VIA EMAIL ONLY

File: 26250-20/9979
Site ID: 9979

March 19, 2021

Eileen Fu
0839879 BC Ltd.
8417 Main Street
Vancouver, BC V5X 3M3

eileen@createproperties.ca

Dear Eileen Fu,

Re: Contaminated Sites Services Application
Director's Preapproval under Protocol 6
180 East 2nd Street, Vancouver, BC (PID: 030-275-768)

I am writing further to the Contaminated Sites Services Application ("Application") referenced above. Specifically, the Application seeks the director's preapproval to not delineate, beyond the subject property, the extent of soil contamination which has resulted from the placement of contaminated fill from multiple widespread and undetermined historical sources with no identified responsible person or that has been identified as wide-area contamination.

Attached to this letter is a summary of the ministry's review and assessment of the Application. The ministry reviewer is in general agreement with information provided, and assertions made, regarding contaminated fill encountered at the site, as documented more fully in the attached memo.

I have considered the opinions of the ministry reviewer and find them a suitable basis for granting the requested preapproval under the authority of Protocol 6 (Applications with Approved Professional Recommendations and Preapprovals).

This decision does not constitute review or acceptance by the director of any other aspect of the investigations and remediation conducted, or planned for, at the site.

Please be advised that this decision is based on the most recent information provided to the ministry regarding the site. The ministry, however, makes no representation or warranty as to the

accuracy or completeness of that information. The ministry expressly reserves the right to change or substitute different requirements where circumstances warrant.

Please ensure that a copy of this letter is included with any future application for an approval in principle or certificate of compliance under the professional reliance process.

If you have any questions about this decision letter, please contact Stephen.Dankevy@gov.bc.ca or the undersigned at Alan.McCammon@gov.bc.ca.

Yours truly,

Alan W. McCammon
for Director, *Environmental Management Act*

attach: Ministry review and assessment memo dated March 19, 2021

cc: Madeleine Doherty, Thurber Engineering Ltd. mdoherty@thurber.ca
Steve Dankevy, ENV Stephen.Dankevy@gov.bc.ca
Client Information Officer, ENV csp_cio@gov.bc.ca
CSAP Society c/o apopova@csapsociety.bc.ca

Memorandum

Ministry of Environment and Climate Change Strategy
Environmental Emergencies and Land Remediation Branch

March 19, 2021

File No.: 26250-20/9979
SITE ID: 9979

To: Alan McCammon
Delegate of Director, *Environmental Management Act*

From: Steve Dankevy
Senior Contaminated Sites Officer

Re: **Application Review and Assessment - Protocol 6 Preapproval**
180 East 2nd Street, Vancouver, BC

1.0 **Introduction**

EMA sections 42 and 64 provide authority to establish Protocol 6 - Applications with Approved Professional Recommendations and Preapprovals, Version 11.0 (Protocol 6). The request for this preapproval is sought under Sections 4.0 of Protocol 6 – Eligibility of Applications for Review by Approved Professionals – and has been reviewed and assessed in comparison to the applicable protocol and in conjunction with ministry policies, website and guidance. It is necessary to apply for preapproval under Protocol 6 when an Approved Professional intends to make a recommendation to the director for the issuance of a Determination, Approval in Principle or a Certificate of Compliance and the application will not include the entire extent of contamination.

An application for services related to the above referenced property (the "Site") was received by the ministry on February 18, 2021 for a preapproval to not delineate the entire extent of soil contamination based the placement of contaminated fill from multiple widespread and undetermined historical sources with no identified responsible person or that has been identified as wide-area contamination. This scenario requires a Protocol 6 preapproval as referenced in the Preapprovals webpage on the ministry's website. I have reviewed the following letter report in support of the preapproval request:

> *RE: REQUEST FOR PREAPPROVAL NOT TO DELINEATE WIDESPREAD FILL,* 180 E 2nd Avenue, Vancouver, BC, PID: 030-275-768, SITE ID 9979, Prepared by Thurber Engineering Ltd. (Thurber) and dated February 8, 2021.

2.0 **Background**

The Site is located in Vancouver in an area known as the False Creek Flats. The land use in this area is mixed consisting of commercial, industrial, residential uses. The Site location is presented in Figure 1.

The Legal Description is as follows:

Lot 1 Block 14 district Lot 200A Group 1, New Westminster District Plan EEP53535

The Site is located in an area which is known to have received imported fill of poor quality during the infilling of False Creek. The site was occupied by three commercial buildings prior to 2018. The northern building was historically occupied by commercial enterprises including an oil and battery operation in the 1940s. The northeastern building was occupied by the Army,

Figure 1. Site Location

Navy and Air Force Veterans Association and then Maynard's Auction House. The southern building was occupied by apartments and at-grade commercial retail use, including at-grade parking lots. The buildings were demolished in 2018 and the site is being redeveloped into a mid-rise apartment building with at-grade commercial use and five levels of underground parking.

3.0 **Applicant's Rationale to Not Delineate**

Historical Maps and Environmental Report Review

Thurber reviewed historical geology maps and fire insurance plans for the Site and immediate False Creek vicinity. On-Site environmental reports and available environmental reports in the vicinity of the Site were also reviewed to assess the fill quality of nearby properties for comparison to the Site.

The surficial geology map (Map 1486A, 1980) indicates that the area located 150 m northeast and northwest of the Site was formerly part of False Creek and is now underlain by "Landfill including sand, gravel, till, crushed stone, and refuse".

The 1901 Fire Insurance Plan (FIP) shows the original waterline of False Creek, which was located as close as 130 m to the northwest, approximately one block north of the Site. By 1912, the FIP shows filling had already begun and by 1940, the area located to the east of Main Street was filled completely. Thurber reported that historical records indicated filling occurred in 1917 for construction of the rail terminal. These records do not indicate that filling occurred on the Site; however, Thurber asserts that the Site was near the original shoreline which was undulating with variable topography, and that filling would have been necessary to level the Site prior to development, which is consistent with soil conditions observed on the Site during excavation works. Thurber's assertion seems reasonable.

Several site investigations have been conducted at the site. Trow Associates (Trow) completed investigations between 2004 and 2007. Thurber completed further investigations and remediation between 2017 and 2020.

The stratigraphy on the Site was described as follows:

- Unit 1: Surficial Fill generally between 0.5 and 2 m thick, consisting of fine to coarse sand and gravel with brick, metal, glass and wood debris. During both recent and historical excavation at the Site, this fill was observed to be generally poor quality. This layer was present on the northern half of the property, reducing in depth with increasing elevation to the south.
- Unit 2: Silt and clay, between 1 and 2 m thick. Only observed in holes in the northern part of the investigated area.
- Unit 3: Sand, silt and gravel (till-like in some areas), 4.5 to 6 m thick throughout the Site.
- Unit 4: Weathered sandstone bedrock at depths of approximatively 6 m, where observed in the northern part of the Site, and between 4.5 and 6 m in the southern part of the Site.

The following Areas of Environmental Concern (AEC)/Contaminants of Concern (COC) were identified:

APEC #	Description	PCOCs		
		Soil	Groundwater	Soil Vapour
		On-Site		
1	Former on-Site oil and battery storage in north part of Site.	LEPH, HEPH, PAH, VPH, VOC, metals	LEPH, EPH_{10-19}, PAH, VPH, VOC, dissolved metals	VOC, VPH
2	Poor quality fill from unknown historical sources	LEPH, HEPH, PAH and metals	LEPH, EPH_{10-19}, PAH, and dissolved metals	Naphthalene
		Off-Site		
3	Various auto repair, manufacturing, printing and machine shops to south, southeast and southwest	LEPH, HEPH, PAH, VPH, VOC, metals	LEPH, EPH_{10-19}, PAH, VPH, VOC, dissolved metals	VOC, VPH

LEPH – light extractable petroleum hydrocarbons
HEPH – heavy extractable petroleum hydrocarbons
EPH – extractable petroleum hydrocarbons
PAH - polycyclic aromatic hydrocarbons
VPH – volatile petroleum hydrocarbons
VOC – volatile organic compounds.

Contamination related to AEC 1 was delineated and remediation during various investigations completed from 2006 to 2018. This contamination extended offsite onto the roadway and was defined by an off-Site Management Area (OMA), which was also delineated and excavated in 2006. Contamination related to AEC 2 was delineated and excavated on-Site, but not off-Site. The off-Site delineation is the subject of this preapproval.

Fill Material Identification on Neighbouring Sites

Several other contaminated sites located in the vicinity are known to have been affected by wide scale infilling with poor quality fill. Thurber reviewed site investigation reports for several sites to ascertain if the fill material encountered on the Site is similar to fill material on these nearby sites. Figure 2 shows the location of these sites.

<u>SITE ID 1364: 1785 Main Street (30 m north of the Site)</u>
This property has operated as a gas station since circa 1940. Concrete debris, brick and wood were noted in the eastern, western and southern portions of the Site. Lead was found to be elevated in the soil samples.

SITE ID 18758: 101 East 2nd Avenue (35 m northwest of the Site)
This property was an amalgamation of several lots. The only AEC, other than fill material, noted was a UST located in the northwest corner of the property. The report cited poor quality fill in the borehole logs consisting of wood, waste, metal and bricks. Soil analytical results included elevated concentrations of copper, barium, lead cadmium, zinc and PAHs in shallow soils. A Protocol 6 preapproval to not delineate contamination on this site was received in 2017.

SITE ID 10843: 188 East 1st Avenue (75 m north of the Site)
This property had historical automotive uses at the site. The borehole logs indicated shallow fill material contained brick, ash, metal and wood. Metals (antimony, arsenic, barium, cadmium, chromium, copper, lead, tin and zinc) contamination were identified in shallow soils in addition to sporadic HEPH, LEPH and PAHs. The contaminant profiles indicated that contaminants in the fill were consistent with four neighboring sites. Groundwater also contained elevated PAHs that was attributed to the poor fill quality. A Protocol 6 approval was issued for this site in 2009 based on wide area contamination scenario.

SITE ID 12675: 104-150 East 1st Avenue (75 m northwest of the Site)
This site had automobile repair, towing, junkyard and welding related historical activities. A UST was the only AEC identified. No description of the fill material was provided but the soil had metals and PAH contamination similar to neighboring sites. A Protocol 6 approval was issued for this site, based on wide area contamination scenario in 2009.

SITE ID 22433: 220 East 1st Avenue (80 m northwest of the Site)
This site was occupied by Ralph's Radio. The borehole logs indicated brick and metal debris and contamination consisted of metals in soil and PAHs in groundwater.

SITE ID 8941: 1695 Main Street (135 m north of the Site)
This property was previously a restaurant and asphalt plant. The borehole logs indicated fill thicknesses from 1 to 4 m containing brick and wood debris. Soil contamination identified included LEPH, HEPH, PAH and metals. Some of the PAHs were attributed to the asphalt plant.

No SITE ID: 1620-1658 Main Street (220 m north)
Site investigation conducted in 2008 was contained in reports related to SITE ID 10843. The site was formerly occupied by an automotive business. Results indicated that shallow fill material contained LEPH and metals above applicable standards. Groundwater also contained PAHs above CSR AW standards.

SITE ID 3976: 285 East 1st Avenue (225 m east)
This site had historical operations including warehouses, transportation companies, equipment sales, commercial bus operations and a cardlock. Investigations resulted in a wide area contamination approval from the ministry in 2011. Fill material had widespread contamination with metals and minor contamination with hydrocarbons associated with a former UST. Groundwater contamination with metals and PAHs was also identified.

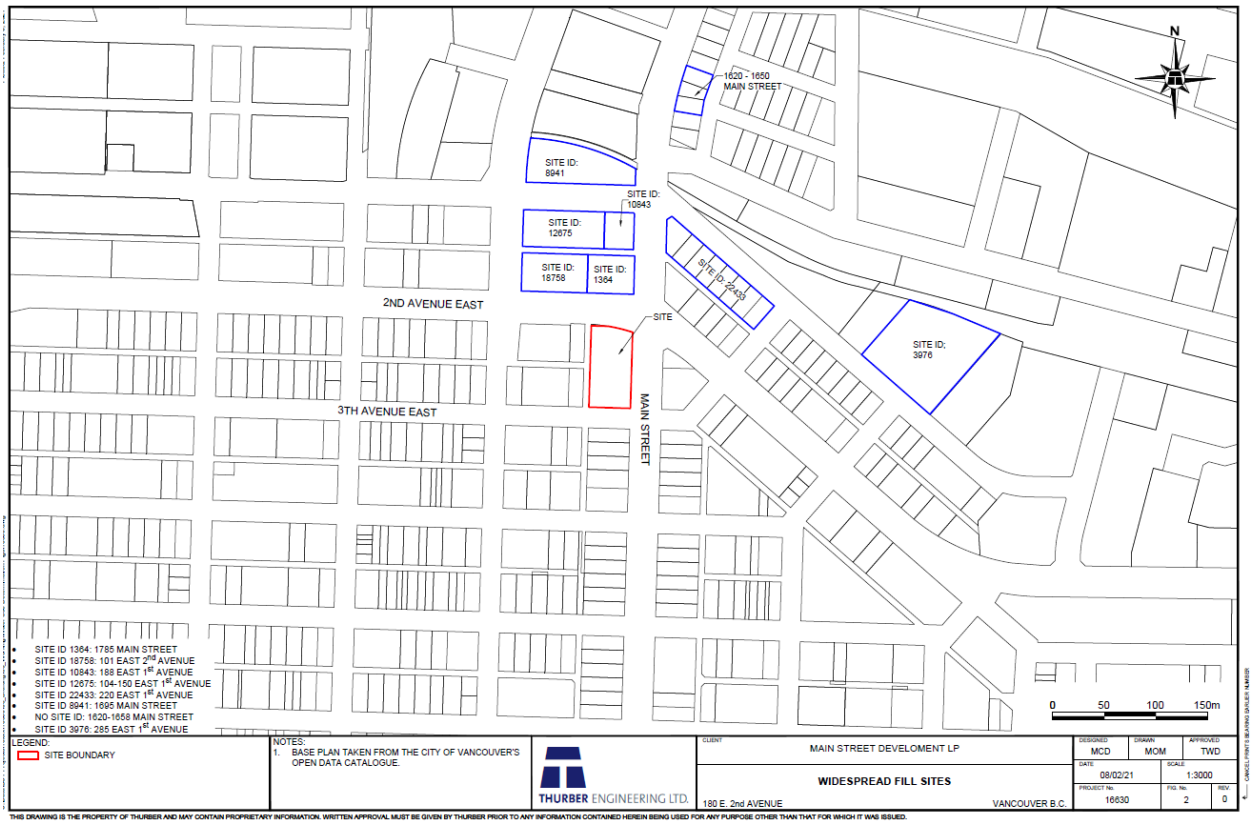

Figure 2. Nearby Site Locations with Poor Imported Fill Quality

Thurber provided a summary of contaminant profiles for soil and groundwater of the neighboring sites for metals and PAHs to assess the similarity of the Site contamination with the wide area contamination known to be present in the False Creek area. Parameters in the following table exceeded CSR CL standards.

Site / Contaminant	SITE	Site ID 3976	Site ID 8941	1620-1658 Main St	Site ID 10843	Site ID 12675	Site ID 18758	Site ID 22433
Antimony	X	X			X	X		
Arsenic	X	X	X		X	X	X	X
Barium	-				X	-	X	
Cadmium	X	X	X		X	X	X	X
Chromium	-	X	X	X	X	X		
Copper	X	X	X	X	X	X	X	
Lead	X	X	X		X	X	X	X
Tin	X	X	X		X	X		
Zinc	X	X	X	X	X	X	X	X
Benz(a)anthracene	X		X		X			Unknown, not tested
Benzo(a)pyrene			X		X			
Benzo(b)fluoranthene	X		X		X			
Benzo(g,h,i)perylene					X			
Benzo(k)fluoranthene					X			
Dibenz(a,h)anthracene			X					
Indeno(1,2,3-c,d)pyrene	X		X		X			
Phenanthrene	X		X		X			
Pyrene			X		X			

Similarly, contaminant profiles for PAHs in groundwater above CSR AW standards are presented in the following table.

Site ID Contaminant	SITE	Site ID 3976	Site ID 8941	1620-1658 Main St	Site ID 10843	Site ID 22433
Acridine	X		X			
Anthracene		X			X	X
Benzo(a)anthracene	X	X			X	X
Benzo(a)pyrene	X	X	X	X	X	X
Chrysene	X	X			X	
Fluoranthene	X	X	X		X	X
Naphthalene		X	X			
Phenanthrene		X			X	X
Pyrene	X	X	X	X	X	X

Thurber noted that benzo(a)pyrene and pyrene were consistently identified in the neighboring sites and attributed to poor quality fill.

Based on the information summarized above Thurber has provided the following rationale for supporting a wide area contamination scenario preapproval:

- *"Although the Site is outside the former False Creek water line, our review of available reports for properties in the surrounding area (including others outside the False Creek water line) indicates a shallow layer of poor quality fill is present throughout the area."*
- *"The fill layer appears to increase in depth towards the north, pinching out at the middle of the Site with the increasing natural grade."*
- *"Metal, brick and wood debris was observed in this fill material both on-Site and on nearby properties."*
- *"The fill material is of variable quality; however, metals contamination in the soil appears to be widespread."*
- *"As evidenced by the reviewed reports, contaminated soil and groundwater was also identified at nearby properties and attributed to poor-quality fill to the east, north and northwest with similar contaminants as the Site."*
- *"Given the fill was likely placed between 1890 and 1920, there are no identified responsible persons for the widespread contamination."*
- *"The owner or operator did not, by any act or omission, cause or contribute to or exacerbate the widespread historical contamination. Operations at the Site included an apartment building, Bank of Nova Scotia, a veteran's association an auction house. Various other small retail operations have been present since development. An oil and battery storage facility (AEC 1) resulted in hydrocarbon contamination at the Site extending into an OMA beneath the adjacent City roadway. However, the soil and groundwater contamination related to AEC 1 was remediation on-Site and in the OMA in 2006. All on-Site contamination related to AEC 2 was remediated in 2006 and 2018 during the Site's redevelopment. There is no reason to suspect that the owners caused, contributed to, or exacerbated the widespread historical contamination."*

4.0 **Reviewer's Assessment of Application and Conclusion**

The reviewer's assessment of the preapproval to not delineate contamination caused by the placement of contaminated fill from multiple widespread and undetermined historical sources with no identified responsible person or that has been identified as wide-area contamination is provided below. Based on the information and rationale for the preapproval in the submitted application, I agree with the following:

1. The Site investigations identified two AECs. AEC1 is related to a UST source of contamination which was investigated and remediated and AEC2 relates to contaminated imported fill which was remediated on the Site and in the OMA.
2. Thurber's assessment and conclusion that the Site has received imported fill of poor quality during the infilling of False Creek circa 1890 to 1920s.
3. Thurber identified several sites in the vicinity which have also received imported fill contaminated with metals and PAHs.
4. The contaminant profiles from nearby sites indicate that individual metals and PAH monomers are present in varying degrees in the soil and groundwater in the imported fill material. This is consistent with wide area contamination of fill in the False Creek area.
5. Several of these nearby sites have received Protocol 6 preapprovals from the ministry to not delineate the contaminated fill material based on a wide area contamination scenario.
6. There are no identified responsible persons for placement of the contaminated fill material, and the owner has not added or exacerbated to contamination of the fill material.

The request for this preapproval has been reviewed and assessed in comparison to Protocol 6 and in conjunction with ministry policies, website and guidance. In conclusion, it is my opinion that the preapproval application is complete and provides satisfactory rationale for the director to consider granting the requested preapproval to not delineate the contaminated fill material beyond the Site.

Stephen Dankevy, M.Sc., P.Geo.
Senior Contaminated Sites Officer