



steer environmental  
associates ltd.

June 2, 2022

Thurber Engineering Ltd.  
900 – 1281 West Georgia Street  
Vancouver, BC  
V6E 3J7

Attention: Carol Ma

Dear Ms. Ma

**RE: Performance Verification Plan  
688 Cambie Street, Vancouver, BC  
Site ID: 1244**

The Performance Verification Plan (PVP) for the above referenced property (the Site) is as follows.

#### **SITE IDENTIFICATION AND RISK CONTROL TYPE**

ENV Site ID: 1244

Site Location: 688 Cambie Street, BC. See Figure 1A attached.

Site Type: 2

This document is meant to satisfy the reporting requirements for Type 2 site risk controls as outlined on the BC Ministry of Environment and Climate Change Strategy (ENV) website<sup>1</sup>. Specifically, this document outlines the performance verification plan for implementing the risk controls described below.

#### **REQUIRED RISK CONTROLS**

The following risk control is required at the Site:

- a. Contaminated soil must remain located beneath the Site buildings, pavement or in the subsurface (>1m depth).

The risk control applies to the Site as presented in the attached metes and bounds description (Figure 1B) and Figures 4A/B/C and 5A/C.

#### **ACTIONS REQUIRED TO IMPLEMENT RISK CONTROLS**

The following action is required to implement the above risk control:

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<sup>1</sup><https://www2.gov.bc.ca/gov/content/environment/air-land-water/site-remediation/remediation-planning/remediation-plan-aip/performance-verification-plans?keyword=performance&keyword=verification>

- a. Mandatory communication by the Site owner/operator with relevant Site personnel that contaminated soils must remain beneath the Site building, pavement, or in the subsurface (>1m depth).

Records of this performance verification action should be maintained by the Site owner and submitted to the ENV if requested. If/when ownership or control of the Site is transferred, it is the responsibility of the owner to ensure this document and associated responsibilities are transferred to an individual representing the future Site owner/lessee.

The Director must be notified promptly by the persons responsible for the Site if the performance verification actions indicate that the required risk control is not being met. The following information must be submitted to the Director with the notification, or as soon as practicable thereafter:

- a. The time period over which the risk control did not meet the requirements;
- b. The nature of the excursions;
- c. The temporary or permanent corrective measures implemented or to be implemented;
- d. An implementation schedule; and
- e. Supporting documentation.

## **RATIONALE FOR SELECTING PERFORMANCE VERIFICATION PLAN ELEMENTS**

The human health and ecological risk assessment conducted for the Site (Steer Environmental, 2022<sup>2</sup>) assumed that contaminated soil, under the current Site use scenario, remain beneath pavement or in the subsurface (>1m depth); under the future Site use scenario, it was assumed that the majority of contaminated soil (save a 5m setback along the southeastern boundary) will be physically removed from the Site. These intrinsic Site conditions prevent contaminant exposures by people, plants and animals.

Formal inspection of the risk control is not required as it is highly unlikely that pavement and/or buildings would be removed and/or for subsurface soils to be brought to the surface causing exposure to human or ecological receptors except in the case of Site redevelopment for which site-specific health and safety plans will be developed.

In the unlikely chance that there is a sudden failure of risk controls and contaminated soils exposed, the risk of receptor exposure to contaminants would likely be limited to construction or utility workers. The risk of acute effects from contaminant exposure are minimal.

It is our opinion that the risk control and performance verification actions specified herein are sufficient to ensure human health and ecological risks at the Site remain acceptable as defined by the Contaminated Sites Regulation.

## **LIMITATIONS**

This report has been prepared solely for the use of Thurber Engineering Ltd. (Thurber), the City of Vancouver (City), the British Columbia Society of Contaminated Sites Approved Professionals (CSAP), and the British Columbia Ministry of Environment and Climate Change Strategy (ENV). By using this report Thurber, City, CSAP, and ENV agree that they will review and use the report in its entirety. Any use which other parties make of this report, or any reliance on, or decision made based on it, are the responsibility of such parties. Steer Environmental

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<sup>2</sup> *Human Health and Ecological Risk Assessment, 688 Cambie Street, Vancouver, BC.* Prepared by Steer Environmental Associates Ltd. Dated May 2022.

Associates Ltd. accepts no responsibility for damages, if any, suffered by other parties as a result of decisions made or actions based on this report.

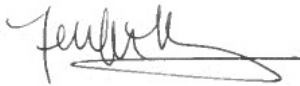
The services performed as described in this report were conducted in a manner consistent with the level of care and skill normally exercised by other members of the environmental science profession currently practicing under similar conditions, subject to the time limits, and financial and physical constraints applicable to the services.

The findings of this assessment are based on information collected during previous Site investigations, our present understanding of the Site conditions, and our professional judgement in light of such information at the time the report was prepared. This report provides a professional opinion and, therefore, no warranty is expressed, implied, or made as to the conclusions, advice, and recommendations presented in this report.

The findings and conclusions of the assessment are specific to the information and assumptions upon which they are based.

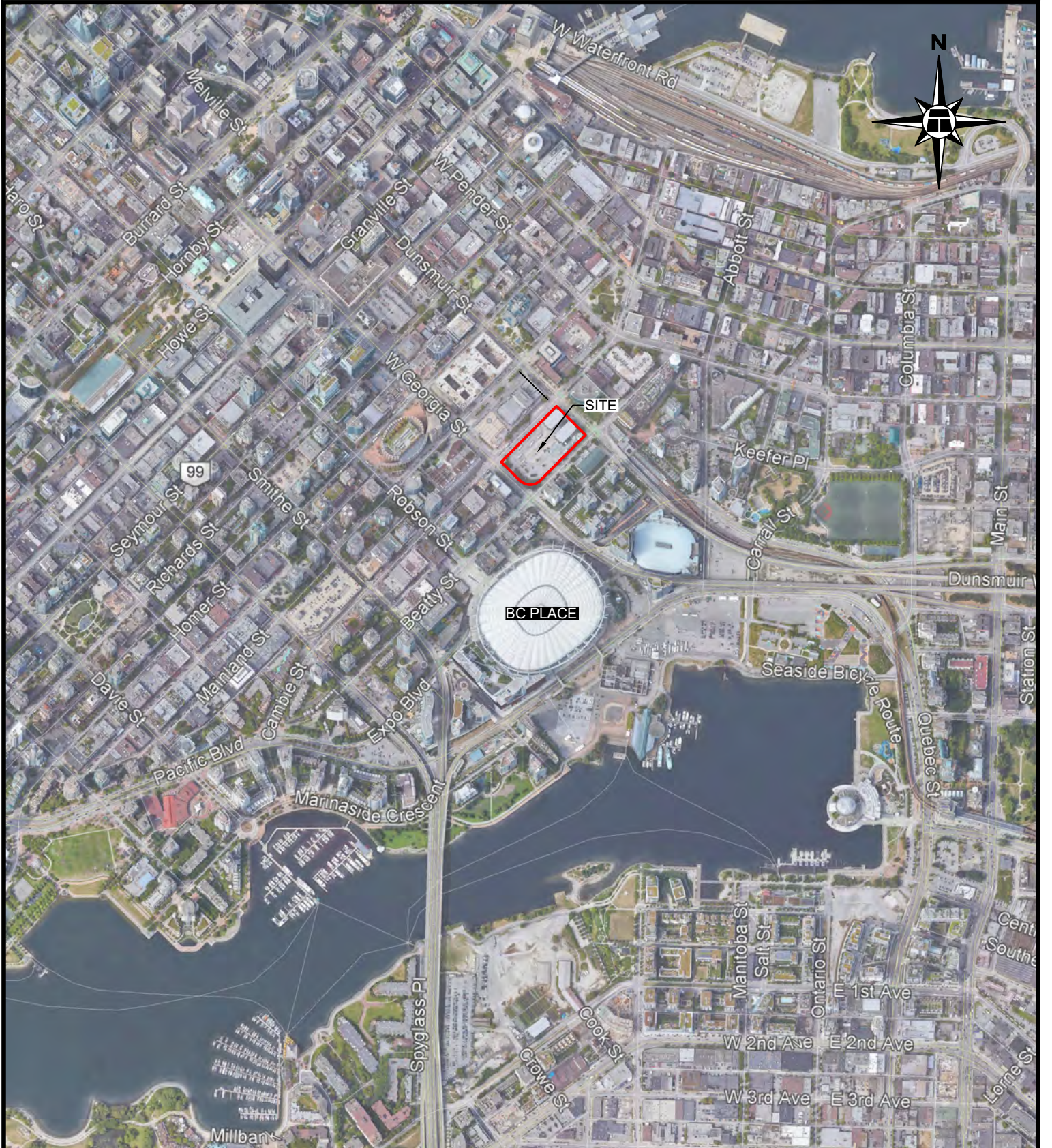
Sincerely,

**Steer Environmental Associates Ltd.**

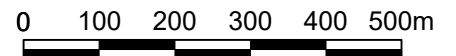



Jennifer Mayberry, B.Sc.  
Senior Environmental Scientist

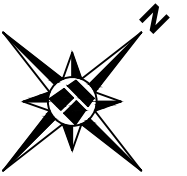
- Attached:
- Figure 1A – General Site Location
  - Figure 1B - Metes and Bounds Description
  - Figure 4A – 1993-1999 Remedial Excavation Limits and Soil Investigation Results
  - Figure 4B – Soil Analytical Results – Fill
  - Figure 4C – Soil Analytical Results – Native Soil – Hydrocarbons and VOC (On-Site)
  - Figure 5A – Groundwater Analytical Results - Hydrocarbons (On-Site)
  - Figure 5C – Groundwater Analytical Results - VH, VPH and VOC (On-Site)



NOTES:  
 1. AERIAL IMAGE TAKEN FROM GOOGLE EARTH.



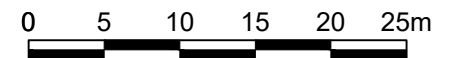
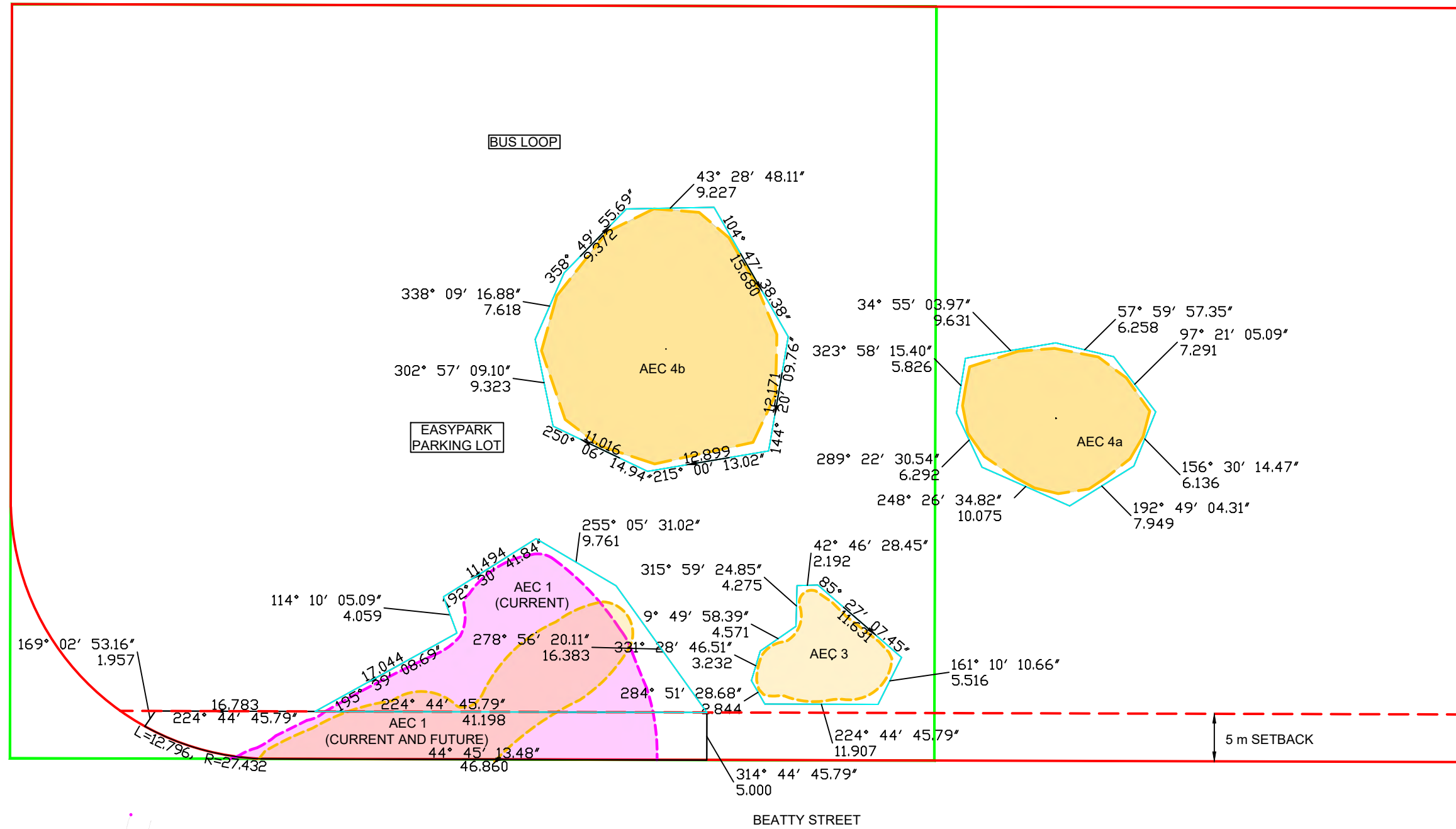
 <b>THURBER ENGINEERING LTD.</b>	CLIENT	CITY OF VANCOUVER		DESIGNED	CM	DRAWN	MOM	APPROVED	
	<b>GENERAL SITE LOCATION</b> 688 CAMBIE STRET VANCOUVER, B.C.			DATE	APR 28, 2022		SCALE		1:10,000
				PROJECT No.	22720		FIG. No.	1A	REV.



CAMBIE STREET

W. GEORGIA STREET

DUNSMUIR STREET



**LEGEND:**

	SITE BOUNDARY
	FUTURE VAG SITE
	GROUNDWATER IMPACTS
	SOIL IMPACTS

**NOTES:**

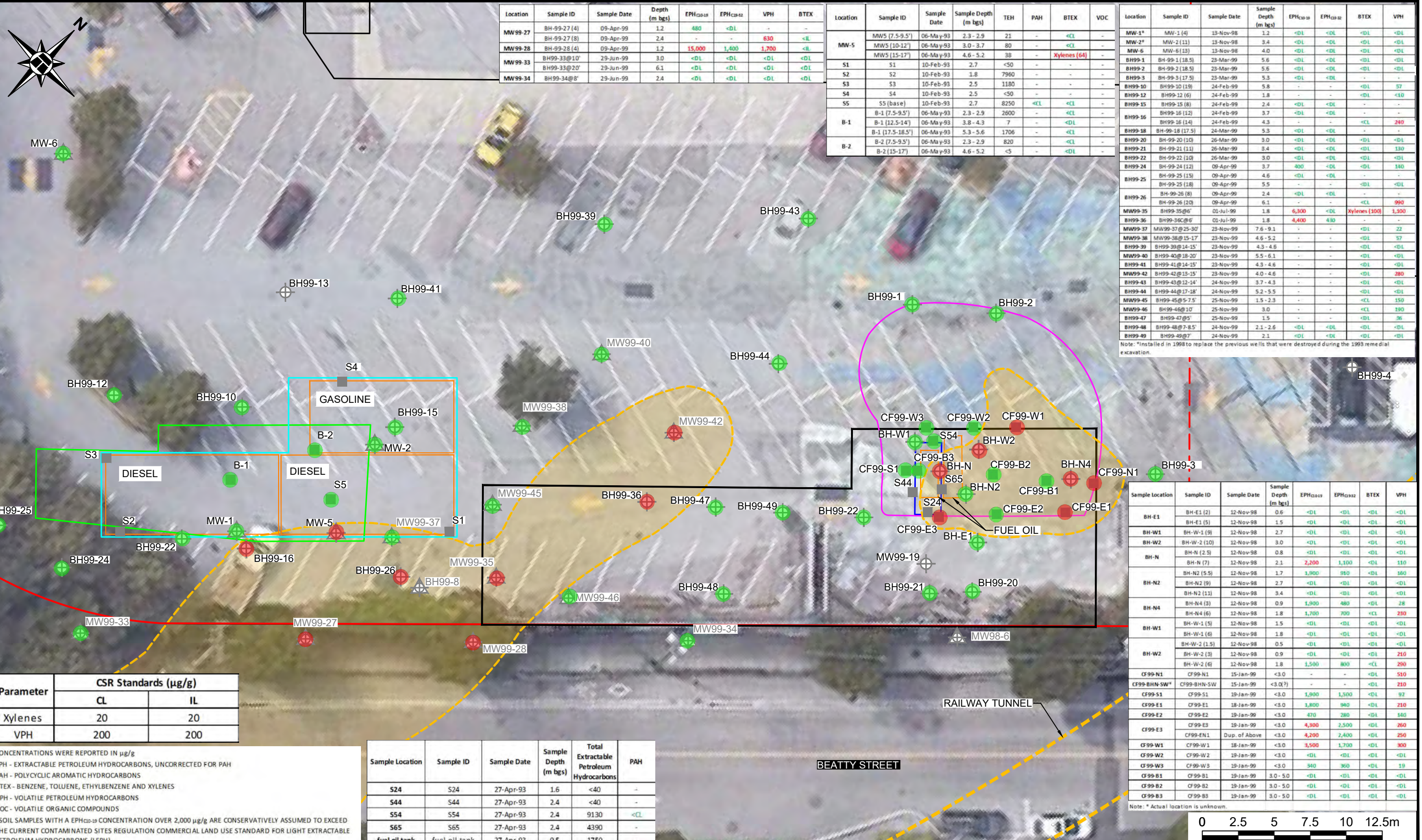
- LOT LINES TAKEN FROM THE CITY OF VANCOUVER OPEN DATA CATALOGUE.



CLIENT	CITY OF VANCOUVER
<b>METES AND BOUNDS FOR AECS ON 688 CAMBIE</b>	
688 CAMBIE STREET	VANCOUVER, B.C.

DESIGNED	DRAWN	APPROVED
CM	JL	
DATE	SCALE	
APR 28, 2022	1:500	
PROJECT No.	FIG. No.	REV.
22720	1B	0

Plotted: June 1, 2022



Location	Sample ID	Sample Date	Depth (m bgs)	EPH <sub>C30-39</sub>	EPH <sub>C30-42</sub>	VPH	BTEX
MW99-27	BH-99-27 (4)	09-Apr-99	1.2	480	<DL	-	-
	BH-99-27 (8)	09-Apr-99	2.4	-	-	630	<IL
MW99-28	BH-99-28 (4)	09-Apr-99	1.2	15,000	1,400	1,700	<DL
	BH99-33@10'	29-Jun-99	3.0	<DL	<DL	<DL	<DL
MW99-33	BH99-33@20'	29-Jun-99	6.1	<DL	<DL	<DL	<DL
	BH99-34@8'	29-Jun-99	2.4	<DL	<DL	<DL	<DL

Location	Sample ID	Sample Date	Sample Depth (m bgs)	TEH	PAH	BTEX	VOC
MW-5	MWS (7.5-9.5')	06-May-93	2.3 - 2.9	21	-	<CL	-
	MWS (10-12')	06-May-93	3.0 - 3.7	80	-	<CL	-
	MWS (15-17')	06-May-93	4.6 - 5.2	38	-	Xylenes (64)	-
S1	S1	10-Feb-93	2.7	<50	-	-	-
	S2	10-Feb-93	1.8	7960	-	-	-
	S3	10-Feb-93	2.5	1180	-	-	-
	S4	10-Feb-93	2.5	<50	-	-	-
	S5	S5 (base)	10-Feb-93	2.7	8250	<CL	<CL

Location	Sample ID	Sample Date	Sample Depth (m bgs)	EPH <sub>C30-39</sub>	EPH <sub>C30-42</sub>	BTEX	VPH
MW-1*	MW-1 (4)	13-Nov-98	1.2	<DL	<DL	<DL	<DL
MW-2*	MW-2 (11)	13-Nov-98	3.4	<DL	<DL	<DL	<DL
MW-6	MW-6 (13)	13-Nov-98	4.0	<DL	<DL	<DL	<DL
	BH99-1	BH-99-1 (18.5)	23-Mar-99	5.6	<DL	<DL	<DL

Note: \* Installed in 1998 to replace the previous wells that were destroyed during the 1993 remedial excavation.

Parameter	CSR Standards (µg/g)	
	CL	IL
Xylenes	20	20
VPH	200	200

CONCENTRATIONS WERE REPORTED IN µg/g  
 EPH - EXTRACTABLE PETROLEUM HYDROCARBONS, UNCORRECTED FOR PAH  
 PAH - POLYCYCLIC AROMATIC HYDROCARBONS  
 BTEX - BENZENE, TOLUENE, ETHYLBENZENE AND XYLENES  
 VPH - VOLATILE PETROLEUM HYDROCARBONS  
 VOC - VOLATILE ORGANIC COMPOUNDS  
 \*SOIL SAMPLES WITH A EPH<sub>C30-39</sub> CONCENTRATION OVER 2,000 µg/g ARE CONSERVATIVELY ASSUMED TO EXCEED THE CURRENT CONTAMINATED SITES REGULATION COMMERCIAL LAND USE STANDARD FOR LIGHT EXTRACTABLE PETROLEUM HYDROCARBONS (LEPH)

Sample Location	Sample ID	Sample Date	Sample Depth (m bgs)	Total Extractable Petroleum Hydrocarbons	PAH
S24	S24	27-Apr-93	1.6	<40	-
S44	S44	27-Apr-93	2.4	<40	-
S54	S54	27-Apr-93	2.4	9130	<CL
S65	S65	27-Apr-93	2.4	4390	-
fuel oil tank	fuel oil tank	27-Apr-93	0.5	1750	-

Sample Location	Sample ID	Sample Date	Sample Depth (m bgs)	EPH <sub>C30-39</sub>	EPH <sub>C30-42</sub>	BTEX	VPH
BH-E1	BH-E1 (2)	12-Nov-98	0.6	<DL	<DL	<DL	<DL
	BH-E1 (5)	12-Nov-98	1.5	<DL	<DL	<DL	<DL
BH-W1	BH-W-1 (9)	12-Nov-98	2.7	<DL	<DL	<DL	<DL

**LEGEND:**

- SITE BOUNDARY
- 1994 EXCAVATION LIMITS
- APR 1993 EXCAVATION LIMITS
- FEB 1993 EXCAVATION LIMITS
- JAN 1999 EXCAVATION LIMITS
- BOREHOLE (BY OTHERS)
- MONITORING WELL (BY OTHERS)
- CONFIRMATORY SOIL SAMPLES (BY OTHERS)
- FORMER ASTs/USTs
- CONCENTRATIONS ARE BELOW APPLICABLE CSR STANDARDS
- CONCENTRATIONS ARE ABOVE APPLICABLE CSR STANDARDS
- APPROXIMATE EXTENT OF HC CONTAMINATION IN SOIL

CLIENT  
**CITY OF VANCOUVER**  
 688 CAMBIE STREET  
 VANCOUVER, B.C.

**1993-1999 REMEDIAL EXCAVATION LIMITS AND SOIL INVESTIGATION RESULTS**

DESIGNED: CM | DRAWN: JL | APPROVED: JL

DATE: APR 25, 2022 | SCALE: 1:250

PROJECT No: 22720 | FIG. No: 4A | REV: 0

Location	Sample ID	Sample Date	Depth (m bgs)	EPH <sub>C10-19</sub> / EPH <sub>C19-32</sub>	BTEX	VPH	Metals
BH99-2	BH-99-2 (8)	23-Mar-99	2.4	-	-	-	<CL
BH99-4	BH-99-4 (4)	23-Mar-99	1.2	-	-	-	<CL
BH99-5	BH-99-5 (4)	23-Mar-99	1.2	-	-	-	Pb (177) >CL but <P4
BH99-6	BH-99-6 (6.5)	23-Mar-99	2.0	-	-	-	<CL
BH99-7	BH-99-7 (4)	24-Mar-99	1.2	-	-	-	<CL
BH99-8	BH-99-8 (4)	24-Mar-99	1.2	-	-	-	<CL
MW99-9	BH-99-9 (4)	24-Mar-99	1.2	-	-	-	<CL
BH99-12	BH99-12 (6)	24-Feb-99	1.8	-	<DL	-	-
BH99-15	BH99-15	24-Feb-99	2.4	<DL	-	-	-
BH99-17*	BH-99-17 (4)	24-Mar-99	1.2	-	-	-	<CL
BH99-26	BH99-26	09-Apr-99	2.4	<DL	-	-	-
MW99-37	BH99-37	23-Nov-99	2.4 - 3.0	-	<CL	99	-
MW98-38	99-38	23-Nov-99	4.6	-	<DL	57	-

\*BH location is unknown to us.

Location	Sample ID	Sample Date	Depth (m bgs)	L/HEPH	Naphthalene	Other PAH	Metals
AE12-MW1	AE12-MW1-1	18-Jun-12	0.7	-	-	-	<CL
AE12-MW1	AE12-MW1-2	18-Jun-12	1.3	<DL	0.055	<CL	-
AE12-MW2S/D	AE12-MW2-2	18-Jun-12	1.3	<DL	<DL	<DL	-
AE12-MW3S/D	AE12-MW3-1	19-Jun-12	0.5	<DL	0.138	<CL	-
AE12-MW3S/D	AE12-MW3-2	19-Jun-12	1.3	-	-	-	<CL
AE12-BH4	AE12-BH4-1	19-Jun-12	0.75	<DL	<DL	<DL	<CL
AE12-BH5	AE12-BH5-1	19-Jun-12	0.5	-	-	-	<CL
AE12-BH5	AE12-BH5-2	19-Jun-12	1.3	<DL	<DL	<DL	<CL
AE12-BH6	AE12-BH6-2	19-Jun-12	2.1	-	-	-	Pb (161) >CL but <P4
AE12-BH6	AE12-BH6-3	19-Jun-12	2.7	<DL	<DL	<DL	<CL
AE12-BH6	AE12-BH6-3	Dup. of Above	2.7	<DL	<DL	<DL	<CL
AE12-SV7S/D	AE12-BH7-2	19-Jun-12	1.3	<DL	<DL	<CL	<CL
AE12-BH8	AE12-BH8-1	19-Jun-12	0.4	<DL	<DL	<CL	Pb (536) >CL and P4
AE12-BH8	AE12-BH8-2	19-Jun-12	0.7	<DL	<DL	<CL	<CL
AE12-BH8	AE12-BH8-4	19-Jun-12	2.5	<DL	<DL	<CL	<CL
AE12-MW9S/D	AE12-MW9-1	19-Jun-12	0.6	<DL	<DL	<CL	<CL
AE13-MW6S/D	AE13-MW6-1	30-Aug-13	0.8	<DL	0.099	<CL	<CL
AE13-MW6S/D	AE13-MW6-11	Dup. of Above	0.8	-	-	-	<CL
AE13-MW6S/D	AE13-MW6-3	30-Aug-13	2.5	-	-	-	<CL
BH18-01V	BH18-01-2	31-May-18	1.2 - 1.5	<DL	<DL	<DL	<CL
BH18-01V	BH18-01-2	Dup. of Above	1.2 - 1.5	<DL	<DL	<DL	<CL
BH21-03MV	BH21-03-01	14-Jul-21	0.9 - 1.2	<CL	<DL	<DL	<CL
BH21-04MS/D	BH21-04-01	14-Jul-21	0.9 - 1.2	<CL	<DL	<DL	Se (1.16) >CL but <P4
BH21-05M	BH21-05-01	15-Jul-21	0.9 - 1.2	<DL	<DL	<DL	<CL
BH21-06M	BH21-06-01	14-Jul-21	0.9 - 1.2	<DL	<DL	<DL	<CL
BH21-07MS/D	BH21-07-01	15-Jul-21	0.9 - 1.2	<DL	<DL	<DL	<CL
TH21-01	TH21-01-01	14-Jul-21	0.3 - 0.5	<CL	<DL	<CL	<CL
TH21-01	TH21-01-01	Dup. of Above	0.3 - 0.5	<CL	<DL	<CL	<CL
TH21-02	TH21-02-01	14-Jul-21	0.3 - 0.5	-	-	-	<CL
TH21-03	TH21-03-01	14-Jul-21	0.3 - 0.5	-	-	-	<CL
TH21-05	TH21-05-02	13-Sep-21	1.4 - 1.5	<DL	<DL	<DL	<CL
TH21-05	TH21-06-01	13-Sep-21	0.7 - 0.9	-	-	-	<CL
TH21-06	TH21-06-02	13-Sep-21	1.4 - 1.5	<DL	<DL	<DL	<CL
TH21-06	TH21-M	Dup. of Above	1.4 - 1.5	<DL	<DL	<DL	<CL
TH21-07	TH21-07-01	10-Sep-21	0.6	<CL	<DL	<CL	Zn (1,320) >CL and P4
TH21-07	TH21-07-01	RE1 of Above	0.6	-	-	-	Zn (165) >CL and P4
TH21-07	TH21-07-01	RE2 of Above	0.6	-	-	-	Zn (986) >CL and P4
TH21-07	TH21-07-02	10-Sep-21	1.1	-	-	-	Zn (43) <CL
TH21-08	TH21-08-01	10-Sep-21	0.9	<DL	<DL	<DL	<CL

CONCENTRATIONS WERE REPORTED IN  $\mu\text{g/g}$   
 EPH - EXTRACTABLE PETROLEUM HYDROCARBONS  
 L/HEPH - LIGHT AND HEAVY EXTRACTABLE PETROLEUM HYDROCARBONS  
 VPH - VOLATILE PETROLEUM HYDROCARBONS  
 PAH - POLYCYCLIC AROMATIC HYDROCARBONS  
 BTEX - BENZENE, TOLUENE, ETHYLBENZENE AND XYLENES  
 CSR - BC CONTAMINATED SITES REGULATION  
 CL - CSR SOIL STANDARDS FOR COMMERCIAL LAND USE (ON-SITE SOIL WITHIN TOP 3 M)  
 P4 - CSR PROTOCOL 4 LOCAL BACKGROUND CONCENTRATIONS IN SOIL

<DL - BELOW LABORATORY DETECTION LIMITS  
 <CL - BELOW CSR CL STANDARD(S)  
 >CL - ABOVE CSR CL STANDARD(S)  
 <P4 - BELOW CSR PROTOCOL 4 STANDARD  
 >P4 - ABOVE CSR PROTOCOL 4 STANDARD

- NOTES:  
 1. AERIAL IMAGE TAKEN FROM GOOGLE EARTH.  
 2. LOT LINES TAKEN FROM THE CITY OF VANCOUVER OPEN DATA CATALOGUE.  
 3. SAMPLING LOCATIONS ARE APPROXIMATE.

Parameter	CSR Standards ( $\mu\text{g/g}$ )	
	CL	P4
Lead (Pb)	120-150, pH-dependent	300
Selenium (Se)	1	4
Zinc (Zn)	150	90

● CONCENTRATIONS ARE BELOW APPLICABLE CSR STANDARDS  
 ● CONCENTRATIONS ARE ABOVE APPLICABLE CSR STANDARDS

**LEGEND:**

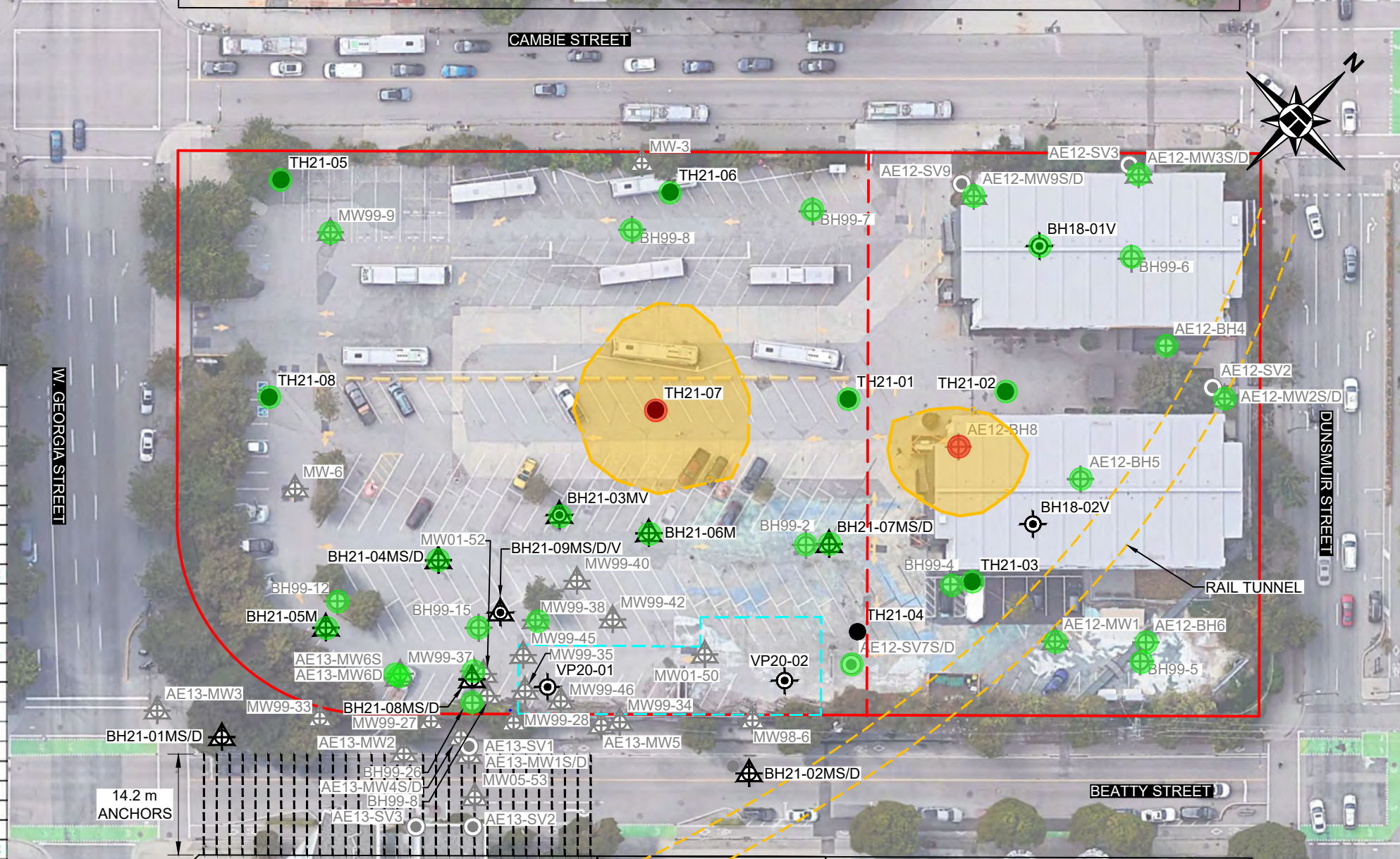
- SITE BOUNDARY
- MONITORING WELL (THURBER 2021)
- MONITORING WELL (THURBER 2018 / 2020)
- APPROXIMATE EXTENT OF METAL CONTAMINATION IN SOIL
- MONITORING WELL (BY OTHERS)
- VAPOUR PROBE (BY OTHERS)
- VAPOUR PROBE (THURBER 2021)
- STORM DRAIN SAMPLE (BY OTHERS)
- HYDROVAC HOLE (THURBER 2021)



CLIENT: CITY OF VANCOUVER  
 688 CAMBIE STREET VANCOUVER, B.C.

**SOIL ANALYTICAL RESULTS - FILL**

DESIGNED CM	DRAWN MOM	APPROVED
DATE APR 28, 2022	SCALE 1:750	
PROJECT No. 22720	FIG. No. 4B	REV. 0



**On-Site**

Location	Sample ID	Sample Date	Depth (m bgs)	LEPH	HEPH	PAH	BTEXS	VPH	Other Fuel VOC
AE12-MW1	AE12-MW1-15	18-Jun-12	16.3	<DL	<DL	<DL	-	-	-
	AE12-MW2-5	18-Jun-12	5.0	<DL	<DL	<DL	<DL	<DL	<DL
AE12-MW2S/D	AE12-MW2-12	18-Jun-12	15.9	<DL	<DL	<IL	-	-	-
	AE12-MW2-13	18-Jun-12	17.2	<DL	<DL	<DL	-	-	-
AE12-MW3S/D	AE12-MW3-5	18-Jun-12	3.7	<DL	<DL	<DL	<DL	<DL	-
	AE12-MW3-6	18-Jun-12	5.3	-	-	-	<DL	-	<DL
AE12-MW9S/D	AE12-MW9-3	19-Jun-12	4.0	<DL	<DL	<DL	<DL	<DL	-
	AE12-MW6/5	30-Aug-13	4.3	<DL	<DL	<DL	<DL	<DL	-
AE13-MW6S/D	AE13-MW6/12	Dup. of Above	4.3	<DL	<DL	<DL	<DL	<DL	-
	AE13-MW6/9	30-Aug-13	6.9	<DL	<DL	<IL	<DL	<DL	-
	AE13-MW6/10	30-Aug-13	7.4	<DL	<DL	<DL	<IL	<DL	-
BH21-03MV	BH21-03-02	14-Jul-21	1.7 - 1.8	<DL	<DL	<DL	<DL	<DL	<CL
	BH21-03-08	14-Jul-21	7.9 - 8.0	<DL	<DL	<DL	<DL	<DL	<IL
BH21-04MS/D	BH21-04-05	14-Jul-21	4.9 - 5.0	<DL	<DL	<DL	<DL	<DL	<DL
	BH21-04-07	14-Jul-21	7.0 - 7.2	<DL	<DL	<DL	<DL	<DL	<DL
BH21-05M	BH21-05-03	15-Jul-21	2.9 - 3.0	<DL	<DL	<DL	<DL	<DL	<DL
	BH21-05-09	15-Jul-21	7.6 - 7.8	<DL	<DL	<DL	<DL	<DL	<DL
BH21-06M	BH21-06-06	14-Jul-21	4.9 - 5.0	<DL	<DL	<DL	<DL	<DL	<DL
	BH21-06-10	14-Jul-21	9.0 - 9.1	<DL	<DL	<DL	<DL	<DL	<DL
BH21-07MS/D	BH21-07-10	15-Jul-21	9.0 - 9.1	<DL	<DL	<DL	<DL	<DL	<DL
	BH21-I	Dup. of Above	9.0 - 9.1	<DL	<DL	<DL	<DL	<DL	<IL
BH21-08MS/D	BH21-08-06	10-Sep-21	5.0 - 5.2	<DL	<DL	<CL	<CL	<DL	<CL
	BH21-08-09	10-Sep-21	8.1 - 8.2	1,700	130	<IL	<CL	490	<IL
	BH21-08-10	10-Sep-21	9.1 - 9.3	<DL	<DL	<DL	<DL	33	<IL
BH21-09MS/D/V	BH21-09-04	13-Sep-21	3.5 - 3.7	<DL	<DL	<DL	<DL	<DL	<DL
	BH21-J	Dup. of Above	3.5 - 3.7	<DL	<DL	<DL	<DL	<DL	<DL
BH21-09-08	BH21-09-08	13-Sep-21	7.8 - 7.9	<DL	<DL	<DL	<DL	<DL	<DL

CONCENTRATIONS WERE REPORTED IN µg/g  
 LEPH - LIGHT EXTRACTABLE PETROLEUM HYDROCARBONS  
 HEPH - HEAVY EXTRACTABLE PETROLEUM HYDROCARBONS  
 PAH - POLYCYCLIC AROMATIC HYDROCARBONS  
 BTEXS - BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND STYRENE  
 VPH - VOLATILE PETROLEUM HYDROCARBONS  
 VOC - VOLATILE ORGANIC COMPOUNDS  
 CSR - BC CONTAMINATED SITES REGULATION  
 CL - CSR SOIL STANDARDS FOR COMMERCIAL LAND USE (ON-SITE SOIL)  
 IL - CSR SOIL STANDARDS FOR INDUSTRIAL LAND USE (OFF-SITE AND ON-SITE SOIL 6 METRES BELOW THE CURRENT PARKING LOT GRADE)

<DL - BELOW LABORATORY DETECTION LIMITS  
 <CL - BELOW CSR CL STANDARDS  
 <IL - BELOW CSR IL STANDARDS

- NOTES:**
- AERIAL IMAGE TAKEN FROM GOOGLE EARTH.
  - LOT LINES TAKEN FROM THE CITY OF VANCOUVER OPEN DATA CATALOGUE.
  - SAMPLING LOCATIONS ARE APPROXIMATE.

- CONCENTRATIONS ARE ABOVE APPLICABLE CSR STANDARDS
- CONCENTRATIONS ARE BELOW APPLICABLE CSR STANDARDS

Parameter	CSR Standards (µg/g)	
	CL	IL
VPH	200	200



**LEGEND:**

- [Red outline] SITE BOUNDARY
- [Triangle with cross] MONITORING WELL (THURBER 2021)
- [Triangle with cross and dot] MONITORING WELL WITH NESTED VAPOUR PROBE (THURBER 2021)
- [Circle with dot] HYDROVAC HOLE (THURBER 2021)
- [Circle with dot] VAPOUR PROBE (BY OTHERS)
- [Circle with dot] STORM DRAIN SAMPLE (BY OTHERS)
- [Triangle with cross] BOREHOLE (BY OTHERS)
- [Triangle with cross and dot] MONITORING WELL (BY OTHERS)
- [Yellow circle] APPROXIMATE EXTENT OF HC CONTAMINATION IN SOIL

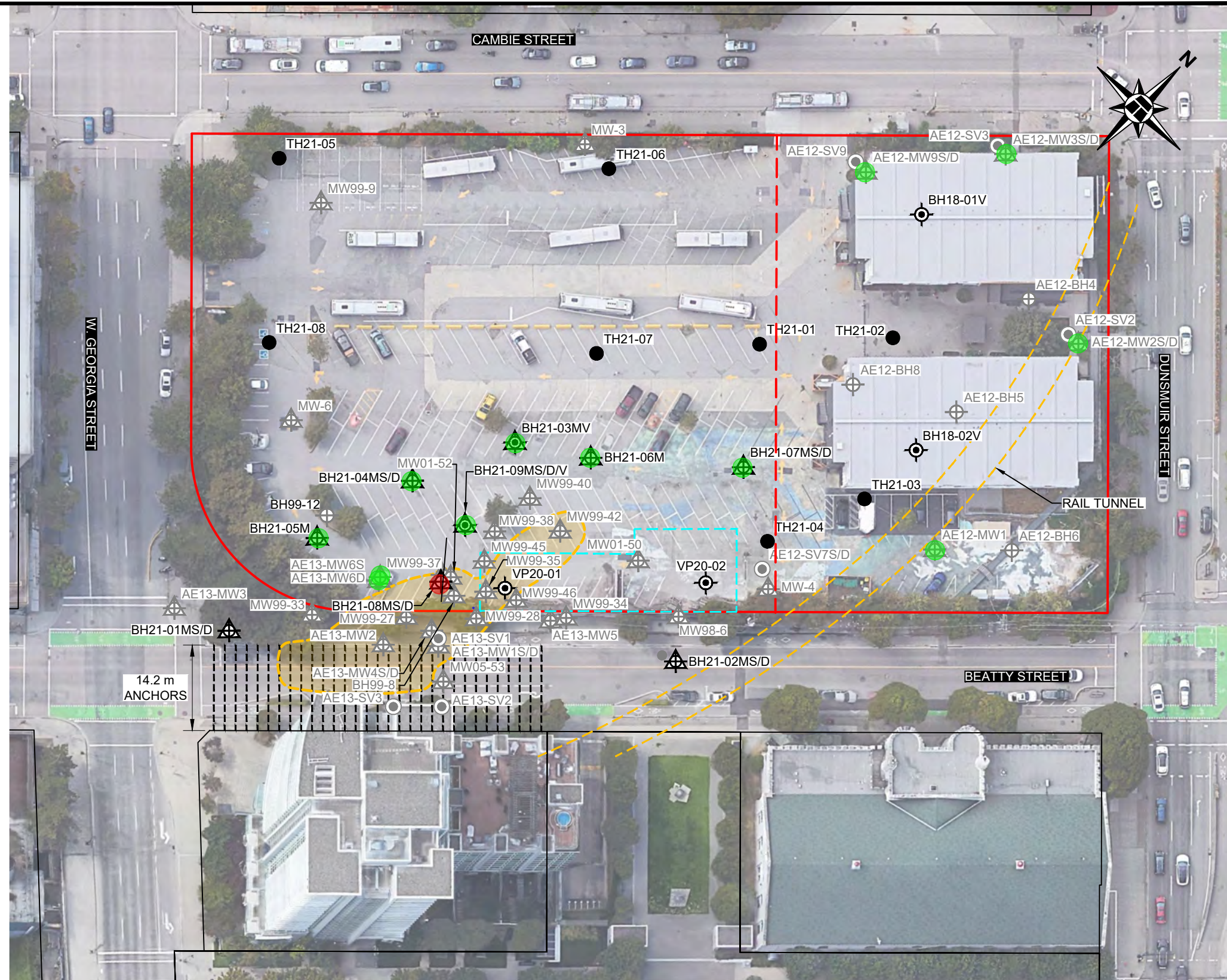


CLIENT: CITY OF VANCOUVER

688 CAMBIE STREET VANCOUVER, B.C.

**SOIL ANALYTICAL RESULTS - NATIVE SOIL - HYDROCARBONS AND VOC (ON-SITE)**

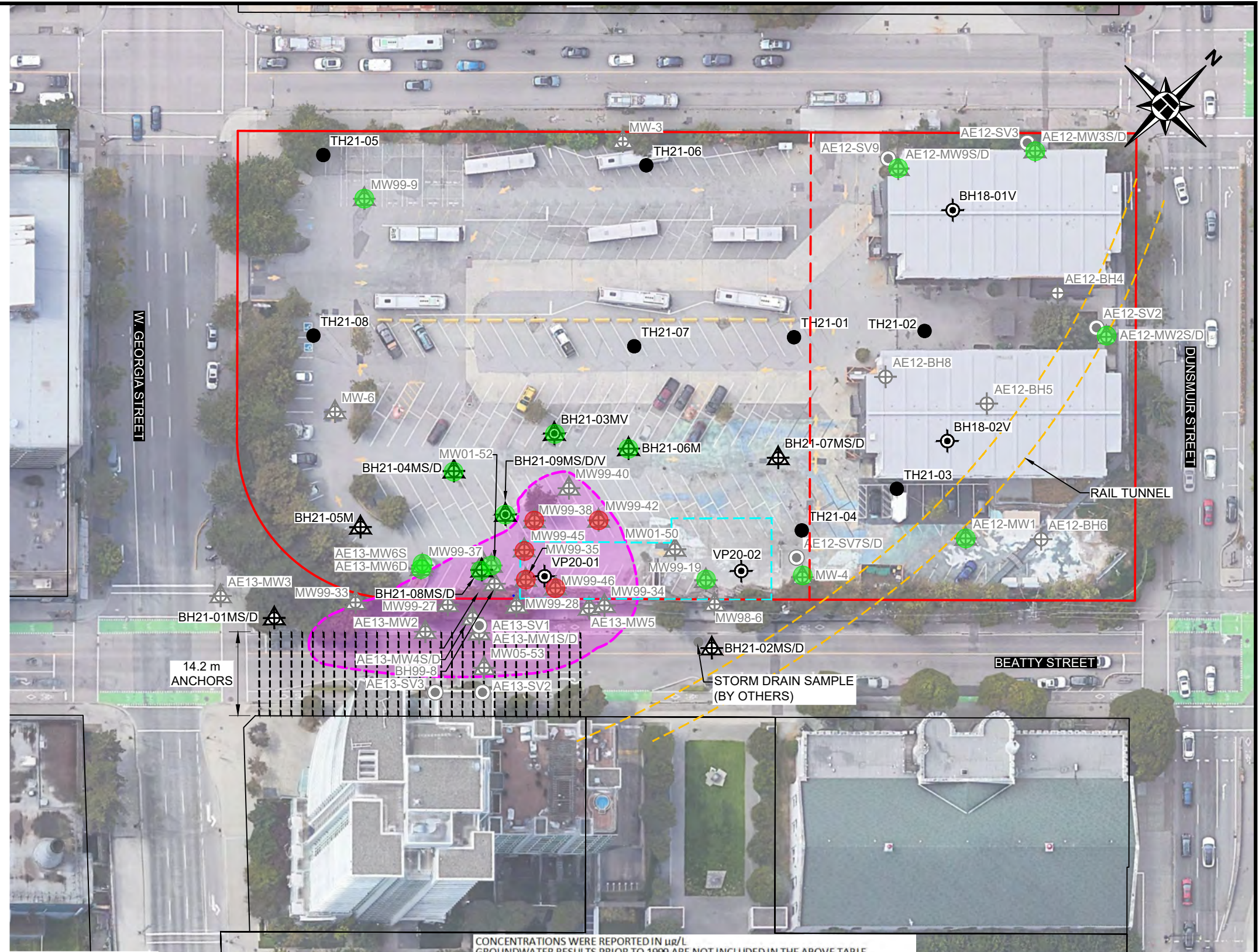
DESIGNED	DRAWN	APPROVED
CM	MOM	
DATE	SCALE	
APR 28, 2022	1:750	
PROJECT No.	FIG. No.	REV.
22720	4C	0





Location	Sample Date	EPH <sub>W10-19</sub>	LEPH <sub>w</sub>	PAH
MW-4	06-Jul-07*	<DL	<DL	-
	28/29-Mar-12	<DL	<DL	<DL
	28-Jul-21	<DL	<DL	<DL
MW99-9	01-Apr-99	-	-	-
	11-Jul-07	<DL	<DL	<DL
	Dup. of Above	<DL	<DL	<DL
MW99-19	28/29-Mar-12	<DL	<DL	<DL
	06-Apr-15	<DL	<DL	<DL
	01-Apr-99	<DL	-	-
MW99-35	23-Jan-21	667,000	667,000	Naphthalene (<69.2), pyrene (<11.6), and several other PAH parameters
	17-Apr-21	4,100,000	4,100,000	Naphthalene (297), pyrene (45.9), and several other PAH parameters
	24-Sep-21	2,350,000	2,350,000	Naphthalene (106), pyrene (20.4), and several other PAH parameters
MW99-38	16-Dec-04*	49,000	49,000	Naphthalene (44) and pyrene (0.7)
	06-Jul-07	9,400	9,400	Naphthalene (37)
	28/29-Mar-12	1,870	1,840	Naphthalene (31.7)
	31-Mar-14	22,300	22,200	Naphthalene (46.4) and pyrene (0.456)
	06-Apr-15	33,000	33,000	Naphthalene (36.6) and pyrene (0.6)
	17/18-Mar-16	1,380	1,310	Naphthalene (71.2)
MW99-42	28-Jul-21	28,600	28,600	Naphthalene (15.1) and pyrene (0.817)
	16-Dec-04*	2,100	2,100	<AWm
	28/29-Mar-12	1,090	1,090	<AWm
	31-Mar-14	960	950	<AWm
	06-Apr-15	2,330	2,320	<AWm
	21-Dec-04*	20,000	20,000	<AWm
MW99-45	06-Jul-07	16,000	16,000	Pyrene (0.6)
	31-Mar-14	2,760	2,750	Naphthalene (14)
	14-May-15	6,360	6,360	Pyrene (0.35)
	17/18-Mar-16	2,930	2,920	<AWm
	17-Nov-20	1,390	1,380	<AWm
	23-Jan-21	2,720	2,720	<AWm
MW99-46	17-Apr-21	602	599	<AWm
	25-Nov-99*	-	-	<AWm
	06-Jul-07	6,600	6,600	<DL
	31-Mar-14	360	360	<AWm
	14-May-15	36,100	36,100	Pyrene (2.7)
	18-Mar-16	2,220	2,220	<AWm
MW01-52	17-Nov-20	<DL	<DL	<DL
	21-Apr-21	3,220	3,220	<AWm
	04-Nov-03*	3,000	3,000	<DL
	15-Dec-04*	<DL	<DL	<DL
	06-Jul-07	260	260	<AWm
	28/29-Mar-12	<DL	<DL	<DL
AE12-MW1	26-Jun-12	<DL	<DL	<DL
	30-May-18	<DL	<DL	<AWm
	26-Jun-12	<DL	<DL	<DL
AE12-MW2D	31-May-18	<DL	<DL	<DL
	26-Jun-12	<DL	<DL	<DL
	Dup. of Above	<DL	<DL	<DL
AE12-MW3S	30-May-18	<DL	<DL	<AWm
	Dup. of Above	<DL	<DL	<AWm
	30-May-18	<DL	<DL	<DL
AE12-MW3D	30-May-18	<DL	<DL	<DL
	26-Jun-12	<DL	<DL	<DL
	30-May-18	<DL	<DL	<DL
AE12-MW9S	26-Jun-12	<DL	<DL	<DL
	30-May-18	<DL	<DL	<DL
	17-Sep-13	470	470	<AWm
AE13-MW6D	20-Apr-15	3,740	3,740	<DL
	11-Aug-21	<DL	<DL	<AWm
	21-Sep-21	<DL	<DL	<AWm
BH21-03M	28-Jul-21	<DL	<DL	<DL
	28-Jul-21	<DL	<DL	<DL
BH21-04MS	Dup. of Above	<DL	<DL	<DL
	28-Jul-21	<DL	<DL	<DL
BH21-04MD	28-Jul-21	<DL	<DL	<DL
	28-Jul-21	<DL	<DL	<DL
BH21-06M	28-Jul-21	<DL	<DL	<DL
	21-Sep-21	<DL	<DL	<DL
BH21-08MS	Dup. of Above	256	256	<DL
	21-Sep-21	<DL	<DL	<DL
BH21-08MD	21-Sep-21	<DL	<DL	<DL
	21-Sep-21	<DL	<DL	<DL

\*Source: Active Earth's April 2014 Report on "Summary of Findings - Off-Site Investigation Along Betty Street."



- NOTES:
1. AERIAL IMAGE TAKEN FROM GOOGLE EARTH.
  2. LOT LINES TAKEN FROM THE CITY OF VANCOUVER OPEN DATA CATALOGUE.
  3. SAMPLING LOCATIONS ARE APPROXIMATE.

LEGEND:

- CONCENTRATIONS ARE BELOW APPLICABLE CSR STANDARDS
- CONCENTRATIONS ARE ABOVE APPLICABLE CSR STANDARDS
- SITE BOUNDARY
- ▲ MONITORING WELL (THURBER 2021)
- ▲ MONITORING WELL WITH NESTED VAPOUR PROBE (THURBER 2021)
- HYDROVAC HOLE (THURBER 2021)
- VAPOUR PROBE (THURBER 2018 / 2020)
- APPROXIMATE EXTENT OF HC CONTAMINATION IN GROUNDWATER
- STORM DRAIN SAMPLE (BY OTHERS)
- BOREHOLE (BY OTHERS)
- ▲ MONITORING WELL (BY OTHERS)
- VAPOUR PROBE (BY OTHERS)

Parameter	CSR AWm Standards (µg/L)
EPH <sub>W10-19</sub>	5,000
LEPH <sub>w</sub>	500
Naphthalene	10
Pyrene	0.2

CONCENTRATIONS WERE REPORTED IN µg/L GROUNDWATER RESULTS PRIOR TO 1999 ARE NOT INCLUDED IN THE ABOVE TABLE

EPH<sub>W10-19</sub> - EPH, UNCORRECTED FOR PAH

LEPH<sub>w</sub> - LIGHT EXTRACTABLE PETROLEUM HYDROCARBONS, CORRECTED FOR PAH

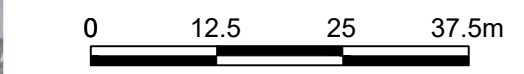
PAH - POLYCYCLIC AROMATIC HYDROCARBONS

CSR - BC CONTAMINATED SITES REGULATION

AWm - CSR GROUNDWATER STANDARDS FOR THE PROTECTION OF MARINE AQUATIC LIFE

<DL - BELOW LABORATORY DETECTION LIMITS

<AWm - BELOW CSR AWm STANDARDS



CLIENT: CITY OF VANCOUVER

688 CAMBIE STREET VANCOUVER, B.C.

DESIGNED	DRAWN	APPROVED
CM	MOM	
DATE	SCALE	
APR 28, 2022	1:750	
PROJECT No.	FIG. No.	REV.
22720	5A	0

Location	Sample Date	VH <sub>w</sub>	VPH <sub>w</sub>	BTEX / BTEXS	MTBE	Fuel VOC	Other VOC
MW-4	06-Jul-07*	<DL	<DL	<DL	-	-	-
	28/29-Mar-12	<DL	<DL	<DL	<DL	-	-
	28-Jul-21	<DL	<DL	<DL	<DL	<AWm	-
MW99-9	01-Apr-99	-	<DL	<AWm	-	-	-
	11-Jul-07	<DL	<DL	<DL	-	-	-
MW99-19	28/29-Mar-12	<DL	<DL	<DL	<DL	-	-
	06-Apr-15	<DL	<DL	<DL	<DL	-	-
	14-Jul-00*	24,000	23,000	Xylenes (590)	-	-	-
MW99-35	15-Dec-04*	36,000	36,000	<AWm	-	-	-
	23-Jan-21	162,000	162,000	<AWm	<DL	<AWm	<DL
	17-Apr-21	<10,000	<10,000	<AWm	<DL	<AWm	-
	24-Sep-21	33,300	33,300	<AWm	<DL	<AWm	<AWm
	16-Dec-04*	240	200	<AWm	-	-	-
MW99-38	06-Jul-07	17,000	17,000	<AWm	-	-	-
	28/29-Mar-12	170	140	<AWm	<DL	-	-
	31-Mar-14	1,020	990	<AWm	<DL	-	-
	06-Apr-15	1,020	1,000	<AWm	<DL	-	-
	17/18-Mar-16	7,250	7,200	<AWm	<DL	-	-
MW99-42	28-Jul-21	502	499	<AWm	<DL	<AWm	-
	16-Dec-04*	180	180	<DL	-	-	-
	28/29-Mar-12	110	110	<DL	<DL	-	-
	Dup. of Above	100	100	<DL	<DL	-	-
	21-Dec-04*	330	270	<AWm	-	-	-
MW99-45	06-Jul-07	550	500	<AWm	-	-	-
	31-Mar-14	390	380	<AWm	<DL	-	-
	14-May-15	250	240	<AWm	<DL	-	-
	17/18-Mar-16	160	160	<AWm	<DL	-	-
	17-Nov-20	<DL	<DL	<AWm	<DL	<AWm	<DL
	23-Jan-21	<DL	<DL	<AWm	<DL	<AWm	<DL
	17-Apr-21	<DL	<DL	<AWm	<DL	<AWm	-
MW99-46	25-Nov-99*	-	-	<AWm	-	-	-
	06-Jul-07	<DL	<DL	<DL	-	-	-
	31-Mar-14	<DL	<DL	<DL	<DL	-	-
	18-Mar-16	110	110	<DL	<DL	<DL	-
	17-Nov-20	<DL	<DL	<DL	<DL	<DL	<DL
MW01-52	23-Jan-21	<DL	<DL	<DL	<DL	<DL	<DL
	21-Apr-21	<DL	<DL	<DL	<DL	<DL	-
	04-Nov-03*	<DL	<DL	<AWm	-	-	-
	15-Dec-04*	<DL	<DL	<AWm	-	-	-
AE12-MW1	06-Jul-07	<DL	<DL	<DL	-	-	-
	28/29-Mar-12	<DL	<DL	<AWm	<DL	-	-
AE12-MW2D	20-Apr-15	<DL	<DL	<DL	<DL	-	-
	30-May-18	<DL	<DL	<DL	<DL	<DL	<DL
AE12-MW3S	26-Jun-12	<DL	<DL	<AWm	-	-	-
	31-May-18	<DL	<DL	<DL	<DL	<DL	<DL
AE12-MW9S	26-Jun-12	<DL	<DL	<DL	<DL	<DL	<DL
	30-May-18	<DL	<DL	<DL	<DL	<DL	<DL
AE13-MW6D	17-Sep-13	<DL	<DL	<AWm	<DL	-	-
	20-Apr-15	250	200	<AWm	<DL	-	-
BH21-03M	28-Jul-21	<DL	<DL	<AWm	<DL	<AWm	-
	28-Jul-21	<DL	<DL	<DL	<DL	<DL	-
BH21-04MS	Dup. of Above	<DL	<DL	<DL	<DL	<DL	-
	28-Jul-21	<DL	<DL	<DL	<DL	<DL	-
BH21-06M	28-Jul-21	<DL	<DL	<DL	<DL	<DL	-
	21-Sep-21	<DL	<DL	<AWm	<DL	<DL	-
BH21-08MS	Dup. of Above	<DL	<DL	<DL	<DL	<AWm	-
	21-Sep-21	<DL	<DL	<DL	<DL	<DL	-
BH21-09MS	21-Sep-21	<DL	<DL	<DL	<DL	<DL	<DL
	21-Sep-21	<DL	<DL	<DL	<DL	<DL	<DL

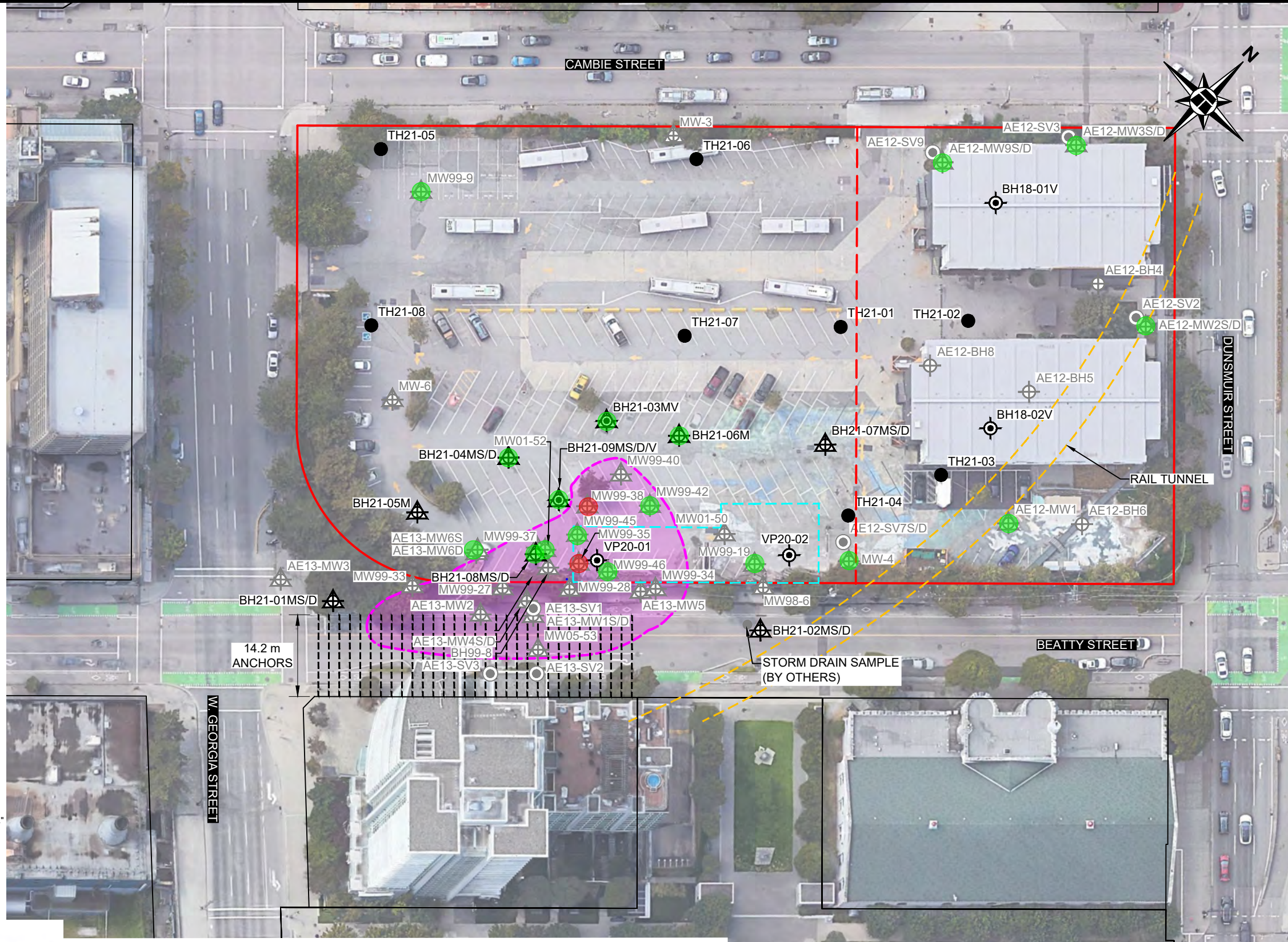
\*Source: Active Earth's April 2014 Report on "Summary of Findings - Off-site Investigation Along Beatty Street."

Parameter	CSR Awm Standards (µg/L)
VH <sub>w</sub>	15,000
VPH <sub>w</sub>	1,500
Xylenes	300

CONCENTRATIONS WERE REPORTED IN µg/L  
 VH<sub>w</sub> - VOLATILE HYDROCARBONS, IN WATER  
 VPH<sub>w</sub> - VOLATILE PETROLEUM HYDROCARBONS, IN WATER  
 BTEX / BTEXS - BENZENE, TOLUENE, ETHYL BENZENE AND XYLENES (PRE 2000 DATA) / BENZENE, TOLUENE, ETHYL BENZENE, XYLENES AND STYRENE  
 MTBE - METHYL TERT-BUTYL ETHER  
 VOC - VOLATILE ORGANIC COMPOUNDS  
 CSR - BC CONTAMINATED SITES REGULATION  
 Awm - CSR GROUNDWATER STANDARDS FOR THE PROTECTION OF MARINE AQUATIC LIFE  
 <DL - BELOW LABORATORY DETECTION LIMITS  
 <AWm - BELOW CSR Awm STANDARDS

**LEGEND:**

- SITE BOUNDARY
- MONITORING WELL (THURBER 2021)
- MONITORING WELL WITH NESTED VAPOUR PROBE (THURBER 2021)
- HYDROVAC HOLE (THURBER 2021)
- VAPOUR PROBE (THURBER 2018 / 2020) APPROXIMATE EXTENT OF HC CONTAMINATION IN GROUNDWATER
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 <b>THURBER ENGINEERING LTD.</b>	CLIENT <b>CITY OF VANCOUVER</b>	DESIGNED <b>CM</b>	DRAWN <b>MOM</b>	APPROVED
	<b>GROUNDWATER ANALYTICAL RESULTS</b> <b>VH, VPH AND VOC (ON-SITE)</b>	DATE <b>APR 28, 2022</b>	SCALE <b>1:750</b>	
688 CAMBIE STREET	VANCOUVER, B.C.	PROJECT No. <b>22720</b>	FIG. No. <b>5C</b>	REV. <b>0</b>