



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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January 12, 2010

Mr. Stephen L. Anderson  
Deputy City Manager  
City of Bothell  
18305 101st Avenue NE  
Bothell, WA 98011

**Re: Site Recommendations and Review of Report of Investigation, Feasibility Study, and Draft Cleanup Action Plan under WAC 173-340-350 and -355 for the following Hazardous Waste Site:**

- Site Name: BOTHELL LANDING
- Site Address: 18120, 18132, and 18126 Bothell Way NE, Bothell 98011  
10001 Woodinville Dr., Bothell 98011
- County Assessor's Parcel Numbers 3945720-0015 and 945720-0020
- Facility/Site No.: 73975762
- Agreed Order No.: 6294

Dear Mr. Anderson:

Thank you for submitting your draft Report of Investigation/Feasibility Study (RI/FS) and Draft Cleanup Action Plan (DCAP) for the above mentioned site. Ecology appreciates your initiative under the Model Toxics Control Act.

The Washington State Department of Ecology's Toxics Cleanup Program has reviewed the following information regarding the BOTHELL LANDING site, generally located at 18120, 18132, and 18126 Bothell Way NE, and 10001 Woodinville Dr., Bothell 98011:

1. Bothell Landing Remedial Investigation/Feasibility Study, Revision No. 1, prepared by Parametrix, dated December 2009.
2. Bothell Landing Draft Cleanup Action Plan Revision No. 1, prepared by Parametrix, dated December 2009.

The report listed above will be kept in the Central Files of the Northwest Regional Office (NWRO) of Ecology for review by appointment only. Appointments can be made by calling Sally Perkins at the NWRO at (425) 649-7190.



The Department of Ecology has reviewed the documents and is providing the following technical, regulatory, and administrative comments:

### **Regulatory and Administrative Comments**

1. Based on the Report of Investigation/Feasibility Study (RI/FS) report, Draft Cleanup Action Plan (DCAP), and supporting environmental reports, the remedial approach for petroleum hydrocarbon contaminated soil remediation specified in the DCAP should be implemented as an interim remedial action. Ecology will work with you to amend Agreed Order DE 6294 and carry out the public comment requirements required by the Model Toxics Control Act for the amendment combined with SEPA requirements for the interim action. This will be implemented before or during the Crossroads Development construction schedule planned for the first quarter of 2010.
2. Other Potentially Liable Parties (PLPs) will be included in the Agreed Order due to commingled Halogenated Volatile Organic Compound (HVOC) plumes from upgradient releases. List all relevant sources if they are believed to have contributed to site contamination based on commingling contaminant plumes or infringing footprints (e.g., Bothell Service Center/Simon & Son Fine Dry Cleaning, Wexler Property/Al's Auto Supply, Speedy Auto Glass/Bob's Bothell Mobil, Ultra Custom Cleaners/Coin Op Speed Wash, AARENCO/Hertz Rentals (downgradient)).
3. The boundaries of the site and the scope of investigation will be adjusted accordingly.
4. The Agreed Order will remain open until such time that the groundwater impacts and residual, known, or unknown contamination issues in soil and groundwater are addressed further as supplemental investigations and in the feasibility study.
5. Based on review and assessment of the sufficiency of the draft RI/FS, Ecology recommends implementing as an interim action the soil remediation under Alternative 3 (Excavation and Offsite disposal) for petroleum hydrocarbon contaminated soil the northern portion of the site, without leaving residual contamination above Method A or B cleanup levels.
6. Work plans for the interim action(s) will be integrated as deliverables or supporting documents in the agreed order amendment. The work plans should be submitted for Ecology approval as soon as possible in order to meet the requirements for public involvement and the time window for cleanup within the construction schedule for the City's Crossroads redevelopment project.

### **Technical Comments**

1. Figure 1-2 should include upgradient contaminated sites that may have commingled contaminant plumes in groundwater or extended soil impacts.
2. The nature and extent of off-site contaminant source interactions have not been identified or evaluated with respect to this site (chiefly Total Petroleum Hydrocarbons or TPH and Halogenated Volatile Organic Compounds or HVOCs).
3. Page 2-3, 5<sup>th</sup> paragraph, the two service stations had been located at the northeastern corner of the site. Is the other station at the northwestern corner?
4. Page 2-4, second paragraph: It should be explicitly stated that the TPH and HVOC plumes have commingled at the site.

5. Original work plan called for sampling MW-2. Although MW-2 was found in the RI to be unusable, this remains as a data gap especially since groundwater samples in MW-2 recorded many of the historical VOC exceedances in the site. Ecology suggests reinstalling another well at this location.
6. Page 3-3, third bullet: Ecology recommends using Method B cleanup levels and not background metals due to end use at the property, unless it can be demonstrated that this is the more appropriate cleanup level.
7. Page 3-3, under 3.1.7.1 Petroleum Hydrocarbons (including BTEX): horizontal extent of petroleum impacted soil may extend beneath buildings and across the right of way. A plan should be put in place if this is encountered and if more characterization is needed.
8. Extractable Petroleum Hydrocarbons/Volatile Aromatic Petroleum Fraction (EPH/VPH) analysis is recommended to determine using the three phase model the appropriate cleanup levels for oil range hydrocarbons that are protective of groundwater.
9. BLMW-3 is not identified on site maps.
10. Footprint of petroleum hydrocarbon impacted soil may extend further to the northeast and east. Is the delineation of lateral and vertical extent complete?
11. Page 3-3, last paragraph: Report states that the extent of gasoline and oil range petroleum contamination in soil was not delineated in the study but appears to be limited. There is no evidence provided on its limited extent. The nature and extent of petroleum hydrocarbon contamination in groundwater in this area of the site remains uncertain and is a data gap in the RI. Free product in well BZ-7 at the adjacent Hertz property to the west is sufficiently close to expect its extension (free phase or dissolved) onto the Bothell Landing site (probably to its west-central sector) due to proximity and groundwater flow direction.
12. A Terrestrial Ecological Evaluation as per WAC 173-340-7490 should be included in the RI/FS.
13. Page 3-4: Exceedances for barium and lead were not investigated further. Instead, the RI states that the future SR 522 alignment will be located above the area (BH-13 and BH-14) that will eliminate the ecological pathway. Ecology cannot conclude based on this description if the risks have been eliminated, a cleanup action will be planned, or if compliance will be reached. These metals will remain a contaminant of concern at this site and should be characterized and remediated. Inasmuch as the planned SR 522 will cover this area, Ecology recommends that the metals characterization and remediation be implemented before the construction, presumably as part of the petroleum hydrocarbon soil remediation that is being planned as an interim action at the northern portion of the site.
14. Page 3-4, under 3.1.8.1 Petroleum Hydrocarbons (including BTEX): Report in figures the results for TPH-Dx (diesel, oil) for soil and groundwater. Identify if cleanup levels were exceeded.
15. Page 3-5, under 3.1.8.2 HVOCs: What properties are the upgradient HVOC sources? Where are they traceable to?
16. Page 3-5, under 3.1.8.2 HVOCs, second paragraph: Figure 3-3 does not show HVOC concentrations from RI and CDM study.

17. Page 3-5, 3.1.8.3 Metals: Assess all metals that are potential contaminants of concern from RI and previous investigations (e.g., Lead, Cadmium), especially at the southern portion of the site.
18. Page 3-6, Primary Sources of Contamination and Primary Release Mechanisms: Primary contaminants associated with the former gasoline station may include metals such as Lead and PAHs.
19. Page 3-6: Soil Vapor and Vapor intrusion chiefly from HVOCs is a recognized risk in the report. Investigation and mitigation of this risk has not been addressed. This potential risk will exist during the Crossroads Redevelopment project and post-project when retail buildings or pedestrian traffic, landscaped areas, and parks are built above areas where HVOC plumes exist or HVOC contaminated soil remains.
20. Page 3-9, under Cleanup Levels Selection: Ecology recommends risk based cleanup levels (Method B) rather than using background concentrations for metals in soils.
21. Chosen sample areas for groundwater near Horse Creek were located further away in the RI than originally planned. It is not clear if impacts or interaction from Horse Creek's Mystery contamination are significant.
22. Occurrence and risks from contaminated groundwater discharge to surface water have not been evaluated.
23. Page 4-11, under 4. Feasibility Study, third paragraph: PCE/TCE and related contamination in groundwater plumes from upgradient solvent sites does not constitute area background. Due to commingling with site TPH plumes (and metals), the site boundary has changed and source remediation is necessary along with further characterization of the nature and extent of these sources. Therefore, the RI/FS must remain open until these data gaps are addressed.
24. Page 4-12, 4.5.1 Screening Criteria, first bullet: subsurface soil point of compliance is 0 to 15 feet (therefore screening criteria should go beyond 10 feet).
25. Page 4-12, 4.5.1 Screening Criteria, second bullet: contaminants should include metals in soil and groundwater where they have been identified to be above MTCA cleanup levels (such as Lead, Chromium, Cadmium in groundwater; Cadmium in soil) and HVOCs where they occur in groundwater and as vapor intrusion risks.
26. Page 4-13, 4.5.3 Technologies Retained for Further Screening: additional technologies should be considered for groundwater remediation of TPH and HVOCs.
27. Page 4-14, under Alternative 1 description: Monitored Natural Attenuation or MNA as described does not follow the Ecology guidance for natural attenuation of dissolved petroleum hydrocarbons in groundwater. MNA is not a No Action Alternative. Discussion should use the Ecology guidelines. The vapor intrusion evaluation should be part of the RI requirements rather than being mentioned without a specific plan or schedule. Park areas created after road alignment may expose contaminated soil.
28. Page 4-15, under Alternative 2 Description: It is not clear what contaminant of concern will be remediated by Oxygen Release Compound or ORC. Effectiveness and dosing will still require treatability testing.
29. Page 4-15, 3<sup>rd</sup> paragraph confirmation soil samples taken concurrently with mixing may be too soon as sufficient chemical reaction may not have been reached in order to demonstrate lower contaminant concentrations.

30. Page 4-15, last paragraph: Limits of removal are open ended with uncertain outcomes on achieving compliance with cleanup levels and thus protectiveness and permanence of the cleanup. Technically, the RI should sufficiently delineate the lateral and vertical extent of soil contamination in order to avoid the uncertainty over limits of soil removal. No contingency plans or alternative corrective or additional remedial action are offered if residual contamination remains.
31. Page 4-16, second paragraph: excavation dewatering may involve HVOCs (Perchloroethylene or PCE, Trichloroethylene or TCE, Vinyl Chloride or VC) removal and safe disposal.
32. Page 4-14, 4<sup>th</sup> paragraph: it is not clear what contaminant in groundwater is being described.
33. Page 4-16, 5<sup>th</sup> paragraph: a soil vapor evaluation should be a part of the RI.
34. Page 4-18, second paragraph: alternatives 2 and 3 do not offer permanent solutions to remediation of groundwater due to remaining contaminant sources, especially for HVOCs. All three alternatives require institutional controls to address residual contamination; therefore, they are not indicative of achieving a permanent solution.
35. Metals in soil at the southern part of the property do not appear to have been sufficiently characterized and are not incorporated in the FS or DCAP.
36. Metals in groundwater (arsenic, chromium, cadmium, barium, and lead, for example) do not appear to have been addressed in the FS and DCAP.
37. Figure 20-1: Extent of contamination beneath buildings remains unknown (Petroleum contaminated soils, HVOC plumes, etc.).
38. Table 3-2: TPH-Dx should be reported in the table and in associated figure. Data for MW-2 should be provided to understand contaminant impact at this location.
39. Table 4-1: technologies should be reassessed for remediation of HVOC and metals in identified media at the site.
40. Table 4-2: 1. MNA is not appropriate as described. 2. In Situ ORC application is temporary as upgradient source control or removal is not being addressed. Table should include importing clean fill for appropriate redeveloped areas, vapor intrusion investigation, and addressing soil contaminated with metals.
41. Due to past SVOC hits in soil from historical investigations (also mentioned in section 3.1.7.2 Naphthalenes), and prevalence of motor and/or waste oil in soil and groundwater, SVOCs (see 1-Methylnaphthalene and 2-Methylnaphthalene in BH-3) including cPAHs. PCBs should also be screened in soil. If past investigations have adequately investigated the nature and extent of these contaminants, this should be adequately described in the appropriate section and depicted in maps to show that sample coverage was sufficient.
42. Due to the Crossroads redevelopment schedule, if additional field investigations are necessary to address data gaps in the RI/FS, Ecology believes that the best time would be before the redevelopment and highway alignments/construction. This characterization work and possibly additional cleanup actions are best included in the work plans for the interim action(s).

### **Draft Cleanup Action Plan**

1. Ecology recommends that the excavation and removal of petroleum contaminated soil be implemented as an interim action.

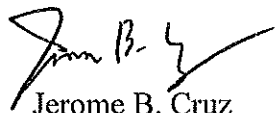
2. Complete source removal (petroleum contaminated soil, metals contaminated soil, etc.) should be achieved as much as possible throughout the site.
3. Remediation of groundwater contamination will require adequate characterization of plumes on the site throughout their full extents as well as their soil sources for the HVOC plumes.
4. Page 5-1: The existing and two proposed monitoring wells within the parcel boundary are roughly located along a line and thus cannot be used to determine groundwater gradient and direction. MW-2 should be replaced in order to monitor dissolved groundwater contamination previously known at this location. No coverage rationale is provided for the proposed spread of wells.
5. The technology involving Oxygen Release Compound or ORC to remediate the petroleum hydrocarbon plume is uncertain, as is the delivery system and zone of treatment. A bench scale treatability study will need to be part of the FS.
6. Vapor intrusion studies should be carried out as part of the RI/FS, chiefly due to the risk from HVOC plumes at the site.
7. Ecology will work with the City of Bothell on appropriate groundwater remediation alternatives.

Please note that this opinion is based solely on the information contained in the documents listed above. Therefore, if any of the information contained in those documents is materially false or misleading, then this opinion will automatically be rendered null and void.

The state, Ecology, and its officers and employees make no guarantees or assurances by providing this opinion, and no cause of action against the state, Ecology, its officers or employees may arise from any act or omission in providing this opinion.

Again, Ecology appreciates your initiative in conducting remedial action under an Agreed Order. If you have any questions you may reach me at 425-648-7094.

Sincerely,



Jerome B. Cruz  
Hydrogeologist 4  
NWRO - Toxic Cleanup Program

jc/kp

cc: Steven Morikawa, City of Bothell Capital Program Manager  
Nduta Mbuthia, City of Bothell, Project Engineer