	62		73		40-140	16		30
Hexachlorobutadiene	59		67		40-140	13		30
Hexachloroethane	60		67		40-140	11		30
Isophorone	63		72		40-140	13		30
Naphthalene	60		72		40-140	18		30
Nitrobenzene	62		71		40-140	14		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529480

Project Number: 5863.9.01

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01,06 Batch: WG840765-2 WG840765-3								
Bis(2-Ethylhexyl)phthalate	60		78		40-140	26		30
Butyl benzyl phthalate	64		78		40-140	20		30
Di-n-butylphthalate	61		78		40-140	24		30
Di-n-octylphthalate	58		75		40-140	26		30
Diethyl phthalate	60		74		40-140	21		30
Dimethyl phthalate	58		74		40-140	24		30
Benzo(a)anthracene	56		72		40-140	25		30
Benzo(a)pyrene	60		76		40-140	24		30
Benzo(b)fluoranthene	60		77		40-140	25		30
Benzo(k)fluoranthene	56		72		40-140	25		30
Chrysene	57		72		40-140	23		30
Acenaphthylene	62		74		40-140	18		30
Anthracene	59		73		40-140	21		30
Benzo(ghi)perylene	56		72		40-140	25		30
Fluorene	58		73		40-140	23		30
Phenanthrene	58		73		40-140	23		30
Dibenzo(a,h)anthracene	57		74		40-140	26		30
Indeno(1,2,3-cd)Pyrene	56		73		40-140	26		30
Pyrene	60		75		40-140	22		30
Aniline	39	Q	48		40-140	21		30
4-Chloroaniline	67		75		40-140	11		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529480

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01,06 Batch: WG840765-2 WG840765-3								
Dibenzofuran	57		73		40-140	25		30
2-Methylnaphthalene	61		72		40-140	17		30
Acetophenone	72		83		40-140	14		30
2,4,6-Trichlorophenol	64		79		30-130	21		30
2-Chlorophenol	62		71		30-130	14		30
2,4-Dichlorophenol	64		75		30-130	16		30
2,4-Dimethylphenol	64		75		30-130	16		30
2-Nitrophenol	66		76		30-130	14		30
4-Nitrophenol	60		76		30-130	24		30
2,4-Dinitrophenol	44		49		30-130	11		30
Pentachlorophenol	48		59		30-130	21		30
Phenol	62		72		30-130	15		30
2-Methylphenol	63		73		30-130	15		30
3-Methylphenol/4-Methylphenol	69		80		30-130	15		30
2,4,5-Trichlorophenol	64		76		30-130	17		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01,06 Batch: WG840765-2 WG840765-3								

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria
2-Fluorophenol	61		68		30-130
Phenol-d6	63		73		30-130
Nitrobenzene-d5	65		72		30-130
2-Fluorobiphenyl	62		73		30-130
2,4,6-Tribromophenol	60		77		30-130
4-Terphenyl-d14	59		72		30-130

PETROLEUM HYDROCARBONS

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-06 D
 Client ID: B-207 0-6 FILL
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil
 Analytical Method: 1,8015C(M)
 Analytical Date: 11/17/15 00:34
 Analyst: DG
 Percent Solids: 84%

Date Collected: 11/11/15 14:50
 Date Received: 11/11/15
 Field Prep: Not Specified
 Extraction Method: EPA 3546
 Extraction Date: 11/15/15 00:37

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Petroleum Hydrocarbon Quantitation - Westborough Lab						
--	--	--	--	--	--	--

TPH	400000		ug/kg	194000	--	5
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	80		40-140

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015C(M)
Analytical Date: 11/16/15 09:43
Analyst: DG

Extraction Method: EPA 3546
Extraction Date: 11/15/15 00:37

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01,06 Batch: WG840821-1					
TPH	ND		ug/kg	31700	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	83		40-140

Lab Control Sample Analysis Batch Quality Control

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01,06 Batch: WG840821-2								
TPH	96		-		40-140	-		40

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> <i>Criteria</i>
o-Terphenyl	85				40-140

PCBS

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-06
 Client ID: B-207 0-6 FILL
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil
 Analytical Method: 97,8082A
 Analytical Date: 11/17/15 00:50
 Analyst: JW
 Percent Solids: 84%

Date Collected: 11/11/15 14:50
 Date Received: 11/11/15
 Field Prep: Not Specified
 Extraction Method: EPA 3546
 Extraction Date: 11/14/15 13:02
 Cleanup Method: EPA 3665A
 Cleanup Date: 11/15/15
 Cleanup Method: EPA 3660B
 Cleanup Date: 11/15/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	38.0	--	1	A
Aroclor 1221	ND		ug/kg	38.0	--	1	A
Aroclor 1232	ND		ug/kg	38.0	--	1	A
Aroclor 1242	ND		ug/kg	38.0	--	1	A
Aroclor 1248	ND		ug/kg	38.0	--	1	A
Aroclor 1254	ND		ug/kg	38.0	--	1	A
Aroclor 1260	ND		ug/kg	38.0	--	1	A
Aroclor 1262	ND		ug/kg	38.0	--	1	A
Aroclor 1268	ND		ug/kg	38.0	--	1	A
PCBs, Total	ND		ug/kg	38.0	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	63		30-150	A
Decachlorobiphenyl	84		30-150	A
2,4,5,6-Tetrachloro-m-xylene	71		30-150	B
Decachlorobiphenyl	102		30-150	B

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
 Analytical Date: 11/16/15 23:13
 Analyst: JW

Extraction Method: EPA 3546
 Extraction Date: 11/14/15 13:02
 Cleanup Method: EPA 3665A
 Cleanup Date: 11/15/15
 Cleanup Method: EPA 3660B
 Cleanup Date: 11/15/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01,06 Batch: WG840754-1						
Aroclor 1016	ND		ug/kg	33.1	--	A
Aroclor 1221	ND		ug/kg	33.1	--	A
Aroclor 1232	ND		ug/kg	33.1	--	A
Aroclor 1242	ND		ug/kg	33.1	--	A
Aroclor 1248	ND		ug/kg	33.1	--	A
Aroclor 1254	ND		ug/kg	33.1	--	A
Aroclor 1260	ND		ug/kg	33.1	--	A
Aroclor 1262	ND		ug/kg	33.1	--	A
Aroclor 1268	ND		ug/kg	33.1	--	A
PCBs, Total	ND		ug/kg	33.1	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	75		30-150	A
Decachlorobiphenyl	98		30-150	A
2,4,5,6-Tetrachloro-m-xylene	85		30-150	B
Decachlorobiphenyl	101		30-150	B



Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529480

Project Number: 5863.9.01

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01,06 Batch: WG840754-2 WG840754-3									
Aroclor 1016	69		74		40-140	7		30	A
Aroclor 1260	83		91		40-140	9		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	72		75		30-150	A
Decachlorobiphenyl	95		105		30-150	A
2,4,5,6-Tetrachloro-m-xylene	78		82		30-150	B
Decachlorobiphenyl	93		102		30-150	B

METALS

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-06
 Client ID: B-207 0-6 FILL
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil
 Percent Solids: 84%

Date Collected: 11/11/15 14:50
 Date Received: 11/11/15
 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	28		mg/kg	0.46	--	1	11/12/15 18:30	11/12/15 22:35	EPA 3050B	97,6010C	JH
Barium, Total	200		mg/kg	0.46	--	1	11/12/15 18:30	11/12/15 22:35	EPA 3050B	97,6010C	JH
Cadmium, Total	ND		mg/kg	0.46	--	1	11/12/15 18:30	11/12/15 22:35	EPA 3050B	97,6010C	JH
Chromium, Total	26		mg/kg	0.46	--	1	11/12/15 18:30	11/12/15 22:35	EPA 3050B	97,6010C	JH
Lead, Total	1000		mg/kg	2.3	--	1	11/12/15 18:30	11/12/15 22:35	EPA 3050B	97,6010C	JH
Mercury, Total	1.59		mg/kg	0.079	--	1	11/13/15 08:35	11/16/15 10:30	EPA 7471B	97,7471B	DB
Selenium, Total	ND		mg/kg	2.3	--	1	11/12/15 18:30	11/12/15 22:35	EPA 3050B	97,6010C	JH
Silver, Total	ND		mg/kg	0.46	--	1	11/12/15 18:30	11/12/15 22:35	EPA 3050B	97,6010C	JH



Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

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): 01,06 Batch: WG840156-1									
Arsenic, Total	ND	mg/kg	0.40	--	1	11/12/15 18:30	11/12/15 22:00	97,6010C	JH
Barium, Total	ND	mg/kg	0.40	--	1	11/12/15 18:30	11/12/15 22:00	97,6010C	JH
Cadmium, Total	ND	mg/kg	0.40	--	1	11/12/15 18:30	11/12/15 22:00	97,6010C	JH
Chromium, Total	ND	mg/kg	0.40	--	1	11/12/15 18:30	11/12/15 22:00	97,6010C	JH
Lead, Total	ND	mg/kg	2.0	--	1	11/12/15 18:30	11/12/15 22:00	97,6010C	JH
Selenium, Total	ND	mg/kg	2.0	--	1	11/12/15 18:30	11/12/15 22:00	97,6010C	JH
Silver, Total	ND	mg/kg	0.40	--	1	11/12/15 18:30	11/12/15 22:00	97,6010C	JH

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): 01,06 Batch: WG840241-1									
Mercury, Total	ND	mg/kg	0.083	--	1	11/13/15 08:35	11/16/15 10:21	97,7471B	DB

Prep Information

Digestion Method: EPA 7471B

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529480

Report Date: 11/23/15

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
MCP Total Metals - Westborough Lab Associated sample(s): 01,06 Batch: WG840156-2 WG840156-3 SRM Lot Number: D088-540								
Arsenic, Total	88		88		79-121	0		30
Barium, Total	83		116		83-117	33	Q	30
Cadmium, Total	84		85		83-117	1		30
Chromium, Total	84		82		80-120	2		30
Lead, Total	98		95		81-117	3		30
Selenium, Total	91		91		78-122	0		30
Silver, Total	88		88		75-124	0		30
MCP Total Metals - Westborough Lab Associated sample(s): 01,06 Batch: WG840241-2 WG840241-3 SRM Lot Number: D088-540								
Mercury, Total	101		101		72-128	0		30

INORGANICS & MISCELLANEOUS

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-06
Client ID: B-207 0-6 FILL
Sample Location: CAMBRIDGE, MA
Matrix: Soil

Date Collected: 11/11/15 14:50
Date Received: 11/11/15
Field Prep: Not Specified

Test Material Information

Source of Material: Unknown
Description of Material: Non-Metallic - Damp Soil
Particle Size: Medium
Preliminary Burning Time (sec): 120

Parameter	Result	Date Analyzed	Analytical Method	Analyst
Ignitability of Solids - Westborough Lab				
Ignitability	NI	11/14/15 17:29	1,1030	AB



Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-06
Client ID: B-207 0-6 FILL
Sample Location: CAMBRIDGE, MA
Matrix: Soil

Date Collected: 11/11/15 14:50
Date Received: 11/11/15
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance	100		umhos/cm	10	--	1	-	11/12/15 18:02	1,9050A	KZ
Solids, Total	83.7		%	0.100	NA	1	-	11/12/15 14:50	30,2540G	SG
pH (H)	8.0		SU	-	NA	1	-	11/12/15 05:30	1,9045D	LH
Cyanide, Reactive	ND		mg/kg	10	--	1	11/12/15 22:20	11/12/15 23:58	1,7.3	TL
Sulfide, Reactive	ND		mg/kg	10	--	1	11/12/15 22:20	11/13/15 00:05	1,7.3	TL



Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529480

Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529480-07
 Client ID: B-207 S2 2-4
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil

Date Collected: 11/11/15 14:50
 Date Received: 11/11/15
 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	83.7		%	0.100	NA	1	-	11/12/15 14:50	30,2540G	SG



Project Name: FIRST STREET PUD

Lab Number: L1529480

Project Number: 5863.9.01

Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01,06 Batch: WG840147-1										
Cyanide, Reactive	ND		mg/kg	10	--	1	11/12/15 22:20	11/12/15 23:55	1,7.3	TL
General Chemistry - Westborough Lab for sample(s): 01,06 Batch: WG840149-1										
Sulfide, Reactive	ND		mg/kg	10	--	1	11/12/15 22:20	11/13/15 00:03	1,7.3	TL

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529480

Report Date: 11/23/15

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
General Chemistry - Westborough Lab Associated sample(s): 01,06 Batch: WG839834-1								
pH	100		-		99-101	-		
General Chemistry - Westborough Lab Associated sample(s): 01,06 Batch: WG840140-1								
Specific Conductance	94		-		80-120	-		
General Chemistry - Westborough Lab Associated sample(s): 01,06 Batch: WG840147-2								
Cyanide, Reactive	33		-		30-125	-		40
General Chemistry - Westborough Lab Associated sample(s): 01,06 Batch: WG840149-2								
Sulfide, Reactive	110		-		60-125	-		40

Lab Duplicate Analysis
Batch Quality Control

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529480

Report Date: 11/23/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-07 QC Batch ID: WG840071-1 QC Sample: L1529480-01 Client ID: B-203 7-12' FILL						
Solids, Total	69.3	73.8	%	6		20

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: 11/12/2015 03:24

Cooler Information Custody Seal

Cooler

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1529480-01A	Glass 500ml/16oz unpreserved	A	N/A	3.5	Y	Absent	IGNIT-1030(14),MCP-8082-10(365),MCP-CR-6010T-10(180),REACTS(14),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),PH-9045(1),MCP(),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),REACTCN(14),TPH-DRO-D(14),COND-9050(28),MCP-PB-6010T-10(180)
L1529480-02A	Vial MeOH preserved	A	N/A	3.5	Y	Absent	MCP-8260HLW-10(14)
L1529480-02B	Vial water preserved	A	N/A	3.5	Y	Absent	MCP-8260HLW-10(14)
L1529480-02C	Vial water preserved	A	N/A	3.5	Y	Absent	MCP-8260HLW-10(14)
L1529480-03A	Vial MeOH preserved	A	N/A	3.5	Y	Absent	VPH-DELUX-10(28)
L1529480-03B	Vial MeOH preserved	A	N/A	3.5	Y	Absent	VPH-DELUX-10(28)
L1529480-03C	Plastic 2oz unpreserved for TS	A	N/A	3.5	Y	Absent	TS(7)
L1529480-03D	Glass 120ml/4oz unpreserved	A	N/A	3.5	Y	Absent	EPH-DELUX-10(14)
L1529480-04A	Vial MeOH preserved	A	N/A	3.5	Y	Absent	VPH-10(28),MCP-8260HLW-10(14)
L1529480-04B	Vial water preserved	A	N/A	3.5	Y	Absent	MCP-8260HLW-10(14)
L1529480-04C	Vial water preserved	A	N/A	3.5	Y	Absent	MCP-8260HLW-10(14)
L1529480-04D	Glass 250ml/8oz unpreserved	A	N/A	3.5	Y	Absent	TS(7),EPH-DELUX-10(14)
L1529480-05A	Vial MeOH preserved	A	N/A	3.5	Y	Absent	VPH-10(28),MCP-8260HLW-10(14)
L1529480-05B	Vial water preserved	A	N/A	3.5	Y	Absent	MCP-8260HLW-10(14)
L1529480-05C	Vial water preserved	A	N/A	3.5	Y	Absent	MCP-8260HLW-10(14)
L1529480-05D	Glass 250ml/8oz unpreserved	A	N/A	3.5	Y	Absent	TS(7),EPH-DELUX-10(14)

*Values in parentheses indicate holding time in days

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529480

Report Date: 11/23/15

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1529480-06A	Glass 500ml/16oz unpreserved	A	N/A	3.5	Y	Absent	IGNIT-1030(14),MCP-8082-10(365),MCP-CR-6010T-10(180),REACTS(14),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),PH-9045(1),MCP(),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),REACTCN(14),TPH-DRO-D(14),COND-9050(28),MCP-PB-6010T-10(180)
L1529480-07A	Vial MeOH preserved	A	N/A	3.5	Y	Absent	MCP-8260HLW-10(14)
L1529480-07B	Vial water preserved	A	N/A	3.5	Y	Absent	MCP-8260HLW-10(14)
L1529480-07C	Vial water preserved	A	N/A	3.5	Y	Absent	MCP-8260HLW-10(14)
L1529480-08A	Vial MeOH preserved	A	N/A	3.5	Y	Absent	HOLD-8260HLW(14)
L1529480-08B	Vial water preserved	A	N/A	3.5	Y	Absent	HOLD-8260HLW(14)
L1529480-08C	Vial water preserved	A	N/A	3.5	Y	Absent	HOLD-8260HLW(14)
L1529480-08D	Vial MeOH preserved	A	N/A	3.5	Y	Absent	HOLD-VPH(28)
L1529480-08E	Glass 250ml/8oz unpreserved	A	N/A	3.5	Y	Absent	HOLD-EPH(14),HOLD-WETCHEM()

Container Comments

L1529480-01A

L1529480-06A

*Values in parentheses indicate holding time in days



Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

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.
LCS D	- 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.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
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.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

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).

Report Format: Data Usability Report



Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529480
Report Date: 11/23/15

Data Qualifiers

- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The 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.

Project Name: FIRST STREET PUD**Lab Number:** L1529480**Project Number:** 5863.9.01**Report Date:** 11/23/15

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 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.
- 100 Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of VPH under the Massachusetts Contingency Plan, WSC-CAM-IVA, 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

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

Westborough Facility

EPA 8260C: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene; Iodomethane (methyl iodide) (soil); Methyl methacrylate (soil); Azobenzene.

EPA 8270D: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 625: 4-Chloroaniline, 4-Methylphenol.

SM4500: Soil: Total Phosphorus, TKN, NO₂, NO₃.

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, SM4500CI-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 2

Project Information

Project Name: First Street PUD

Project Location: Cambridge, MA

Project #: 5863.9.01

Project Manager: Scott Smith

ALPHA Quote #:

Turn-Around Time

Standard Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Westborough, MA Mansfield, MA
 TEL: 508-898-9220 TEL: 508-822-9300
 FAX: 508-898-9193 FAX: 508-822-3288

Client Information

Client: McPhail Associates, LLC
 Address: 2269 Massachusetts Avenue
 Cambridge, MA 02140
 Phone: 617-868-1420
 Fax: 617-868-1423
 Email: ssmith@mcphailgeo.com

These samples have been Previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:
 Run TCLP if greater than 20x rule

Date Rec'd in Lab: 11/11/15

ALPHA Job #: LIS 29480

Report Information Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program

MA MCP

Criteria

RCS-1

ANALYSIS

Soil Mgmt Package IV	w/o VOC	VOC 8260 Low	VOC 8260 High (if low out of range)	Pesticides	Total Solids	MCP-14 Metals	EPH Deluxe	VPH Deluxe	VP#								
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TOTAL																	

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

TOTAL # BOTTLES

Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials
		Date	Time		
29480-01	B-203 7-12' F4	11/11/15	800	S	TMC
-02	B-203 S6 11-12		800		
-03	G-1 S11 18-20		1000		MGS
-04	B-205 S1 0.5-2		1245		TMC
-05	B-204 S4 6-8		1400		TMC

Container Type
 Preservative

A	V	V	A	P	A	A	V	-	-	-	-
A	O	F	A	A	A	A	F	-	-	-	-

Relinquished By:

Date/Time

Received By:

Date/Time

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 Payment Terms

7A
Volatile Organics CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1529480

Instrument ID: Voal04.i Calibration Date: 16-NOV-2015 Time: 20:43

Lab File ID: 1116N02 Init. Calib. Date(s): 02-NOV-2 03-NOV-2

Sample No: 8260 CCAL Init. Calib. Times : 17:21 07:19

Compound	RRF	RRF	MIN RRF	%D	MAX %D
dichlorodifluoromethane	.2886	.27219	.1	-6	20
chloromethane	.33904	.31485	.1	-7	20
vinyl chloride	.30289	.32925	.1	9	20
bromomethane	100	114	.1	14	20
chloroethane	.14322	.18543	.1	29	20
trichlorofluoromethane	.43243	.47236	.1	9	20
ethyl ether	.12263	.13225	.05	8	20
1,1,-dichloroethene	.27284	.27205	.1	0	20
carbon disulfide	1.0018	.96217	.1	-4	20
methylene chloride	.32885	.336	.1	2	20
acetone	.05618	.04923	.1	-12	20
trans-1,2-dichloroethene	.33031	.35614	.1	8	20
methyl tert butyl ether	.88309	.87128	.1	-1	20
Diisopropyl Ether	.91534	.86285	.05	-6	20
1,1-dichloroethane	.63917	.6658	.2	4	20
Ethyl-Tert-Butyl-Ether	1.0915	1.0495	.05	-4	20
cis-1,2-dichloroethene	.36438	.38666	.1	6	20
2,2-dichloropropane	.51529	.56394	.05	9	20
bromochloromethane	.16609	.18174	.05	9	20
chloroform	.61953	.65048	.2	5	20
carbontetrachloride	.50792	.54123	.1	7	20
tetrahydrofuran	.06688	.06463	.05	-3	20
1,1,1-trichloroethane	.57039	.61354	.1	8	20
2-butanone	.0888	.07922	.1	-11	20
1,1-dichloropropene	.42506	.46166	.05	9	20
benzene	1.2390	1.3209	.5	7	20
Tertiary-Amyl Methyl Ether	.8679	.85959	.05	-1	20
1,2-dichloroethane	.45946	.45191	.1	-2	20
trichloroethene	.35827	.39664	.2	11	20
dibromomethane	.19615	.19384	.05	-1	20
1,2-dichloropropane	.35416	.34968	.1	-1	20
bromodichloromethane	.4756	.48089	.2	1	20
1,4-dioxane	.00282	.00264	.05	-6	20
cis-1,3-dichloropropene	.51959	.53764	.2	3	20
toluene	1.0866	1.1283	.4	4	20
tetrachloroethene	.50704	.57894	.2	14	20
4-methyl-2-pentanone	.1058	.09934	.1	-6	20
trans-1,3-dichloropropene	.57719	.57978	.1	0	20

FORM VII MCP-8260HLW-10

7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1529480

Instrument ID: Voal04.i Calibration Date: 16-NOV-2015 Time: 20:43

Lab File ID: 1116N02 Init. Calib. Date(s): 02-NOV-2 03-NOV-2

Sample No: 8260 CCAL Init. Calib. Times : 17:21 07:19

Compound	RRF	RRF	MIN RRF	%D	MAX %D
1,1,2-trichloroethane	.27226	.27493	.1	1	20
chlorodibromomethane	.48211	.48862	.1	1	20
1,3-dichloropropane	.54253	.5371	.05	-1	20
1,2-dibromoethane	.34219	.3525	.1	3	20
2-hexanone	.18347	.16153	.1	-12	20
chlorobenzene	1.1963	1.2675	.5	6	20
ethyl benzene	1.9911	2.1810	.1	10	20
1,1,1,2-tetrachloroethane	.47101	.49978	.05	6	20
p/m xylene	.75501	.83918	.1	11	20
o xylene	.73828	.80897	.3	10	20
styrene	1.2095	1.3273	.3	10	20
bromoform	.53466	.53382	.1	0	20
isopropylbenzene	3.4141	3.7763	.1	11	20
bromobenzene	.97131	1.0281	.05	6	20
n-propylbenzene	4.0376	4.5140	.05	12	20
1,1,2,2,-tetrachloroethane	.71115	.70585	.3	-1	20
2-chlorotoluene	2.5569	2.8203	.05	10	20
1,2,3-trichloropropane	.55186	.55179	.05	0	20
1,3,5-trimethylbenzene	3.0307	3.4286	.05	13	20
4-chlorotoluene	2.5762	2.8444	.05	10	20
tert-butylbenzene	2.6006	2.9188	.05	12	20
1,2,4-trimethylbenzene	3.0824	3.4009	.05	10	20
sec-butylbenzene	3.7972	4.2155	.05	11	20
p-isopropyltoluene	3.3783	3.8461	.05	14	20
1,3-dichlorobenzene	1.8076	1.9929	.6	10	20
1,4-dichlorobenzene	1.8243	1.9958	.5	9	20
n-butylbenzene	2.8818	3.2768	.05	14	20
1,2-dichlorobenzene	1.6696	1.7710	.4	6	20
1,2-dibromo-3-chloropropane	.13103	.13376	.05	2	20
hexachlorobutadiene	.76962	.91811	.05	19	20
1,2,4-trichlorobenzene	1.2566	1.4698	.2	17	20
naphthalene	2.4971	2.5601	.05	3	20
1,2,3-trichlorobenzene	1.1749	1.2936	.05	10	20
dibromofluoromethane	.27524	.26895	.05	-2	30
1,2-dichloroethane-d4	.28099	.2673	.05	-5	30
toluene-d8	1.2876	1.2734	.05	-1	30
4-bromofluorobenzene	.89417	.89278	.05	0	30

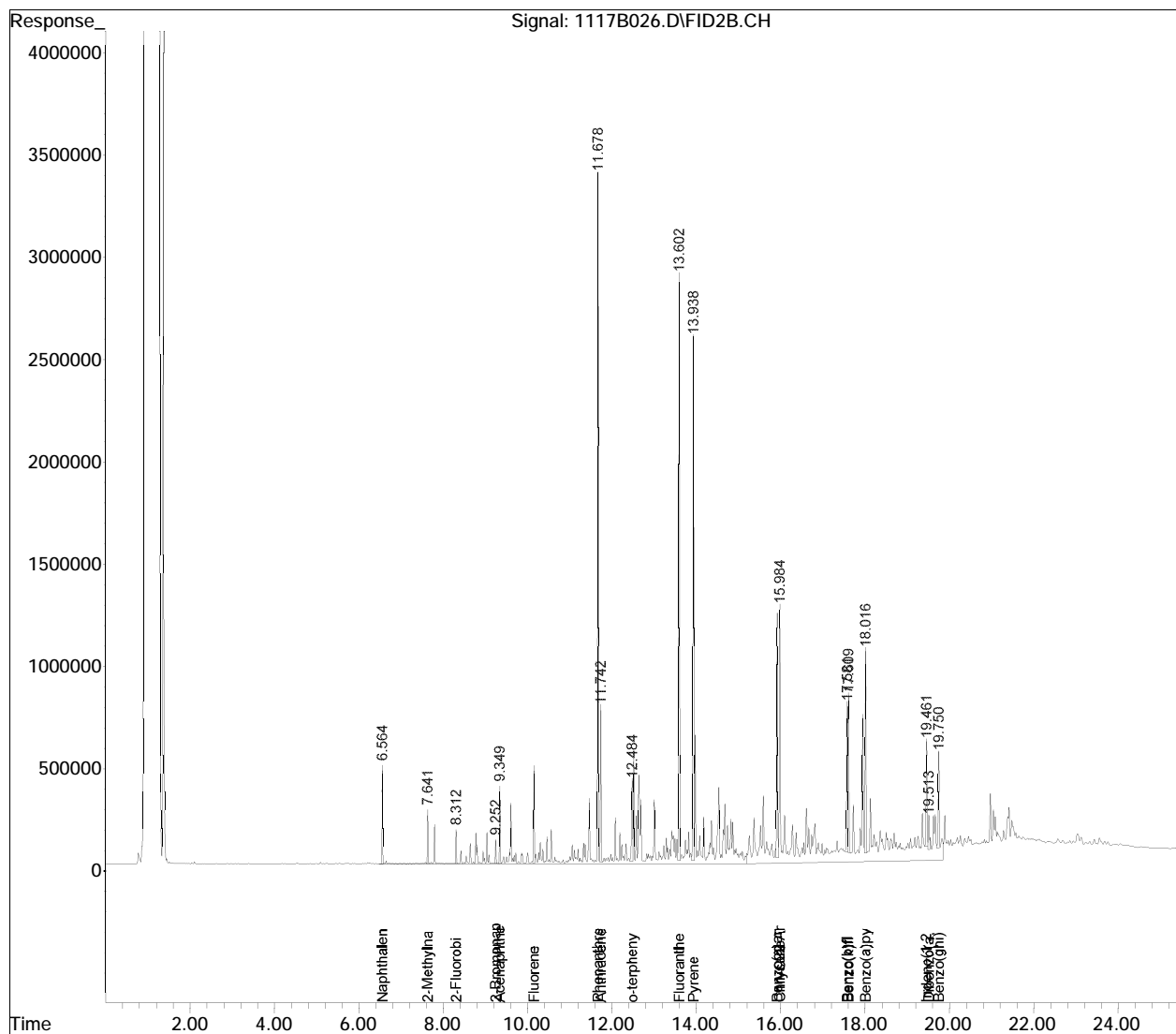
FORM VII MCP-8260HLW-10

Sub List : Default - All compounds listed Reviewed)

Data Path : I:\Petro10\151117.SEC\
 Data File : 1117B026.D
 Signal(s) : FID2B.CH
 Acq On : 17 Nov 2015 10:54 pm
 Operator : Petro10b:sr
 Sample : 11529480-04d,42,10,fv25x
 Misc : wg841534,wg840583,ICAL11324
 ALS Vial : 76 Sample Multiplier: 1

Integration File: events.e
 Quant Time: Nov 18 09:30:38 2015
 Quant Method : I:\Petro10\METHODS\MA ARO\MAARO150805N.M
 Quant Title : MA EPH Aromatic
 QLast Update : Fri Nov 13 08:23:17 2015
 Response via : Initial Calibration
 Integrator: ChemStation 6890 Scale Mode: Large solvent peaks clipped

Volume Inj. :
 Signal Phase :
 Signal Info :





ANALYTICAL REPORT

Lab Number:	L1529845
Client:	McPhail Associates 2269 Massachusetts Avenue Cambridge, MA 02140
ATTN:	Ambrose Donovan
Phone:	(617) 868-1420
Project Name:	FIRST STREET PUD
Project Number:	5863.9.01
Report Date:	11/23/15

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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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1529845-01	B-207 S2 2-4	SOIL	CAMBRIDGE, MA	11/11/15 14:50	11/13/15
L1529845-02	B-206 S1 0-2	SOIL	CAMBRIDGE, MA	11/13/15 10:30	11/13/15
L1529845-03	B-206 0-6 FILL	SOIL	CAMBRIDGE, MA	11/13/15 10:30	11/13/15

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

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. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. 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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Case Narrative (continued)

Report Submission

This report replaces the report issued November 20, 2015. The Client ID was changed on L1529845-02.

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 L1529845-02, did not meet the method required minimum response factor on the lowest calibration standard for bromomethane (0.09332) and 1,4-dioxane (0.00224), as well as the average response factor for bromomethane, acetone and 1,4-dioxane.

The continuing calibration standard, associated with L1529845-02, 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

L1529845-03: The sample has elevated detection limits due to the dilution required by the sample matrix.

VPH

In reference to question I:

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

Metals

In reference to question I:

All samples were analyzed for a subset of MCP analytes 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:

 Lura L Troy

Title: Technical Director/Representative

Date: 11/23/15

ORGANICS

VOLATILES

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-02
Client ID: B-206 S1 0-2
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Analytical Method: 97,8260C
Analytical Date: 11/20/15 15:33
Analyst: MV
Percent Solids: 89%

Date Collected: 11/13/15 10:30
Date Received: 11/13/15
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	2.8	--	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	7.5	--	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	7.5	--	1
Bromoform	ND		ug/kg	7.5	--	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	7.5	--	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	7.5	--	1

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-02
Client ID: B-206 S1 0-2
Sample Location: CAMBRIDGE, MA

Date Collected: 11/13/15 10:30
Date Received: 11/13/15
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	7.5	--	1
1,4-Dichlorobenzene	ND		ug/kg	7.5	--	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	7.5	--	1
1,2,3-Trichloropropane	ND		ug/kg	7.5	--	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	7.5	--	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	7.5	--	1
Tetrahydrofuran	ND		ug/kg	7.5	--	1
2,2-Dichloropropane	ND		ug/kg	9.4	--	1
1,2-Dibromoethane	ND		ug/kg	7.5	--	1
1,3-Dichloropropane	ND		ug/kg	7.5	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.9	--	1
Bromobenzene	ND		ug/kg	9.4	--	1
n-Butylbenzene	ND		ug/kg	1.9	--	1
sec-Butylbenzene	ND		ug/kg	1.9	--	1
tert-Butylbenzene	ND		ug/kg	7.5	--	1
o-Chlorotoluene	ND		ug/kg	7.5	--	1
p-Chlorotoluene	ND		ug/kg	7.5	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	7.5	--	1
Hexachlorobutadiene	ND		ug/kg	7.5	--	1
Isopropylbenzene	ND		ug/kg	1.9	--	1
p-Isopropyltoluene	ND		ug/kg	1.9	--	1
Naphthalene	ND		ug/kg	7.5	--	1
n-Propylbenzene	ND		ug/kg	1.9	--	1
1,2,3-Trichlorobenzene	ND		ug/kg	7.5	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	7.5	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	7.5	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	7.5	--	1

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-02
 Client ID: B-206 S1 0-2
 Sample Location: CAMBRIDGE, MA

Date Collected: 11/13/15 10:30
 Date Received: 11/13/15
 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	9.4	--	1
Diisopropyl Ether	ND		ug/kg	7.5	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	7.5	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	7.5	--	1
1,4-Dioxane	ND		ug/kg	75	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	83		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	95		70-130
Dibromofluoromethane	84		70-130

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 11/20/15 10:25
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02 Batch: WG842892-3					
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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8260C
Analytical Date: 11/20/15 10:25
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02 Batch: WG842892-3					
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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 97,8260C
Analytical Date: 11/20/15 10:25
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 02 Batch: WG842892-3					
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	83		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	91		70-130
Dibromofluoromethane	82		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529845

Project Number: 5863.9.01

Report Date: 11/23/15

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: WG842892-1 WG842892-2								
Methylene chloride	103		102		70-130	1		20
1,1-Dichloroethane	105		103		70-130	2		20
Chloroform	86		87		70-130	1		20
Carbon tetrachloride	65	Q	69	Q	70-130	6		20
1,2-Dichloropropane	115		113		70-130	2		20
Dibromochloromethane	75		80		70-130	6		20
1,1,2-Trichloroethane	111		109		70-130	2		20
Tetrachloroethene	89		91		70-130	2		20
Chlorobenzene	98		99		70-130	1		20
Trichlorofluoromethane	64	Q	70		70-130	9		20
1,2-Dichloroethane	83		87		70-130	5		20
1,1,1-Trichloroethane	71		75		70-130	5		20
Bromodichloromethane	82		85		70-130	4		20
trans-1,3-Dichloropropene	90		91		70-130	1		20
cis-1,3-Dichloropropene	99		101		70-130	2		20
1,1-Dichloropropene	98		99		70-130	1		20
Bromoform	81		88		70-130	8		20
1,1,2,2-Tetrachloroethane	115		115		70-130	0		20
Benzene	111		110		70-130	1		20
Toluene	102		101		70-130	1		20
Ethylbenzene	98		99		70-130	1		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529845

Project Number: 5863.9.01

Report Date: 11/23/15

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: WG842892-1 WG842892-2								
Chloromethane	104		94		70-130	10		20
Bromomethane	63	Q	67	Q	70-130	6		20
Vinyl chloride	69	Q	69	Q	70-130	0		20
Chloroethane	70		67	Q	70-130	4		20
1,1-Dichloroethene	93		96		70-130	3		20
trans-1,2-Dichloroethene	97		101		70-130	4		20
Trichloroethene	96		99		70-130	3		20
1,2-Dichlorobenzene	100		102		70-130	2		20
1,3-Dichlorobenzene	100		100		70-130	0		20
1,4-Dichlorobenzene	100		101		70-130	1		20
Methyl tert butyl ether	89		92		70-130	3		20
p/m-Xylene	104		104		70-130	0		20
o-Xylene	103		103		70-130	0		20
cis-1,2-Dichloroethene	99		103		70-130	4		20
Dibromomethane	92		96		70-130	4		20
1,2,3-Trichloropropane	107		108		70-130	1		20
Styrene	104		105		70-130	1		20
Dichlorodifluoromethane	70		74		70-130	6		20
Acetone	102		102		70-130	0		20
Carbon disulfide	110		101		70-130	9		20
Methyl ethyl ketone	107		105		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529845

Project Number: 5863.9.01

Report Date: 11/23/15

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: WG842892-1 WG842892-2								
Methyl isobutyl ketone	105		103		70-130	2		20
2-Hexanone	104		102		70-130	2		20
Bromochloromethane	96		98		70-130	2		20
Tetrahydrofuran	128		118		70-130	8		20
2,2-Dichloropropane	75		78		70-130	4		20
1,2-Dibromoethane	90		94		70-130	4		20
1,3-Dichloropropane	106		104		70-130	2		20
1,1,1,2-Tetrachloroethane	79		84		70-130	6		20
Bromobenzene	96		98		70-130	2		20
n-Butylbenzene	110		108		70-130	2		20
sec-Butylbenzene	106		104		70-130	2		20
tert-Butylbenzene	95		96		70-130	1		20
o-Chlorotoluene	98		98		70-130	0		20
p-Chlorotoluene	97		97		70-130	0		20
1,2-Dibromo-3-chloropropane	82		85		70-130	4		20
Hexachlorobutadiene	88		89		70-130	1		20
Isopropylbenzene	99		98		70-130	1		20
p-Isopropyltoluene	98		99		70-130	1		20
Naphthalene	100		101		70-130	1		20
n-Propylbenzene	109		107		70-130	2		20
1,2,3-Trichlorobenzene	100		100		70-130	0		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529845

Project Number: 5863.9.01

Report Date: 11/23/15

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: WG842892-1 WG842892-2								
1,2,4-Trichlorobenzene	103		104		70-130	1		20
1,3,5-Trimethylbenzene	98		98		70-130	0		20
1,2,4-Trimethylbenzene	97		97		70-130	0		20
Diethyl ether	106		105		70-130	1		20
Diisopropyl Ether	111		108		70-130	3		20
Ethyl-Tert-Butyl-Ether	99		98		70-130	1		20
Tertiary-Amyl Methyl Ether	97		98		70-130	1		20
1,4-Dioxane	108		115		70-130	6		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	81		84		70-130
Toluene-d8	101		99		70-130
4-Bromofluorobenzene	93		94		70-130
Dibromofluoromethane	86		90		70-130

SEMIVOLATILES

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-03 D
 Client ID: B-206 0-6 FILL
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil
 Analytical Method: 97,8270D
 Analytical Date: 11/18/15 18:37
 Analyst: PS
 Percent Solids: 89%

Date Collected: 11/13/15 10:30
 Date Received: 11/13/15
 Field Prep: Not Specified
 Extraction Method: EPA 3546
 Extraction Date: 11/17/15 22:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	680		ug/kg	290	--	2
1,2,4-Trichlorobenzene	ND		ug/kg	360	--	2
Hexachlorobenzene	ND		ug/kg	220	--	2
Bis(2-chloroethyl)ether	ND		ug/kg	330	--	2
2-Chloronaphthalene	ND		ug/kg	360	--	2
1,2-Dichlorobenzene	ND		ug/kg	360	--	2
1,3-Dichlorobenzene	ND		ug/kg	360	--	2
1,4-Dichlorobenzene	ND		ug/kg	360	--	2
3,3'-Dichlorobenzidine	ND		ug/kg	360	--	2
2,4-Dinitrotoluene	ND		ug/kg	360	--	2
2,6-Dinitrotoluene	ND		ug/kg	360	--	2
Azobenzene	ND		ug/kg	360	--	2
Fluoranthene	7100		ug/kg	220	--	2
4-Bromophenyl phenyl ether	ND		ug/kg	360	--	2
Bis(2-chloroisopropyl)ether	ND		ug/kg	440	--	2
Bis(2-chloroethoxy)methane	ND		ug/kg	390	--	2
Hexachlorobutadiene	ND		ug/kg	360	--	2
Hexachloroethane	ND		ug/kg	290	--	2
Isophorone	ND		ug/kg	330	--	2
Naphthalene	ND		ug/kg	360	--	2
Nitrobenzene	ND		ug/kg	330	--	2
Bis(2-Ethylhexyl)phthalate	ND		ug/kg	360	--	2
Butyl benzyl phthalate	ND		ug/kg	360	--	2
Di-n-butylphthalate	ND		ug/kg	360	--	2
Di-n-octylphthalate	ND		ug/kg	360	--	2
Diethyl phthalate	ND		ug/kg	360	--	2
Dimethyl phthalate	ND		ug/kg	360	--	2
Benzo(a)anthracene	3300		ug/kg	220	--	2
Benzo(a)pyrene	3100		ug/kg	290	--	2
Benzo(b)fluoranthene	4000		ug/kg	220	--	2

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-03 D
Client ID: B-206 0-6 FILL
Sample Location: CAMBRIDGE, MA

Date Collected: 11/13/15 10:30
Date Received: 11/13/15
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(k)fluoranthene	1300		ug/kg	220	--	2
Chrysene	3500		ug/kg	220	--	2
Acenaphthylene	440		ug/kg	290	--	2
Anthracene	1500		ug/kg	220	--	2
Benzo(ghi)perylene	1800		ug/kg	290	--	2
Fluorene	630		ug/kg	360	--	2
Phenanthrene	6100		ug/kg	220	--	2
Dibenzo(a,h)anthracene	470		ug/kg	220	--	2
Indeno(1,2,3-cd)Pyrene	2000		ug/kg	290	--	2
Pyrene	6400		ug/kg	220	--	2
Aniline	ND		ug/kg	440	--	2
4-Chloroaniline	ND		ug/kg	360	--	2
Dibenzofuran	380		ug/kg	360	--	2
2-Methylnaphthalene	ND		ug/kg	440	--	2
Acetophenone	ND		ug/kg	360	--	2
2,4,6-Trichlorophenol	ND		ug/kg	220	--	2
2-Chlorophenol	ND		ug/kg	360	--	2
2,4-Dichlorophenol	ND		ug/kg	330	--	2
2,4-Dimethylphenol	ND		ug/kg	360	--	2
2-Nitrophenol	ND		ug/kg	790	--	2
4-Nitrophenol	ND		ug/kg	510	--	2
2,4-Dinitrophenol	ND		ug/kg	1700	--	2
Pentachlorophenol	ND		ug/kg	730	--	2
Phenol	ND		ug/kg	360	--	2
2-Methylphenol	ND		ug/kg	360	--	2
3-Methylphenol/4-Methylphenol	ND		ug/kg	520	--	2
2,4,5-Trichlorophenol	ND		ug/kg	360	--	2

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	62		30-130
Phenol-d6	63		30-130
Nitrobenzene-d5	43		30-130
2-Fluorobiphenyl	65		30-130
2,4,6-Tribromophenol	53		30-130
4-Terphenyl-d14	59		30-130

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 11/18/15 22:31
Analyst: PS

Extraction Method: EPA 3546
Extraction Date: 11/17/15 22:59

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 03 Batch: WG841681-1					
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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 11/18/15 22:31
Analyst: PS

Extraction Method: EPA 3546
Extraction Date: 11/17/15 22:59

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 03 Batch: WG841681-1					
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	--
Pyridine	ND		ug/kg	650	--

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8270D
Analytical Date: 11/18/15 22:31
Analyst: PS

Extraction Method: EPA 3546
Extraction Date: 11/17/15 22:59

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 03 Batch: WG841681-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	62		30-130
Phenol-d6	61		30-130
Nitrobenzene-d5	55		30-130
2-Fluorobiphenyl	60		30-130
2,4,6-Tribromophenol	54		30-130
4-Terphenyl-d14	61		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529845

Project Number: 5863.9.01

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 03 Batch: WG841681-2 WG841681-3								
Acenaphthene	82		69		40-140	17		30
1,2,4-Trichlorobenzene	82		63		40-140	26		30
Hexachlorobenzene	81		71		40-140	13		30
Bis(2-chloroethyl)ether	81		62		40-140	27		30
2-Chloronaphthalene	88		72		40-140	20		30
1,2-Dichlorobenzene	78		56		40-140	33	Q	30
1,3-Dichlorobenzene	78		56		40-140	33	Q	30
1,4-Dichlorobenzene	77		55		40-140	33	Q	30
3,3'-Dichlorobenzidine	64		54		40-140	17		30
2,4-Dinitrotoluene	84		74		40-140	13		30
2,6-Dinitrotoluene	88		76		40-140	15		30
Azobenzene	80		69		40-140	15		30
Fluoranthene	84		72		40-140	15		30
4-Bromophenyl phenyl ether	84		73		40-140	14		30
Bis(2-chloroisopropyl)ether	70		56		40-140	22		30
Bis(2-chloroethoxy)methane	85		70		40-140	19		30
Hexachlorobutadiene	79		62		40-140	24		30
Hexachloroethane	76		56		40-140	30		30
Isophorone	88		74		40-140	17		30
Naphthalene	82		64		40-140	25		30
Nitrobenzene	79		62		40-140	24		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529845

Project Number: 5863.9.01

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 03 Batch: WG841681-2 WG841681-3								
Bis(2-Ethylhexyl)phthalate	91		80		40-140	13		30
Butyl benzyl phthalate	86		74		40-140	15		30
Di-n-butylphthalate	86		74		40-140	15		30
Di-n-octylphthalate	92		80		40-140	14		30
Diethyl phthalate	84		74		40-140	13		30
Dimethyl phthalate	82		72		40-140	13		30
Benzo(a)anthracene	84		71		40-140	17		30
Benzo(a)pyrene	86		73		40-140	16		30
Benzo(b)fluoranthene	82		74		40-140	10		30
Benzo(k)fluoranthene	85		68		40-140	22		30
Chrysene	88		74		40-140	17		30
Acenaphthylene	88		74		40-140	17		30
Anthracene	84		71		40-140	17		30
Benzo(ghi)perylene	82		70		40-140	16		30
Fluorene	83		71		40-140	16		30
Phenanthrene	83		70		40-140	17		30
Dibenzo(a,h)anthracene	84		71		40-140	17		30
Indeno(1,2,3-cd)Pyrene	84		71		40-140	17		30
Pyrene	80		70		40-140	13		30
Aniline	52		43		40-140	19		30
4-Chloroaniline	95		79		40-140	18		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529845

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 03 Batch: WG841681-2 WG841681-3								
Dibenzofuran	81		68		40-140	17		30
2-Methylnaphthalene	84		69		40-140	20		30
Acetophenone	99		80		40-140	21		30
2,4,6-Trichlorophenol	88		76		30-130	15		30
2-Chlorophenol	86		71		30-130	19		30
2,4-Dichlorophenol	84		71		30-130	17		30
2,4-Dimethylphenol	87		72		30-130	19		30
2-Nitrophenol	86		70		30-130	21		30
4-Nitrophenol	84		74		30-130	13		30
2,4-Dinitrophenol	15	Q	16	Q	30-130	6		30
Pentachlorophenol	65		61		30-130	6		30
Phenol	84		70		30-130	18		30
2-Methylphenol	84		70		30-130	18		30
3-Methylphenol/4-Methylphenol	92		78		30-130	16		30
2,4,5-Trichlorophenol	89		74		30-130	18		30
Pyridine	54		32		30-130	51	Q	30

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
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MCP Semivolatile Organics - Westborough Lab Associated sample(s): 03 Batch: WG841681-2 WG841681-3

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> <i>Criteria</i>
2-Fluorophenol	88		70		30-130
Phenol-d6	88		74		30-130
Nitrobenzene-d5	88		70		30-130
2-Fluorobiphenyl	85		72		30-130
2,4,6-Tribromophenol	88		75		30-130
4-Terphenyl-d14	79		68		30-130

PETROLEUM HYDROCARBONS

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-03 D
 Client ID: B-206 0-6 FILL
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil
 Analytical Method: 1,8015C(M)
 Analytical Date: 11/19/15 19:46
 Analyst: DG
 Percent Solids: 89%

Date Collected: 11/13/15 10:30
 Date Received: 11/13/15
 Field Prep: Not Specified
 Extraction Method: EPA 3546
 Extraction Date: 11/18/15 23:09

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Petroleum Hydrocarbon Quantitation - Westborough Lab						
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TPH	938000		ug/kg	358000	--	10
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Surrogate	% Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	69		40-140

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015C(M)
Analytical Date: 11/19/15 17:16
Analyst: DG

Extraction Method: EPA 3546
Extraction Date: 11/18/15 23:09

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 03 Batch: WG842131-1					
TPH	ND		ug/kg	33200	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	70		40-140

Lab Control Sample Analysis Batch Quality Control

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 03 Batch: WG842131-2								
TPH	88		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	76				40-140

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-01
 Client ID: B-207 S2 2-4
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil
 Analytical Method: 100, VPH-04-1.1
 Analytical Date: 11/17/15 23:18
 Analyst: KD
 Percent Solids: 84%

Date Collected: 11/11/15 14:50
 Date Received: 11/13/15
 Field Prep: Not Specified

Quality Control Information

Condition of sample received: Satisfactory
 Sample Temperature upon receipt: Received on Ice
 Were samples received in methanol? Yes (Covering the Soil)
 Methanol ratio: 1:1 +/- 25%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Petroleum Hydrocarbons - Westborough Lab						
C5-C8 Aliphatics	ND		mg/kg	3.28	--	1
C9-C12 Aliphatics	ND		mg/kg	3.28	--	1
C9-C10 Aromatics	ND		mg/kg	3.28	--	1
C5-C8 Aliphatics, Adjusted	ND		mg/kg	3.28	--	1
C9-C12 Aliphatics, Adjusted	ND		mg/kg	3.28	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	107		70-130
2,5-Dibromotoluene-FID	117		70-130

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-01
 Client ID: B-207 S2 2-4
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil
 Analytical Method: 98,EPH-04-1.1
 Analytical Date: 11/19/15 13:30
 Analyst: SR
 Percent Solids: 84%

Date Collected: 11/11/15 14:50
 Date Received: 11/13/15
 Field Prep: Not Specified
 Extraction Method: EPA 3546
 Extraction Date: 11/18/15 00:35
 Cleanup Method1: EPH-04-1
 Cleanup Date1: 11/18/15

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	7.50	--	1
C19-C36 Aliphatics	8.31		mg/kg	7.50	--	1
C11-C22 Aromatics	31.2		mg/kg	7.50	--	1
C11-C22 Aromatics, Adjusted	19.4		mg/kg	7.50	--	1
Naphthalene	ND		mg/kg	0.375	--	1
2-Methylnaphthalene	ND		mg/kg	0.375	--	1
Acenaphthylene	ND		mg/kg	0.375	--	1
Acenaphthene	ND		mg/kg	0.375	--	1
Fluorene	ND		mg/kg	0.375	--	1
Phenanthrene	1.56		mg/kg	0.375	--	1
Anthracene	0.386		mg/kg	0.375	--	1
Fluoranthene	2.04		mg/kg	0.375	--	1
Pyrene	2.04		mg/kg	0.375	--	1
Benzo(a)anthracene	0.964		mg/kg	0.375	--	1
Chrysene	1.09		mg/kg	0.375	--	1
Benzo(b)fluoranthene	0.735		mg/kg	0.375	--	1
Benzo(k)fluoranthene	0.804		mg/kg	0.375	--	1
Benzo(a)pyrene	1.03		mg/kg	0.375	--	1
Indeno(1,2,3-cd)Pyrene	0.562		mg/kg	0.375	--	1
Dibenzo(a,h)anthracene	ND		mg/kg	0.375	--	1
Benzo(ghi)perylene	0.574		mg/kg	0.375	--	1

Project Name: FIRST STREET PUD**Lab Number:** L1529845**Project Number:** 5863.9.01**Report Date:** 11/23/15**SAMPLE RESULTS**

Lab ID: L1529845-01

Date Collected: 11/11/15 14:50

Client ID: B-207 S2 2-4

Date Received: 11/13/15

Sample Location: CAMBRIDGE, MA

Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Extractable Petroleum Hydrocarbons - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	70		40-140
o-Terphenyl	79		40-140
2-Fluorobiphenyl	75		40-140
2-Bromonaphthalene	81		40-140

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 100,VPH-04-1.1
Analytical Date: 11/17/15 08:49
Analyst: KD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Petroleum Hydrocarbons - Westborough Lab for sample(s): 01 Batch: WG841488-3					
C5-C8 Aliphatics	ND		mg/kg	2.67	--
C9-C12 Aliphatics	ND		mg/kg	2.67	--
C9-C10 Aromatics	ND		mg/kg	2.67	--
C5-C8 Aliphatics, Adjusted	ND		mg/kg	2.67	--
C9-C12 Aliphatics, Adjusted	ND		mg/kg	2.67	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2,5-Dibromotoluene-PID	95		70-130
2,5-Dibromotoluene-FID	104		70-130

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 98,EPH-04-1.1
Analytical Date: 11/18/15 15:13
Analyst: SR

Extraction Method: EPA 3546
Extraction Date: 11/18/15 00:34
Cleanup Method: EPH-04-1
Cleanup Date: 11/18/15

Parameter	Result	Qualifier	Units	RL	MDL
Extractable Petroleum Hydrocarbons - Westborough Lab for sample(s): 01 Batch: WG841694-1					
C9-C18 Aliphatics	ND		mg/kg	6.45	--
C19-C36 Aliphatics	ND		mg/kg	6.45	--
C11-C22 Aromatics	ND		mg/kg	6.45	--
C11-C22 Aromatics, Adjusted	ND		mg/kg	6.45	--
Naphthalene	ND		mg/kg	0.322	--
2-Methylnaphthalene	ND		mg/kg	0.322	--
Acenaphthylene	ND		mg/kg	0.322	--
Acenaphthene	ND		mg/kg	0.322	--
Fluorene	ND		mg/kg	0.322	--
Phenanthrene	ND		mg/kg	0.322	--
Anthracene	ND		mg/kg	0.322	--
Fluoranthene	ND		mg/kg	0.322	--
Pyrene	ND		mg/kg	0.322	--
Benzo(a)anthracene	ND		mg/kg	0.322	--
Chrysene	ND		mg/kg	0.322	--
Benzo(b)fluoranthene	ND		mg/kg	0.322	--
Benzo(k)fluoranthene	ND		mg/kg	0.322	--
Benzo(a)pyrene	ND		mg/kg	0.322	--
Indeno(1,2,3-cd)Pyrene	ND		mg/kg	0.322	--
Dibenzo(a,h)anthracene	ND		mg/kg	0.322	--
Benzo(ghi)perylene	ND		mg/kg	0.322	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Chloro-Octadecane	64		40-140
o-Terphenyl	60		40-140
2-Fluorobiphenyl	68		40-140
2-Bromonaphthalene	68		40-140



Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529845

Project Number: 5863.9.01

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01 Batch: WG841488-1 WG841488-2								
C5-C8 Aliphatics	93		93		70-130	1		25
C9-C12 Aliphatics	113		112		70-130	1		25
C9-C10 Aromatics	99		100		70-130	1		25
Benzene	90		91		70-130	1		25
Toluene	92		94		70-130	1		25
Ethylbenzene	95		96		70-130	1		25
p/m-Xylene	99		99		70-130	0		25
o-Xylene	99		99		70-130	0		25
Methyl tert butyl ether	94		98		70-130	4		25
Naphthalene	94		96		70-130	2		25
1,2,4-Trimethylbenzene	99		100		70-130	1		25
Pentane	93		91		70-130	2		25
2-Methylpentane	93		92		70-130	1		25
2,2,4-Trimethylpentane	95		95		70-130	1		25
n-Nonane	110		109		30-130	1		25
n-Decane	108		107		70-130	1		25
n-Butylcyclohexane	121		120		70-130	1		25

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529845

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
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Volatile Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01 Batch: WG841488-1 WG841488-2

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2,5-Dibromotoluene-PID	97		94		70-130
2,5-Dibromotoluene-FID	106		103		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529845

Project Number: 5863.9.01

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01 Batch: WG841694-2 WG841694-3								
C9-C18 Aliphatics	59		51		40-140	15		25
C19-C36 Aliphatics	74		67		40-140	10		25
C11-C22 Aromatics	66		74		40-140	11		25
Naphthalene	53		54		40-140	2		25
2-Methylnaphthalene	57		60		40-140	5		25
Acenaphthylene	54		58		40-140	7		25
Acenaphthene	59		63		40-140	7		25
Fluorene	60		70		40-140	15		25
Phenanthrene	63		74		40-140	16		25
Anthracene	66		72		40-140	9		25
Fluoranthene	63		67		40-140	6		25
Pyrene	65		69		40-140	6		25
Benzo(a)anthracene	61		65		40-140	6		25
Chrysene	65		68		40-140	5		25
Benzo(b)fluoranthene	63		66		40-140	5		25
Benzo(k)fluoranthene	61		64		40-140	5		25
Benzo(a)pyrene	63		68		40-140	8		25
Indeno(1,2,3-cd)Pyrene	61		64		40-140	5		25
Dibenzo(a,h)anthracene	61		64		40-140	5		25
Benzo(ghi)perylene	63		67		40-140	6		25
Nonane (C9)	49		40		30-140	20		25

Lab Control Sample Analysis Batch Quality Control

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
Extractable Petroleum Hydrocarbons - Westborough Lab Associated sample(s): 01 Batch: WG841694-2 WG841694-3								
Decane (C10)	56		48		40-140	15		25
Dodecane (C12)	59		52		40-140	13		25
Tetradecane (C14)	61		54		40-140	12		25
Hexadecane (C16)	64		58		40-140	10		25
Octadecane (C18)	68		60		40-140	13		25
Nonadecane (C19)	69		61		40-140	12		25
Eicosane (C20)	70		61		40-140	14		25
Docosane (C22)	68		60		40-140	13		25
Tetracosane (C24)	68		61		40-140	11		25
Hexacosane (C26)	68		62		40-140	9		25
Octacosane (C28)	70		64		40-140	9		25
Triacontane (C30)	70		65		40-140	7		25
Hexatriacontane (C36)	78		72		40-140	8		25

Surrogate	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Chloro-Octadecane	59		46		40-140
o-Terphenyl	61		65		40-140
2-Fluorobiphenyl	69		72		40-140
2-Bromonaphthalene	71		73		40-140
% Naphthalene Breakthrough	0		0		
% 2-Methylnaphthalene Breakthrough	0		0		



PCBS

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-03
Client ID: B-206 0-6 FILL
Sample Location: CAMBRIDGE, MA
Matrix: Soil
Analytical Method: 97,8082A
Analytical Date: 11/19/15 23:39
Analyst: JT
Percent Solids: 89%

Date Collected: 11/13/15 10:30
Date Received: 11/13/15
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 11/18/15 21:42
Cleanup Method: EPA 3665A
Cleanup Date: 11/19/15
Cleanup Method: EPA 3660B
Cleanup Date: 11/19/15

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	35.6	--	1	A
Aroclor 1221	ND		ug/kg	35.6	--	1	A
Aroclor 1232	ND		ug/kg	35.6	--	1	A
Aroclor 1242	ND		ug/kg	35.6	--	1	A
Aroclor 1248	ND		ug/kg	35.6	--	1	A
Aroclor 1254	ND		ug/kg	35.6	--	1	A
Aroclor 1260	ND		ug/kg	35.6	--	1	A
Aroclor 1262	ND		ug/kg	35.6	--	1	A
Aroclor 1268	ND		ug/kg	35.6	--	1	A
PCBs, Total	ND		ug/kg	35.6	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	59		30-150	A
Decachlorobiphenyl	64		30-150	A
2,4,5,6-Tetrachloro-m-xylene	61		30-150	B
Decachlorobiphenyl	74		30-150	B

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Analytical Method: 97,8082A
 Analytical Date: 11/20/15 00:44
 Analyst: JT

Extraction Method: EPA 3546
 Extraction Date: 11/18/15 21:42
 Cleanup Method: EPA 3665A
 Cleanup Date: 11/19/15
 Cleanup Method: EPA 3660B
 Cleanup Date: 11/19/15

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 03 Batch: WG842121-1						
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	82		30-150	A
Decachlorobiphenyl	77		30-150	A
2,4,5,6-Tetrachloro-m-xylene	83		30-150	B
Decachlorobiphenyl	79		30-150	B



Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1529845

Project Number: 5863.9.01

Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 03 Batch: WG842121-2 WG842121-3									
Aroclor 1016	78		78		40-140	0		30	A
Aroclor 1260	77		80		40-140	4		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	90		90		30-150	A
Decachlorobiphenyl	86		89		30-150	A
2,4,5,6-Tetrachloro-m-xylene	98		95		30-150	B
Decachlorobiphenyl	94		91		30-150	B

METALS

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-03
 Client ID: B-206 0-6 FILL
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil
 Percent Solids: 89%

Date Collected: 11/13/15 10:30
 Date Received: 11/13/15
 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	5.8		mg/kg	0.45	--	1	11/14/15 05:38	11/16/15 15:33	EPA 3050B	97,6010C	PS
Barium, Total	55		mg/kg	0.45	--	1	11/14/15 05:38	11/16/15 15:33	EPA 3050B	97,6010C	PS
Cadmium, Total	ND		mg/kg	0.45	--	1	11/14/15 05:38	11/16/15 15:33	EPA 3050B	97,6010C	PS
Chromium, Total	9.3		mg/kg	0.45	--	1	11/14/15 05:38	11/16/15 15:33	EPA 3050B	97,6010C	PS
Lead, Total	310		mg/kg	2.2	--	1	11/14/15 05:38	11/16/15 15:33	EPA 3050B	97,6010C	PS
Mercury, Total	1.03		mg/kg	0.071	--	1	11/14/15 10:45	11/16/15 20:12	EPA 7471B	97,7471B	EA
Selenium, Total	ND		mg/kg	2.2	--	1	11/14/15 05:38	11/16/15 15:33	EPA 3050B	97,6010C	PS
Silver, Total	ND		mg/kg	0.45	--	1	11/14/15 05:38	11/16/15 15:33	EPA 3050B	97,6010C	PS



Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

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): 03 Batch: WG840670-1									
Mercury, Total	ND	mg/kg	0.083	--	1	11/14/15 10:45	11/16/15 19:35	97,7471B	EA

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): 03 Batch: WG840688-1									
Arsenic, Total	ND	mg/kg	0.40	--	1	11/14/15 05:38	11/16/15 14:26	97,6010C	PS
Barium, Total	ND	mg/kg	0.40	--	1	11/14/15 05:38	11/16/15 14:26	97,6010C	PS
Cadmium, Total	ND	mg/kg	0.40	--	1	11/14/15 05:38	11/16/15 14:26	97,6010C	PS
Chromium, Total	ND	mg/kg	0.40	--	1	11/14/15 05:38	11/16/15 14:26	97,6010C	PS
Lead, Total	ND	mg/kg	2.0	--	1	11/14/15 05:38	11/16/15 14:26	97,6010C	PS
Selenium, Total	ND	mg/kg	2.0	--	1	11/14/15 05:38	11/16/15 14:26	97,6010C	PS
Silver, Total	ND	mg/kg	0.40	--	1	11/14/15 05:38	11/16/15 14:26	97,6010C	PS

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
MCP Total Metals - Westborough Lab Associated sample(s): 03 Batch: WG840670-2 WG840670-3 SRM Lot Number: D088-540								
Mercury, Total	85		96		72-128	12		30
MCP Total Metals - Westborough Lab Associated sample(s): 03 Batch: WG840688-2 WG840688-3 SRM Lot Number: D088-540								
Arsenic, Total	105		105		79-121	0		30
Barium, Total	88		88		83-117	0		30
Cadmium, Total	95		95		83-117	0		30
Chromium, Total	92		92		80-120	0		30
Lead, Total	83		87		81-117	5		30
Selenium, Total	97		102		78-122	5		30
Silver, Total	96		98		75-124	2		30



INORGANICS & MISCELLANEOUS

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-03
Client ID: B-206 0-6 FILL
Sample Location: CAMBRIDGE, MA
Matrix: Soil

Date Collected: 11/13/15 10:30
Date Received: 11/13/15
Field Prep: Not Specified

Test Material Information

Source of Material: Unknown
Description of Material: Non-Metallic - Damp Soil
Particle Size: Medium
Preliminary Burning Time (sec): 120

Parameter	Result	Date Analyzed	Analytical Method	Analyst
Ignitability of Solids - Westborough Lab				
Ignitability	NI	11/17/15 10:29	1,1030	AB



Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529845

Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-01
 Client ID: B-207 S2 2-4
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil

Date Collected: 11/11/15 14:50
 Date Received: 11/13/15
 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	83.5		%	0.100	NA	1	-	11/16/15 22:29	30,2540G	RT



Project Name: FIRST STREET PUD

Lab Number: L1529845

Project Number: 5863.9.01

Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-02
 Client ID: B-206 S1 0-2
 Sample Location: CAMBRIDGE, MA
 Matrix: Soil

Date Collected: 11/13/15 10:30
 Date Received: 11/13/15
 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	88.6		%	0.100	NA	1	-	11/16/15 22:29	30,2540G	RT



Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

SAMPLE RESULTS

Lab ID: L1529845-03
Client ID: B-206 0-6 FILL
Sample Location: CAMBRIDGE, MA
Matrix: Soil

Date Collected: 11/13/15 10:30
Date Received: 11/13/15
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance	120		umhos/cm	10	--	1	-	11/16/15 19:48	1,9050A	KZ
Solids, Total	88.6		%	0.100	NA	1	-	11/16/15 22:29	30,2540G	RT
pH (H)	8.3		SU	-	NA	1	-	11/14/15 00:22	1,9045D	AS
Cyanide, Reactive	ND		mg/kg	10	--	1	11/16/15 16:10	11/16/15 18:34	1,7.3	TL
Sulfide, Reactive	ND		mg/kg	10	--	1	11/16/15 16:10	11/16/15 18:42	1,7.3	TL



Project Name: FIRST STREET PUD

Lab Number: L1529845

Project Number: 5863.9.01

Report Date: 11/23/15

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 03 Batch: WG841119-1										
Cyanide, Reactive	ND		mg/kg	10	--	1	11/16/15 16:10	11/16/15 18:30	1,7.3	TL
General Chemistry - Westborough Lab for sample(s): 03 Batch: WG841123-1										
Sulfide, Reactive	ND		mg/kg	10	--	1	11/16/15 16:10	11/16/15 18:38	1,7.3	TL

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 03 Batch: WG840637-1								
pH	100		-		99-101	-		
General Chemistry - Westborough Lab Associated sample(s): 03 Batch: WG841119-2								
Cyanide, Reactive	32		-		30-125	-		40
General Chemistry - Westborough Lab Associated sample(s): 03 Batch: WG841123-2								
Sulfide, Reactive	85		-		60-125	-		40
General Chemistry - Westborough Lab Associated sample(s): 03 Batch: WG841225-1								
Specific Conductance	97		-		80-120	-		



Lab Duplicate Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529845

Report Date: 11/23/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 03 QC Batch ID: WG841225-2 QC Sample: L1529845-03 Client ID: B-206 0-6 FILL						
Specific Conductance	120	110	umhos/cm	9		20

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529845

Report Date: 11/23/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Reagent H2O Preserved Vials Frozen on: 11/13/2015 21:56

Cooler Information Custody Seal

Cooler

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1529845-01A	Vial MeOH preserved	A	N/A	3.9	Y	Absent	VPH-10(28)
L1529845-01B	Glass 250ml/8oz unpreserved	A	N/A	3.9	Y	Absent	TS(7),EPH-DELUX-10(14)
L1529845-02A	Vial MeOH preserved	A	N/A	3.9	Y	Absent	MCP-8260HLW-10(14)
L1529845-02B	Vial water preserved	A	N/A	3.9	Y	Absent	MCP-8260HLW-10(14)
L1529845-02C	Vial water preserved	A	N/A	3.9	Y	Absent	MCP-8260HLW-10(14)
L1529845-03A	Glass 500ml/16oz unpreserved	A	N/A	3.9	Y	Absent	IGNIT-1030(14),MCP-8082-10(365),MCP-CR-6010T-10(180),REACTS(14),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),PH-9045(1),MCP(),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),REACTCN(14),TPH-DRO-D(14),COND-9050(28),MCP-PB-6010T-10(180)

*Values in parentheses indicate holding time in days



Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

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.
LCS D	- 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.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
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.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

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).

Report Format: Data Usability Report



Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529845
Report Date: 11/23/15

Data Qualifiers

- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The 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.

Project Name: FIRST STREET PUD**Lab Number:** L1529845**Project Number:** 5863.9.01**Report Date:** 11/23/15

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.
- 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.
- 100 Method for the Determination of Volatile Petroleum Hydrocarbons (VPH), MassDEP, May 2004, Revision 1.1 with QC Requirements & Performance Standards for the Analysis of VPH under the Massachusetts Contingency Plan, WSC-CAM-IVA, 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

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

Westborough Facility

EPA 8260C: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene; Iodomethane (methyl iodide) (soil); Methyl methacrylate (soil); Azobenzene.

EPA 8270D: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 625: 4-Chloroaniline, 4-Methylphenol.

SM4500: Soil: Total Phosphorus, TKN, NO₂, NO₃.

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, SM4500CI-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.

7A

Volatile Organics CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1529845

Instrument ID: Voall1.i Calibration Date: 20-NOV-2015 Time: 08:43

Lab File ID: 1120A01 Init. Calib. Date(s): 01-OCT-2 18-NOV-2

Sample No: 8260 CCAL Init. Calib. Times : 00:31 18:24

Compound	RRF	RRF	MIN RRF	%D	MAX %D	
dichlorodifluoromethane	.2303	.16236	.1	-29	20	F
chloromethane	.38679	.40038	.1	4	20	
vinyl chloride	.18063	.12471	.1	-31	20	F
bromomethane	.09245	.05783	.1	-37	20	F
chloroethane	.10731	.07505	.1	-30	20	F
trichlorofluoromethane	.36132	.23103	.1	-36	20	F
ethyl ether	.19493	.20777	.05	7	20	
1,1,-dichloroethene	.23109	.21537	.1	-7	20	
carbon disulfide	100	110	.1	10	20	
methylene chloride	.32368	.33276	.1	3	20	
acetone	.0895	.09092	.1	2	20	F
trans-1,2-dichloroethene	.26802	.25883	.1	-3	20	
methyl tert butyl ether	.91393	.81669	.1	-11	20	
Diisopropyl Ether	1.3423	1.4944	.05	11	20	
1,1-dichloroethane	.63256	.66364	.2	5	20	
Ethyl-Tert-Butyl-Ether	1.2381	1.2217	.05	-1	20	
cis-1,2-dichloroethene	.30432	.30221	.1	-1	20	
2,2-dichloropropane	.4499	.33703	.05	-25	20	F
bromochloromethane	.10512	.10089	.05	-4	20	
chloroform	.53697	.46277	.2	-14	20	
carbontetrachloride	.29482	.19043	.1	-35	20	F
tetrahydrofuran	.12027	.15464	.05	29	20	F
1,1,1-trichloroethane	.40826	.28989	.1	-29	20	F
2-butanone	.15406	.16459	.1	7	20	
1,1-dichloropropene	.35837	.35233	.05	-2	20	
benzene	1.1177	1.2372	.5	11	20	
Tertiary-Amyl Methyl Ether	.86328	.83631	.05	-3	20	
1,2-dichloroethane	.5086	.42251	.1	-17	20	
trichloroethene	.26093	.25014	.2	-4	20	
dibromomethane	.17018	.15637	.05	-8	20	
1,2-dichloropropane	.34621	.3993	.1	15	20	
bromodichloromethane	.42328	.34803	.2	-18	20	
1,4-dioxane	.00278	.00301	.05	8	20	F
cis-1,3-dichloropropene	.50341	.49702	.2	-1	20	
toluene	1.0010	1.0241	.4	2	20	
4-methyl-2-pentanone	.12898	.1357	.1	5	20	
tetrachloroethene	.28322	.25317	.2	-11	20	
trans-1,3-dichloropropene	.6773	.60697	.1	-10	20	

FORM VII MCP-8260HLW-10

7A
CONTINUING CALIBRATION CHECK

Lab Name: Alpha Analytical Labs

SDG No.: L1529845

Instrument ID: Voal11.i Calibration Date: 20-NOV-2015 Time: 08:43

Lab File ID: 1120A01 Init. Calib. Date(s): 01-OCT-2 18-NOV-2

Sample No: 8260 CCAL Init. Calib. Times : 00:31 18:24

Compound	RRF	RRF	MIN RRF	%D	MAX %D
1,1,2-trichloroethane	.29517	.32728	.1	11	20
chlorodibromomethane	.32245	.24231	.1	-25	20
1,3-dichloropropane	.65692	.69484	.05	6	20
1,2-dibromoethane	.33488	.3026	.1	-10	20
2-hexanone	.34124	.3556	.1	4	20
chlorobenzene	.97873	.95934	.5	-2	20
ethyl benzene	1.7924	1.7581	.1	-2	20
1,1,1,2-tetrachloroethane	.29522	.23385	.05	-21	20
p/m xylene	.61046	.63317	.1	4	20
o xylene	.60097	.61689	.3	3	20
styrene	.98492	1.0226	.3	4	20
bromoform	.41596	.33782	.1	-19	20
isopropylbenzene	3.4929	3.4600	.1	-1	20
bromobenzene	.79553	.76639	.05	-4	20
n-propylbenzene	4.3338	4.7412	.05	9	20
1,1,2,2,-tetrachloroethane	.98758	1.1359	.3	15	20
2-chlorotoluene	3.3457	3.2961	.05	-1	20
1,3,5-trimethylbenzene	2.9511	2.8824	.05	-2	20
1,2,3-trichloropropane	.7979	.85162	.05	7	20
4-chlorotoluene	3.1408	3.0461	.05	-3	20
tert-butylbenzene	2.1506	2.0482	.05	-5	20
1,2,4-trimethylbenzene	3.0670	2.9722	.05	-3	20
sec-butylbenzene	3.5861	3.8063	.05	6	20
p-isopropyltoluene	2.7046	2.6524	.05	-2	20
1,3-dichlorobenzene	1.4289	1.4259	.6	0	20
1,4-dichlorobenzene	1.4237	1.4173	.5	0	20
n-butylbenzene	3.0328	3.3359	.05	10	20
1,2-dichlorobenzene	1.3592	1.3568	.4	0	20
1,2-dibromo-3-chloropropane	.11511	.0942	.05	-18	20
hexachlorobutadiene	.40946	.36192	.05	-12	20
1,2,4-trichlorobenzene	.92687	.95563	.2	3	20
naphthalene	2.2231	2.2316	.05	0	20
1,2,3-trichlorobenzene	.92616	.93087	.05	1	20
dibromofluoromethane	.22827	.19645	.05	-14	30
1,2-dichloroethane-d4	.33391	.27086	.05	-19	30
toluene-d8	1.4068	1.4143	.05	1	30
4-bromofluorobenzene	1.4018	1.3057	.05	-7	30

FORM VII MCP-8260HLW-10



ANALYTICAL REPORT

Lab Number:	L1529948
Client:	McPhail Associates 2269 Massachusetts Avenue Cambridge, MA 02140
ATTN:	Ambrose Donovan
Phone:	(617) 868-1420
Project Name:	FIRST STREET PUD
Project Number:	5863.9.01
Report Date:	11/24/15

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

Certifications & Approvals: MA (M-MA086), NY (11148), CT (PH-0574), NH (2003), NJ NELAP (MA935), RI (LAO00065), ME (MA00086), PA (68-03671), 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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529948
Report Date: 11/24/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1529948-01	B-203 7-12' FILL	SOIL	CAMBRIDGE, MA	11/11/15 08:00	11/11/15
L1529948-02	B-207 0-6 FILL	SOIL	CAMBRIDGE, MA	11/11/15 14:50	11/11/15

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529948
Report Date: 11/24/15

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).	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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529948
Report Date: 11/24/15

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. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. 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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529948
Report Date: 11/24/15

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:



Lisa Westerlind

Title: Technical Director/Representative

Date: 11/24/15

METALS

Project Name: FIRST STREET PUD**Lab Number:** L1529948**Project Number:** 5863.9.01**Report Date:** 11/24/15**SAMPLE RESULTS**

Lab ID: L1529948-02

Date Collected: 11/11/15 14:50

Client ID: B-207 0-6 FILL

Date Received: 11/11/15

Sample Location: CAMBRIDGE, MA

Field Prep: Not Specified

Matrix: Soil

TCLP/SPLP Ext. Date: 11/21/15 19:26

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	11/24/15 04:45	11/24/15 11:27	EPA 3015	1,6010C	JH



Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529948
Report Date: 11/24/15

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: WG843750-1									
Lead, TCLP	ND	mg/l	0.50	--	1	11/24/15 04:12	11/24/15 10:12	1,6010C	JH

Prep Information

Digestion Method: EPA 3015
TCLP/SPLP Extraction Date: 11/21/15 19:26

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): 02 Batch: WG843754-1									
Lead, TCLP	ND	mg/l	0.50	--	1	11/24/15 04:45	11/24/15 11:00	1,6010C	JH

Prep Information

Digestion Method: EPA 3015
TCLP/SPLP Extraction Date: 11/21/15 19:26

Lab Control Sample Analysis

Batch Quality Control

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529948

Report Date: 11/24/15

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: WG843750-2								
Lead, TCLP	98		-		75-125	-		20
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 02 Batch: WG843754-2								
Lead, TCLP	98		-		75-125	-		20

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1529948

Report Date: 11/24/15

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information Custody Seal**Cooler**

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1529948-01A	Glass 500ml/16oz unpreserved	A	N/A	3.5	Y	Absent	-
L1529948-01X	Plastic 120ml HNO3 preserved spl	A	<2	3.5	Y	Absent	PB-CI(180)
L1529948-01X9	Tumble Vessel	A	N/A	3.5	Y	Absent	-
L1529948-02A	Glass 500ml/16oz unpreserved	A	N/A	3.5	Y	Absent	-
L1529948-02X	Plastic 120ml HNO3 preserved spl	A	<2	3.5	Y	Absent	PB-CI(180)
L1529948-02X9	Tumble Vessel	A	N/A	3.5	Y	Absent	-

*Values in parentheses indicate holding time in days

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529948
Report Date: 11/24/15

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.
LCS D	- 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.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
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.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

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).

Report Format: Data Usability Report



Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529948
Report Date: 11/24/15

Data Qualifiers

- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The 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.

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1529948
Report Date: 11/24/15

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

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

Westborough Facility

EPA 8260C: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene; Iodomethane (methyl iodide) (soil); Methyl methacrylate (soil); Azobenzene.

EPA 8270D: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 625: 4-Chloroaniline, 4-Methylphenol.

SM4500: Soil: Total Phosphorus, TKN, NO₂, NO₃.

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, SM4500CI-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.

L1529948 LT 11/18/15



CHAIN OF CUSTODY

PAGE 1 OF 2

Project Information

Project Name: First Street PUD

Project Location: Cambridge, MA

Project #: 5863.9.01

Project Manager: Scott Smith

ALPHA Quote #:

Turn-Around Time

Standard Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Westborough, MA Mansfield, MA
 TEL: 508-898-9220 TEL: 508-822-9300
 FAX: 508-898-9193 FAX: 508-822-3288

Client Information

Client: McPhail Associates, LLC
 Address: 2269 Massachusetts Avenue
 Cambridge, MA 02140
 Phone: 617-868-1420
 Fax: 617-868-1423
 Email: ssmith@mcphailgeo.com

These samples have been Previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:
 Run TCLP if greater than 20x rule

Date Rec'd in Lab: 11/11/15

ALPHA Job #: ~~L1529948~~

Report Information Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed Program: MA MCP
 Criteria: RCS-1

ANALYSIS

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	Soil Mgmt Package IV - w/o VOC	VOC 8260 Low	VOC 8260 High (if low-out-of-range)	Pesticides	Total Solids	MGP-14 Metals	EPH Deluxe	VPH Deluxe	TCLP-PB	Sample Specific Comments	TOTAL # BOTTLES
29948 -01	B-203 7-12' F4	11/11/15	800	S	TMC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		1
-02	B-203 S6 11-12		800			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		3
-03	G-1 S11 18-20		1000		MGS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		3
-04	B-205 S1 0.5-2		1245		TMC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		4
-05	B-204 S4 6-8		1400		TMC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		4
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
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ANALYTICAL REPORT

Lab Number:	L1531278
Client:	McPhail Associates 2269 Massachusetts Avenue Cambridge, MA 02140
ATTN:	Ambrose Donovan
Phone:	(617) 868-1420
Project Name:	FIRST STREET PUD
Project Number:	5863.9.01
Report Date:	12/04/15

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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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1531278
Report Date: 12/04/15

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1531278-01	B-206 0-6 FILL	SOIL	CAMBRIDGE, MA	11/13/15 10:30	11/13/15

Project Name: FIRST STREET PUD

Lab Number: L1531278

Project Number: 5863.9.01

Report Date: 12/04/15

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).	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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1531278
Report Date: 12/04/15

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. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. 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: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1531278
Report Date: 12/04/15

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: 12/04/15

METALS

Project Name: FIRST STREET PUD**Lab Number:** L1531278**Project Number:** 5863.9.01**Report Date:** 12/04/15**SAMPLE RESULTS**

Lab ID: L1531278-01

Date Collected: 11/13/15 10:30

Client ID: B-206 0-6 FILL

Date Received: 11/13/15

Sample Location: CAMBRIDGE, MA

Field Prep: Not Specified

Matrix: Soil

TCLP/SPLP Ext. Date: 12/01/15 17:44

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	1.5		mg/l	0.50	--	1	12/02/15 19:18	12/03/15 15:43	EPA 3015	1,6010C	JH



Project Name: FIRST STREET PUD

Lab Number: L1531278

Project Number: 5863.9.01

Report Date: 12/04/15

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: WG846097-1									
Lead, TCLP	ND	mg/l	0.50	--	1	12/02/15 19:18	12/03/15 15:17	1,6010C	JH

Prep Information

Digestion Method: EPA 3015

TCLP/SPLP Extraction Date: 12/01/15 17:44

Lab Control Sample Analysis Batch Quality Control

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1531278
Report Date: 12/04/15

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: WG846097-2								
Lead, TCLP	100		-		75-125	-		20

Matrix Spike Analysis
Batch Quality Control

Project Name: FIRST STREET PUD

Lab Number: L1531278

Project Number: 5863.9.01

Report Date: 12/04/15

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Qual	MSD Found	MSD %Recovery	MSD Qual	Recovery Limits	RPD	RPD Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG846097-4 QC Sample: L1531278-01 Client ID: B-206 0-6 FILL												
Lead, TCLP	1.5	5.1	6.5	98		-	-		75-125	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: FIRST STREET PUD

Project Number: 5863.9.01

Lab Number: L1531278

Report Date: 12/04/15

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
TCLP Metals by EPA 1311 - Westborough Lab Associated sample(s): 01 QC Batch ID: WG846097-3 QC Sample: L1531278-01 Client ID: B-206 0-6 FILL						
Lead, TCLP	1.5	1.5	mg/l	0		20



Project Name: FIRST STREET PUD**Project Number:** 5863.9.01**Lab Number:** L1531278**Report Date:** 12/04/15**Sample Receipt and Container Information**

Were project specific reporting limits specified? YES

Cooler Information Custody Seal**Cooler**

A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1531278-01A	Glass 500ml/16oz unpreserved	A	N/A	3.9	Y	Absent	-
L1531278-01X	Plastic 120ml HNO3 preserved spl	A	<2	3.9	Y	Absent	PB-CI(180)
L1531278-01X9	Tumble Vessel	A	N/A	3.9	Y	Absent	-

*Values in parentheses indicate holding time in days

Project Name: FIRST STREET PUD
Project Number: 5863.9.01

Lab Number: L1531278
Report Date: 12/04/15

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.
LCS D	- 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.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
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.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

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).

Report Format: Data Usability Report



Project Name: FIRST STREET PUD
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Data Qualifiers

- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The 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.

Project Name: FIRST STREET PUD
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Report Date: 12/04/15

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

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

Westborough Facility

EPA 8260C: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene; Iodomethane (methyl iodide) (soil); Methyl methacrylate (soil); Azobenzene.

EPA 8270D: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

EPA 625: 4-Chloroaniline, 4-Methylphenol.

SM4500: Soil: Total Phosphorus, TKN, NO₂, NO₃.

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, SM4500CI-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

Project Information

Project Name: First Street PUD

Project Location: Cambridge, MA

Project #: 5863.9.01

Project Manager: Scott Smith

ALPHA Quote #:

Turn-Around Time

Standard Rush (ONLY IF PRE-APPROVED)

Due Date: Time:

Westborough, MA Mansfield, MA
 TEL: 508-898-9220 TEL: 508-822-9300
 FAX: 508-898-9193 FAX: 508-822-3288

Client Information

Client: McPhail Associates, LLC
 Address: 2269 Massachusetts Avenue
 Cambridge, MA 02140

Phone: 617-868-1420

Fax: 617-868-1423

Email: ssmith@mcphailgeo.com

These samples have been Previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

Run TCLP if greater than 20x rule

Date Rec'd in Lab: 11/13/15

ALPHA Job #: 21529845

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

RCS-1

ANALYSIS

Soil Mgmt Package IV w/o VOC	VOC 9260 Low	VOC 8260 High (if low out of range)	Pesticides	Total Solids	MCP-14 Metals	EPH Deluxe	VPH Deluxe	VPH	TCLP-PB	Sample Specific Comments	TOTAL # BOTTLES
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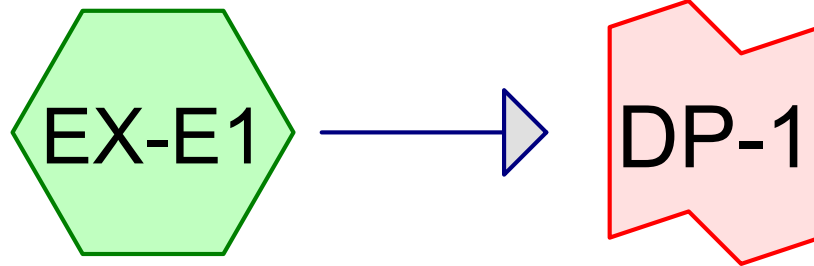
APPENDIX F
RAINFALL DATA

Table 1. Rainfall Data Change based on 2070 Projected Event

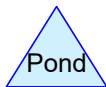
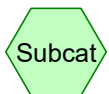
	2 year (in)	10 year (in)	25 year (in)	100 year (in)
TP-40		4.70		6.80
Cambridge Present (Current Cornell)	3.25	4.90	6.21	8.90
Cambridge 2030	3.34	5.60	7.25	10.20
Cambridge 2070	3.65	6.40	8.22	11.70

4. Store the difference between the 2-year 24-hour pre-construction runoff hydrograph from the site and the post construction 25-year 24-hour runoff hydrograph from the site utilizing the City’s projected rainfall data for the 2070 storm event as shown in Table 1. As a general rule, for properties discharging into the City of Cambridge municipal drainage system the City will provide a drainage level of service capacity to accept and transport up to the 2-year storm event. The stormwater runoff detention requirement states that the total volume of runoff generated between the pre-development 2-year 24-hour storm peak discharge and the post development 25-year 24-hour storm peak discharge shall be retained. Figure 3-1 illustrates this requirement with hypothetical stormwater runoff plots. The shaded area (the area between the peak 2-year runoff and the 25-year runoff) represents the quantity of stormwater retention required for achieving compliance with the City’s stormwater quantity control rule.

APPENDIX G
PRE-DEVELOPMENT DRAINAGE MAP AND HYDROCAD REPORT



Municipal System



85 First Street_Existing Hydrology_Parcel E

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Page 2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
2,450	98	Paved parking, HSG B (EX-E1)
7,300	98	Roofs, HSG B (EX-E1)
9,750	98	TOTAL AREA

85 First Street_Existing Hydrology_Parcel E

Prepared by Bohler

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Page 3

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
9,750	HSG B	EX-E1
0	HSG C	
0	HSG D	
0	Other	
9,750		TOTAL AREA

85 First Street_Existing Hydrology_Parcel E

Prepared by Bohler

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Page 4

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchmen Numbers
0	2,450	0	0	0	2,450	Paved parking	
0	7,300	0	0	0	7,300	Roofs	
0	9,750	0	0	0	9,750	TOTAL AREA	

Summary for Subcatchment EX-E1:

Runoff = 0.74 cfs @ 12.13 hrs, Volume= 2,776 cf, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 2 yr (2070) Rainfall=3.65"

Area (sf)	CN	Description
7,300	98	Roofs, HSG B
2,450	98	Paved parking, HSG B
9,750	98	Weighted Average
9,750		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Direct Entry

Summary for Link DP-1: Municipal System

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 3.42" for 2 yr (2070) event

Inflow = 0.74 cfs @ 12.13 hrs, Volume= 2,776 cf

Primary = 0.74 cfs @ 12.13 hrs, Volume= 2,776 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment EX-E1:

Runoff = 1.30 cfs @ 12.13 hrs, Volume= 5,006 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 10 yr (2070) Rainfall=6.40"

Area (sf)	CN	Description
7,300	98	Roofs, HSG B
2,450	98	Paved parking, HSG B
9,750	98	Weighted Average
9,750		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Direct Entry

Summary for Link DP-1: Municipal System

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 6.16" for 10 yr (2070) event

Inflow = 1.30 cfs @ 12.13 hrs, Volume= 5,006 cf

Primary = 1.30 cfs @ 12.13 hrs, Volume= 5,006 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment EX-E1:

Runoff = 1.67 cfs @ 12.13 hrs, Volume= 6,484 cf, Depth= 7.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 25 yr (2070) Rainfall=8.22"

Area (sf)	CN	Description
7,300	98	Roofs, HSG B
2,450	98	Paved parking, HSG B
9,750	98	Weighted Average
9,750		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Direct Entry

Summary for Link DP-1: Municipal System

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 7.98" for 25 yr (2070) event

Inflow = 1.67 cfs @ 12.13 hrs, Volume= 6,484 cf

Primary = 1.67 cfs @ 12.13 hrs, Volume= 6,484 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment EX-E1:

Runoff = 2.38 cfs @ 12.13 hrs, Volume= 9,310 cf, Depth=11.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 100 yr (2070) Rainfall=11.70"

Area (sf)	CN	Description
7,300	98	Roofs, HSG B
2,450	98	Paved parking, HSG B
9,750	98	Weighted Average
9,750		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Direct Entry

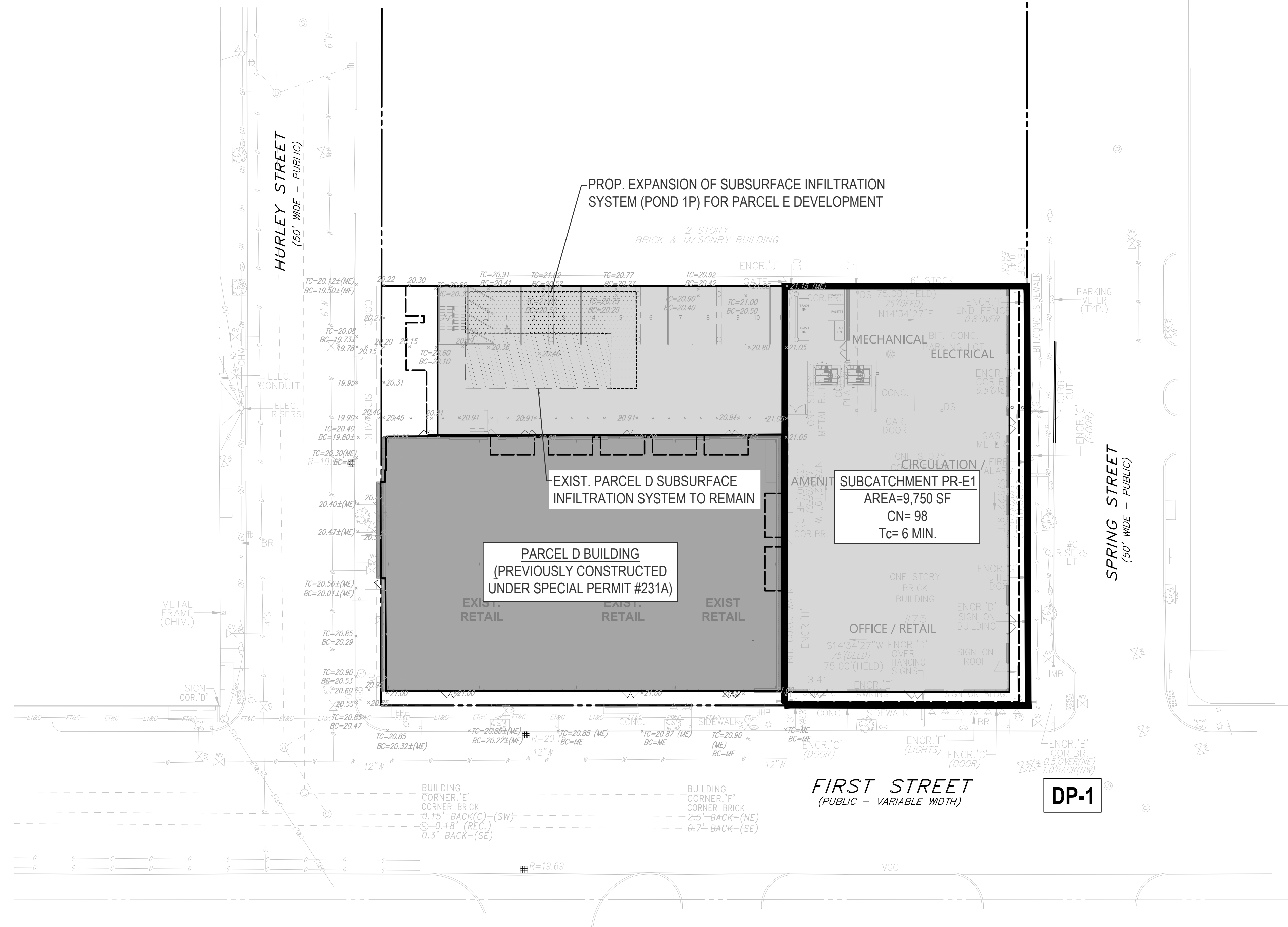
Summary for Link DP-1: Municipal System

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 11.46" for 100 yr (2070) event
 Inflow = 2.38 cfs @ 12.13 hrs, Volume= 9,310 cf
 Primary = 2.38 cfs @ 12.13 hrs, Volume= 9,310 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

APPENDIX H

POST-DEVELOPMENT DRAINAGE MAP, HYDROCAD REPORT, AND CALCULATIONS



REVISIONS

REV	DATE	COMMENT	DRAWN BY	CHECKED BY



ISSUED FOR MUNICIPAL & AGENCY REVIEW & APPROVAL

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.: MAB220072
 DRAWN BY: BEJRM
 CHECKED BY: MMW
 DATE: 07/13/2022
 CAD ID: MAB220072-X-TTB

PROPOSED SITE PLAN DOCUMENTS

FOR
US PARCEL E, LLC
 PROPOSED MIXED-USE DEVELOPMENT
 MAP: 10 & 18, LOT: 64 & 65
 75 & 85 FIRST STREET,
 CITY OF CAMBRIDGE,
 MIDDLESEX COUNTY,
 MASSACHUSETTS

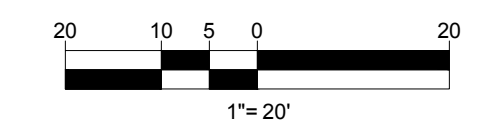
BOHLER
 45 FRANKLIN STREET, 5th FLOOR
 BOSTON, MA 02110
 Phone: (617) 849-8040
www.BohlerEngineering.com

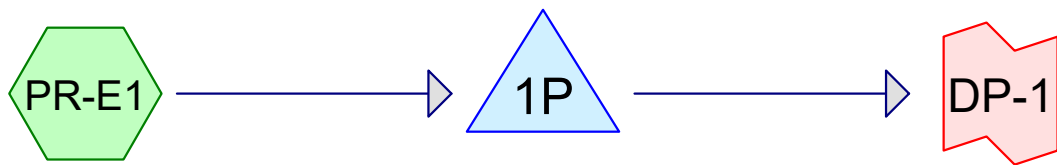
M.M. WIXTED
 PROFESSIONAL ENGINEER
 MASSACHUSETTS LICENSE No. 41706

SHEET TITLE:
PROPOSED CONDITIONS WATERSHED MAP

SHEET NUMBER:
WS-PR

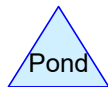
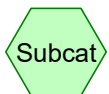
ORG. DATE - 07/13/2022





Additional Chambers

Municipal System



Routing Diagram for 85 First Street_Proposed Hydrology_Parcel B

Prepared by Bohler, Printed 7/22/2022

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85 First Street_Proposed Hydrology_Parcel E

Prepared by Bohler

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Printed 7/22/2022

Page 2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
9,750	98	Roofs, HSG B (PR-E1)
9,750	98	TOTAL AREA

85 First Street_Proposed Hydrology_Parcel E

Prepared by Bohler

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Page 3

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
9,750	HSG B	PR-E1
0	HSG C	
0	HSG D	
0	Other	
9,750		TOTAL AREA

85 First Street_Proposed Hydrology_Parcel E

Prepared by Bohler

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Page 4

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchment Numbers
0	9,750	0	0	0	9,750	Roofs	P R - E 1
0	9,750	0	0	0	9,750	TOTAL AREA	

85 First Street_Proposed Hydrology_Parcel E

NRCC 24-hr D 2 yr (2070) Rainfall=3.65"

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Page 5

Summary for Subcatchment PR-E1:

Runoff = 0.74 cfs @ 12.13 hrs, Volume= 2,776 cf, Depth= 3.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2 yr (2070) Rainfall=3.65"

Area (sf)	CN	Description
9,750	98	Roofs, HSG B
9,750		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Direct Entry

Summary for Pond 1P: Additional Chambers

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 3.42" for 2 yr (2070) event
 Inflow = 0.74 cfs @ 12.13 hrs, Volume= 2,776 cf
 Outflow = 0.38 cfs @ 12.22 hrs, Volume= 2,776 cf, Atten= 49%, Lag= 5.4 min
 Discarded = 0.01 cfs @ 4.47 hrs, Volume= 1,439 cf
 Primary = 0.37 cfs @ 12.22 hrs, Volume= 1,336 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 16.52' @ 12.22 hrs Surf.Area= 926 sf Storage= 933 cf

Plug-Flow detention time= 273.0 min calculated for 2,775 cf (100% of inflow)
 Center-of-Mass det. time= 273.1 min (1,030.3 - 757.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.00'	850 cf	20.50'W x 45.16'L x 3.50'H Field A 3,240 cf Overall - 1,114 cf Embedded = 2,126 cf x 40.0% Voids
#2A	15.50'	1,114 cf	ADS_StormTech SC-740 x 24 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 4 rows
		1,964 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.00'	0.520 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	18.00'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Primary	16.00'	5.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 4.47 hrs HW=15.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.37 cfs @ 12.22 hrs HW=16.52' (Free Discharge)

↑2=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)

↑3=Orifice/Grate (Orifice Controls 0.37 cfs @ 2.69 fps)

Summary for Link DP-1: Municipal System

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 1.64" for 2 yr (2070) event
Inflow = 0.37 cfs @ 12.22 hrs, Volume= 1,336 cf
Primary = 0.37 cfs @ 12.22 hrs, Volume= 1,336 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment PR-E1:

Runoff = 1.30 cfs @ 12.13 hrs, Volume= 5,006 cf, Depth= 6.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 10 yr (2070) Rainfall=6.40"

Area (sf)	CN	Description
9,750	98	Roofs, HSG B
9,750		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Direct Entry

Summary for Pond 1P: Additional Chambers

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 6.16" for 10 yr (2070) event
 Inflow = 1.30 cfs @ 12.13 hrs, Volume= 5,006 cf
 Outflow = 0.62 cfs @ 12.23 hrs, Volume= 5,006 cf, Atten= 52%, Lag= 6.1 min
 Discarded = 0.01 cfs @ 1.79 hrs, Volume= 1,511 cf
 Primary = 0.61 cfs @ 12.23 hrs, Volume= 3,495 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.06' @ 12.23 hrs Surf.Area= 926 sf Storage= 1,293 cf

Plug-Flow detention time= 186.6 min calculated for 5,006 cf (100% of inflow)
 Center-of-Mass det. time= 186.6 min (932.7 - 746.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.00'	850 cf	20.50'W x 45.16'L x 3.50'H Field A 3,240 cf Overall - 1,114 cf Embedded = 2,126 cf x 40.0% Voids
#2A	15.50'	1,114 cf	ADS_StormTech SC-740 x 24 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 4 rows
		1,964 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.00'	0.520 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	18.00'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Primary	16.00'	5.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 1.79 hrs HW=15.04' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.61 cfs @ 12.23 hrs HW=17.06' (Free Discharge)
 ↑2=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)
 ↑3=Orifice/Grate (Orifice Controls 0.61 cfs @ 4.45 fps)

Summary for Link DP-1: Municipal System

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 4.30" for 10 yr (2070) event
Inflow = 0.61 cfs @ 12.23 hrs, Volume= 3,495 cf
Primary = 0.61 cfs @ 12.23 hrs, Volume= 3,495 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment PR-E1:

Runoff = 1.67 cfs @ 12.13 hrs, Volume= 6,484 cf, Depth= 7.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 NRCC 24-hr D 25 yr (2070) Rainfall=8.22"

Area (sf)	CN	Description
9,750	98	Roofs, HSG B
9,750		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Direct Entry

Summary for Pond 1P: Additional Chambers

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 7.98" for 25 yr (2070) event
 Inflow = 1.67 cfs @ 12.13 hrs, Volume= 6,484 cf
 Outflow = 0.75 cfs @ 12.24 hrs, Volume= 6,484 cf, Atten= 55%, Lag= 6.6 min
 Discarded = 0.01 cfs @ 1.29 hrs, Volume= 1,528 cf
 Primary = 0.73 cfs @ 12.24 hrs, Volume= 4,956 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 17.46' @ 12.24 hrs Surf.Area= 926 sf Storage= 1,531 cf

Plug-Flow detention time= 157.8 min calculated for 6,484 cf (100% of inflow)
 Center-of-Mass det. time= 157.7 min (900.0 - 742.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.00'	850 cf	20.50'W x 45.16'L x 3.50'H Field A 3,240 cf Overall - 1,114 cf Embedded = 2,126 cf x 40.0% Voids
#2A	15.50'	1,114 cf	ADS_StormTech SC-740 x 24 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 4 rows
		1,964 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.00'	0.520 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	18.00'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Primary	16.00'	5.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 1.29 hrs HW=15.04' (Free Discharge)
 ↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.73 cfs @ 12.24 hrs HW=17.46' (Free Discharge)
 ↑2=Sharp-Crested Rectangular Weir(Controls 0.00 cfs)
 ↑3=Orifice/Grate (Orifice Controls 0.73 cfs @ 5.39 fps)

Summary for Link DP-1: Municipal System

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 6.10" for 25 yr (2070) event
Inflow = 0.73 cfs @ 12.24 hrs, Volume= 4,956 cf
Primary = 0.73 cfs @ 12.24 hrs, Volume= 4,956 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Summary for Subcatchment PR-E1:

Runoff = 2.38 cfs @ 12.13 hrs, Volume= 9,310 cf, Depth=11.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100 yr (2070) Rainfall=11.70"

Area (sf)	CN	Description
9,750	98	Roofs, HSG B
9,750		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, Direct Entry

Summary for Pond 1P: Additional Chambers

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 11.46" for 100 yr (2070) event
 Inflow = 2.38 cfs @ 12.13 hrs, Volume= 9,310 cf
 Outflow = 1.90 cfs @ 12.17 hrs, Volume= 9,310 cf, Atten= 20%, Lag= 2.8 min
 Discarded = 0.01 cfs @ 0.86 hrs, Volume= 1,545 cf
 Primary = 1.88 cfs @ 12.17 hrs, Volume= 7,765 cf

Routing by Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
 Peak Elev= 18.18' @ 12.17 hrs Surf.Area= 926 sf Storage= 1,845 cf

Plug-Flow detention time= 122.5 min calculated for 9,310 cf (100% of inflow)
 Center-of-Mass det. time= 122.5 min (860.5 - 738.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	15.00'	850 cf	20.50'W x 45.16'L x 3.50'H Field A 3,240 cf Overall - 1,114 cf Embedded = 2,126 cf x 40.0% Voids
#2A	15.50'	1,114 cf	ADS_StormTech SC-740 x 24 Inside #1 Effective Size= 44.6"W x 30.0"H => 6.45 sf x 7.12'L = 45.9 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap Row Length Adjustment= +0.44' x 6.45 sf x 4 rows
		1,964 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	15.00'	0.520 in/hr Exfiltration over Surface area Phase-In= 0.01'
#2	Primary	18.00'	4.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)
#3	Primary	16.00'	5.0" Vert. Orifice/Grate C= 0.600

Discarded OutFlow Max=0.01 cfs @ 0.86 hrs HW=15.04' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=1.85 cfs @ 12.17 hrs HW=18.17' (Free Discharge)

↑2=Sharp-Crested Rectangular Weir (Weir Controls 0.93 cfs @ 1.36 fps)

↑3=Orifice/Grate (Orifice Controls 0.92 cfs @ 6.75 fps)

Summary for Link DP-1: Municipal System

Inflow Area = 9,750 sf, 100.00% Impervious, Inflow Depth = 9.56" for 100 yr (2070) event
Inflow = 1.88 cfs @ 12.17 hrs, Volume= 7,765 cf
Primary = 1.88 cfs @ 12.17 hrs, Volume= 7,765 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Stage-Area-Storage for Pond 2P: Additional Chambers (Parcel E)

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
15.00	926	0	17.60	926	1,606
15.05	926	19	17.65	926	1,631
15.10	926	37	17.70	926	1,655
15.15	926	56	17.75	926	1,679
15.20	926	74	17.80	926	1,700
15.25	926	93	17.85	926	1,721
15.30	926	111	17.90	926	1,741
15.35	926	130	17.95	926	1,760
15.40	926	148	18.00	926	1,779
15.45	926	167	18.05	926	1,798
15.50	926	185	18.10	926	1,816
15.55	926	223	18.15	926	1,835
15.60	926	261	18.20	926	1,853
15.65	926	298	18.25	926	1,872
15.70	926	336	18.30	926	1,890
15.75	926	373	18.35	926	1,909
15.80	926	411	18.40	926	1,927
15.85	926	448	18.45	926	1,946
15.90	926	485	18.50	926	1,964
15.95	926	522			
16.00	926	559			
16.05	926	596			
16.10	926	632			
16.15	926	669			
16.20	926	705			
16.25	926	741			
16.30	926	776			
16.35	926	812			
16.40	926	847			
16.45	926	883			
16.50	926	918			
16.55	926	952			
16.60	926	987			
16.65	926	1,021			
16.70	926	1,055			
16.75	926	1,089			
16.80	926	1,122			
16.85	926	1,155			
16.90	926	1,188			
16.95	926	1,221			
17.00	926	1,253			
17.05	926	1,285			
17.10	926	1,317			
17.15	926	1,348			
17.20	926	1,378			
17.25	926	1,409			
17.30	926	1,438			
17.35	926	1,468			
17.40	926	1,496			
17.45	926	1,525			
17.50	926	1,552			
17.55	926	1,579			

Lowest Invert: El. 16.00 (5" orifice)
 Volume @ Lowest Invert: 559 CF

Proposed Residential Development

75-85 First St

Cambridge, MA

Bohler Job Number: MAB220072

July 25, 2022

MA DEP Standard 4: Weighted TSS Removal Rate

Design Point - Treatment Train Description(s)	TSS Removal (%)	Treated Imp. Area* (ac)	Untreated Imp. Area (ac)
PR-E1 TO DP-01	80	0.224	0.000
Weighted TSS Removal Rate	80		

Prepared By:
BOHLER
45 Franklin Street, 5th Floor
Boston, MA 02110
(617) 849-8040

7/26/2022

Location: 75-85 FIRST STREET

TSS Removal Calculation Worksheet

A BMP ¹	B TSS Removal Rate ¹	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Subsurface Infiltration System	0.80	1.00	0.80	0.20

Total TSS Removal =

80%

Project: 75-85 First Street
 Prepared By: Bohler
 Date: 7/25/2022

*Equals remaining load from previous BMP (E) which enters the BMP

Proposed Residential Development
75-85 First Street
Cambridge, MA
Bohler Job Number: MAB220072
July 8, 2022

Weighted Total Phosphorus Removal Rate

Structural BMP Phosphorus Removal

Subcatchment	Design Point	Phosphorus Loading (lbs/year)	Total Phosphorus Treatment Train	TP Removal (%)	TP Removal (lbs/year)
PR-E1	DP-01	0.52	#1	68%	0.35
Total		0.52			0.35
Weighted Total Phosphorus Removal Rate				68%	

Phosphorus Loading Calculation Proposed Conditions					
Subcatchment	Design Point	Land Use	Area (sf)	Phosphorus Load Export (lbs/acre/year)	Phosphorus Load (lbs/year)
PR-01	DP-01	Multi-Family Residential	9,750	2.32	0.52

DP Summary Table - Proposed Conditions	
Design Point	Phosphorus Load Export (lbs/year)
DP-01	0.52
TOTAL	0.52

Subcatchment Summary Table - Proposed Conditions	
Subcatchment	Phosphorus Load Export (lbs/year)
PR-E1	0.52
TOTAL	0.52

Phosphorus Loading By Use Table

Land Use	Phosphorus Load Export (lbs/acre/year)
Commercial	1.78
Industrial	1.78
Multi-Family Residential	2.32
High-Density Residential	2.32
Medium-Density Residential	1.96
Low-Density Residential	1.52
Highway	1.34
Forest - Impervious	1.52
Forest - Pervious	0.13
Agriculture - Impervious	1.52
Agriculture - Pervious	0.45
Developed Land - HSG A	0.03
Developed Land - HSG B	0.12
Developed Land - HSG C	0.21
Developed Land - HSG C/D	0.29
Developed Land - HSG D	0.37

Subcatchments: PR-E1

Treatment Train #1

**Total Phosphorus
Removal Calculation
Worksheet**

A BMP ¹	B TP Removal Rate ¹	C Starting TP Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Subsurface Infiltration System (0.52 in/hr)	0.68	1.00	0.68	0.32

Total Phosphorus Removal = 68%

Project: 75-85 First Street
Prepared By: Bohler
Date: 7/8/2022

*Equals remaining load from previous BMP (E)
which enters the BMP