Exhibit B

Cleanup Action Plan

SemMaterials LP Spokane

4327 N Thor St, Spokane, WA 99217

Toxics Cleanup Program

Washington State Department of Ecology
Spokane, Washington

August 2024

Publication Information

This document is an attachment (Exhibit B) to the Consent Decree for the SemMaterials LP Spokane Site, available on the Washington State Department of Ecology's SemMaterials LP Spokane cleanup site page.[1]

Related Information

- Cleanup site ID: 3229
- Facility site ID: 16655424

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[1] https://apps.ecology.wa.gov/cleanupsearch/site/3229
[2] www.ecology.wa.gov/contact

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Acronyms and Abbreviations

ARAR – applicable, relevant, and appropriate requirement

AST – aboveground storage tank

bgs – below ground surface

BNSF – BNSF Railway Company

CAP – Cleanup Action Plan

cPAHs – carcinogenic polycylic aromatic hydrocarbons

CUL – cleanup level

DCA – disproportionate cost analysis

DRPH – diesel-range petroleum hydrocarbon

Ecology – Washington State Department of Ecology

ft/ft – feet per foot

IHS – indicator hazardous substance

Koch – Koch Materials, LLC

Marathon – Marathon Oil Company

MTCA – Model Toxics Control Act

NSC – North Spokane Corridor

ORPH – oil-range petroleum hydrocarbon

PAHs – polycyclic aromatic hydrocarbons

PLP – potentially liable person

RCW – Revised Code of Washington

RI/FS – remedial investigation/feasibility study

Site – SemMaterials LP Spokane

SVRP – Spokane Valley-Rathdrum Prairie Aquifer

TEE – terrestrial ecological evaluation

TPH – total petroleum hydrocarbons

UECA – Uniform Environmental Covenants Act

WAC – Washington Administrative Code

WSDOT – Washington State Department of Transportation

1 Introduction

This report presents the Washington State Department of Ecology's (Ecology) proposed cleanup action for the SemMaterials LP Spokane site (Site). The general location of the Site is shown in Figure 1 – Site Vicinity Map.

This Cleanup Action Plan (CAP) is a required part of the cleanup process under Chapter 173-340 of the Washington Administrative Code (WAC), Model Toxics Control Act (MTCA) cleanup regulations, Chapter 70A.305 Revised Code of Washington (RCW), implemented by Ecology.

The cleanup action decision is based on the Remedial Investigation/Feasibility Study (RI/FS) and other relevant documents in the administrative record. Ecology has named BNSF Railway Company (BNSF), Koch Materials, LLC (Koch), Marathon Oil Company (Marathon), and SemMaterials L.P. (Sem) as potentially liable persons (PLPs). BNSF, Husky, and Marathon completed Site investigation activities under Agreed Order No. 5589. Sem signed the Agreed Order but subsequently filed a petition for relief under the Bankruptcy Code and did not participate in Site investigations.

The purpose of the CAP is to identify the proposed cleanup action for the Site and to provide an explanatory document for public review that:

- Describes the history of operations, ownership, and activities at the Site
- Summarizes nature and extent of contamination
- Summarizes the cleanup action alternatives considered in the FS and the remedy selection process
- Identifies indicator hazardous substances (IHSs) and their Site-specific cleanup levels (CULs) and points of compliance for each medium of concern for the proposed cleanup action
- Identifies applicable state and federal laws for the proposed cleanup action
- Describes the selected cleanup action for the Site and the rational for selecting this alternative
- Identifies residual contamination remaining on the Site after cleanup and restrictions on future uses and activities at the Site to ensure continued protection of human health and the environment
- Discusses any required compliance monitoring and institutional controls
- Presents the schedule for implementing the CAP

1.1 Declaration

Ecology has selected this remedy because it will be protective of human health and the environment. Furthermore, the selected remedy is consistent with the State of Washington's preference for permanent solutions, as stated in RCW 70A.305.030(1)(b). However, we will consider all public input before making the CAP final.

1.2 Applicability

Cleanup standards specified in this CAP are applicable only to the SemMaterials LP Spokane Site. They were developed as a part of an overall remediation process under Ecology oversight using the authority of MTCA, and should not be considered as setting precedents for other sites.

1.3 Administrative record

The documents used to make the decisions discussed in this CAP are on file in the administrative record for the Site. The entire administrative record for the Site is available for public review by appointment at Ecology's Eastern Regional Office, located at 4601 N. Monroe Street, Spokane, Washington, 99205-1295. Results from applicable studies and reports are summarized to provide background information pertinent to the CAP. These studies and reports include:

- Aspect Consulting LLC, 2013, *SemMaterials L.P. Spokane Site Remedial Investigation/Feasibility Study Report*. Prepared for the SemMaterials Potentially Liable Persons Group, January 31, 2013.
- Aspect Consulting LLC, 2010a, *SemMaterials Site Remedial Investigation*. Prepared for the SemMaterials Potentially Liable Party Group, May 18, 2010.
- Aspect Consulting LLC, 2010b, *Remedial Investigation/Feasibility Study Phase II Work Plan, SemMaterials L.P. Spokane Site*. Prepared for the SemMaterials Potentially Liable Party Group, June 18, 2010.
- Aspect Consulting LLC, 2010c, *SemMaterials L.P. Spokane Site – August 2010 Groundwater Quality Assessment*. Prepared for the SemMaterials Potentially Liable Party Group, December 10, 2010.
- Aspect Consulting LLC, 2011a, *SemMaterials L.P. Spokane Site – November 2010 Groundwater Quality Assessment*. Prepared for the SemMaterials Potentially Liable Party Group, February 14, 2011.
- Aspect Consulting LLC, 2011b, *SemMaterials L.P. Spokane Site – February 2011 Groundwater Quality Assessment*. Prepared for the SemMaterials Potentially Liable Party Group, June 13, 2011.
- Aspect Consulting LLC, 2011c, *SemMaterials Site Phase I and II Remedial Investigation Data Summary Report*. Prepared for the SemMaterials Potentially Liable Party Group, November 30, 2011.
- Golder Associates, Inc., 2008, *Remedial Investigation/Feasibility Study Work Plan for the SemMaterials L.P. Spokane Facility*, 4327 North Thor Street Spokane, Washington. July 24, 2008.
- Groundwater Technology, Inc., 1996a, *Hydrocarbon Characterization Investigation, Hillyard Site, Spokane, Washington*. Prepared by Groundwater Technology, Inc. March 25, 1996.

- Groundwater Technology, Inc., 1996b, "Addendum to Hydrocarbon Characterization Investigation, Hillyard Site, Spokane, Washington." Prepared by Groundwater Technology, Inc. April 6, 1996.
- ERM-West, Inc., 2019, *SemMaterials L.P. Monitoring Well Decommissioning Report*. Prepared by ERM-West, Inc., December 11, 2019.
- Radian International, 1996a, *Tank Farm Site Investigation Koch Materials Company, Hillyard Asphalt Plant, Spokane, Washington*. Prepared by Radian International, September 1996.
- Radian International, 1996b, *Bioventing System and Cap Installation Work Plan, Koch Materials Company, Hillyard Asphalt Plant, Spokane, Washington*. Prepared by Radian International, October 1996.
- Radian International, 1997, *Installation and Operation Report Bioventing System, Koch Materials Company, Hillyard Asphalt Plant, Spokane, Washington*. Prepared by Radian International, February 28, 1997.
- SCS Engineers Inc., 1992, *Site Investigation, Koch Hillyard Site, Spokane, Washington*. Prepared by SCS Engineers. December 17, 1992.
- SCS Engineers Inc., 1993a, *Analytical Results, Koch Hillyard Station, Spokane, Washington*. Prepared by SCS Engineers. February 3, 1993.
- SCS Engineers Inc., 1993b, *Additional Analytical Results, Koch Hillyard Station, Spokane, Washington*. Prepared by SCS Engineers. February 4, 1993.
- SCS Engineers Inc., 1993c, *Rough Comparison of Analytical Options, Koch Hillyard Station, Spokane, Washington*. Prepared by SCS Engineers. February 8, 1993.
- SCS Engineers Inc., 1993d, *Additional Work, Koch Hillyard Station, Spokane, Washington*. Prepared by SCS Engineers. February 11, 1993.
- SCS Engineers Inc., 1993e, *Proposal and Cost Estimate to Evaluate Subsurface Contamination, Koch Materials Hillyard Site, Spokane, Washington*. Prepared by SCS Engineers. February 24, 1993.
- SCS Engineers Inc., 1993f, *Closure of Investigation Project, Koch Materials, Spokane, Washington*. Prepared by SCS Engineers. March 12, 1993.
- Washington Department of Ecology, 2001. Model Toxics Control Act, Chapter 173-340 WAC. Publication No. 94-06.
- Washington Department of Ecology, 2001. Cleanup Levels and Risk Calculations under the Model Toxics Control Act, Version 3.1. Publication No. 94-145.
- Washington Department of Ecology, 2008. Agreed Order No. 5589 for the SemMaterials Site located 4327 North Thor Street, Spokane, Washington. Agreement between Ecology and BNSF, Koch Materials, and Marathon, April 2008.

1.4 Cleanup process

Cleanup conducted under the MTCA process requires the PLPs or Ecology to prepare specific documents. These procedural tasks and resulting documents, along with the MTCA section

requiring their completion, are listed below with a brief description of each task.

- Public Participation Plan (WAC 173-340-600) — summarizes the methods that will be implemented to encourage coordinated and effective public involvement. Ecology prepares this document.
- RI/FS (WAC 173-340-350) — documents the investigations and evaluations conducted at the Site from the discovery phase to the RI/FS document. The RI collects and presents information on the nature and extent of contamination and the risks posed by the contamination. The FS presents and evaluates Site cleanup alternatives and may propose a preferred cleanup alternative. The documents are usually prepared by the PLPs, accepted by Ecology, and undergo public comment.
- CAP (WAC 173-340-380) — this is Ecology's decision document that sets cleanup standards for the Site, and selects the cleanup actions intended to achieve the cleanup standards. Ecology issues the document, and it undergoes public comment.
- Engineering Design Report, Construction Plans and Specifications (WAC 173-340-400) — outlines details of the selected cleanup action, including any engineered systems and design components from the CAP. These may include construction plans and specifications with technical drawings. The PLPs usually prepare the document, and Ecology approves it. Public comment is optional.
- Operation and Maintenance Plan(s) (WAC 173-340-400) — summarizes the requirements for inspection and maintenance of remediation operations. They include any actions required to operate and maintain equipment, structures, or other remedial systems. A Maintenance and Repair Plan may also fulfill this requirement. The PLPs usually prepare the document, and Ecology approves it.
- Cleanup Action Report (WAC 173-340-400) — provides details on the cleanup activities along with documentation of adherence to or variance from the CAP and engineering design report following implementation of the cleanup action. The PLPs usually prepare the document, and Ecology approves it.
- Compliance Monitoring Plan (WAC 173-340-410) — details the monitoring activities required to ensure the cleanup action is performing as intended. The PLPs usually prepare the document, and Ecology approves it.

2 Site Background

This section summarizes the Site's history, contamination investigations, and physical characteristics.

2.1 General information

The 10-acre property has been used for petroleum storage and asphalt-manufacturing activities

since 1955, and is still operational. The Site is located in east-central Spokane and is zoned Light Industrial. The site is bordered by the Aluminum Recycling Corporation cleanup site to the north (zoned Light Industrial), residential and commercial properties to the east (zoned Light Industrial), vacant land to the south (zoned Light Industrial), and the BNSF Railway Black Tank cleanup site, an active BNSF rail line and vacant land to the west (zoned Center and Corridor Type 2). The Washington State Department of Transportation (WSDOT) plans to construct a limited-access freeway, knows as the North Spokane Corridor (NSC), west of the Site on BNSF's property.

The bulk storage terminal consists of 54 above-ground storage tanks (ASTs) that store asphalt-related petroleum products. The ASTs vary in size and reportedly held a total of 12.5 million gallons of product at their capacity. Petroleum products are delivered and dispersed via rail or truck. Pipelines transfer the products between the storage tanks. The facility includes the aforementioned storage tanks, an office, loading rack, shop, scales, and four storage buildings. The location of site features can be seen in Figure 2 – Site Plan.

2.2 History

BNSF and its predecessors have owned the site property since the early 1900s. The site has been used for a variety of asphalt- and petroleum-related activities and processes since 1955, and has contained numerous ASTs in various configurations. Husky Oil Company of Delaware, a predecessor of Marathon, operated at the Site from the 1970s until 1982. Intermountain Asphalt Company operated the Site from 1982 until 1983. Koch Materials operated the Site from 1983 to 2005, when SemMaterials L.P. began operations at the facility. SemMaterials L.P. filed for relief under Chapter 11 of the Bankruptcy Code in July 2008. The site is currently occupied by ERGON Asphalt & Emulsions, LLC.

In December 1992, three ASTs at the Site were dismantled; these ASTs contained diesel fuel No. 1 (AST Nos. 12 and 13) and diesel fuel No. 2 (AST No. 14), and were also reported to have contained Bunker C fuel oil. Petroleum-contaminated soil was discovered under the ASTs during the time of the dismantling work. Koch was the operator of the facility at the time. Koch Materials notified Ecology of the petroleum release at the Site on December 4, 1992. Ecology conducted an initial investigation of the facility on January 20, 1993, and informed Koch Materials by letter dated February 23, 1993, that the facility would be listed on Ecology's hazardous sites database. Ecology met with Koch Materials on March 8, 1993, to discuss the investigation of the release area. After the discovery of the release, there were limited investigations of the contamination and some independent interim remedial measures. These pre-RI activities were conducted independently, without Ecology oversight, and are described in Section 2.3.

Based upon credible evidence, Ecology issued a preliminary PLP status letter to BNSF and SemMaterials on May 12, 2006, pursuant to RCW 70A.305.040, -.020(16) and WAC 173-340-500. Ecology sent preliminary PLP status letters to Koch Materials on October 10, 2006, and Marathon on July 17, 2007. After providing notice and opportunity for comment, reviewing any

comments submitted, and concluding that credible evidence supported a finding of potential liability, Ecology issued final determinations of PLP status to the four parties.

Ecology and the PLPs entered into Agreed Order 5589 on April 18, 2008, to complete an RI/FS at the site. BNSF, Marathon, and Koch submitted a draft RI/FS report in early 2013, and after a 30-day public comment period, the RI/FS report was finalized on April 10, 2013.

2.3 Investigations

Petroleum-contaminated soil was observed in the Northeast Tank Farm area during the dismantling of several ASTs in December 1992. In January 1993, three exploratory borings (BH-1 through BH-3) were completed to 20 feet below ground surface (bgs). Petroleum contamination was identified at depths up to 5 feet bgs in BH-1 and BH-3, and up to 20 feet bgs in BH-2.

In 1993, an additional boring (BH-4) was completed to a depth of 125 feet bgs near BH-2 to determine the vertical extent of contamination. A clayey, silt layer was observed in the 125 foot sample and drilling was terminated at the 125 foot depth. Petroleum contamination exceeding the MTCA Method A CUL was found in BH-4 to a depth of at least 125 feet bgs. In addition, five shallow test pits (TP-1 through TP-5) were excavated to depths of 10–12 feet bgs to refine the lateral extent of shallow soil contamination. Samples collected from the test pits showed heavy oil contamination greater than the MTCA Method A CUL.

The Spokane County Health District completed a Site Hazard Assessment of the facility in January 1995. The facility received a hazard ranking of three on a scale of one to five with one being considered the highest risk.

Boring BH-5 was drilled near BH-4 in 1996 to a depth of 126 feet bgs in an effort to characterize the vertical extent of contamination. Samples from the ground surface to 125 feet bgs did not indicate the presence of petroleum contamination; however, a black viscous oil was observed from 125 to 125.5 feet bgs. The soil below 125.5 feet bgs was a silty clay with no indication of petroleum contamination. A sample from 125 feet bgs contained petroleum contamination that was characterized as biodegraded heavy or residual fuel oil.

Eight additional soil borings (BH-6 through BH-13) and one hand auger hole (BH-14) were drilled in 1996 in the Northeast Tank Farm area to determine the lateral extent of contamination. The depths of the borings ranged from 20 to 41 feet bgs. Samples from the borings indicated heavy-end hydrocarbon contamination greater than the MTCA Method A CUL was present and ranged from 0.75 feet bgs to 41 feet bgs. A summary of site soil data, including data from the RI, is in Table 1. The locations of site explorations are in figures 3 and 4 – Site Explorations and Northeast Tank Farm Explorations, respectively.

Following a review of investigation results, an active bioventing system was installed in the Northeast Tank Farm area in late 1996. This interim remedial action was performed independently. Along with the bioventing system, a cap was placed over the Northeast Tank Farm area. The intent of the bioventing system installation was to enhance microbial

degradation of contamination in the subsurface, while the cap eliminated surface water infiltration through the contamination. The bioventing system operated from January 1997 to January 2004, when the active system was shut down and converted to a passive bioventing system. The decision was based on the system discharge effluent concentrations, which had become asymptotic.

2.4 Physical characteristics

2.4.1 Topography and climate

The 10-acre Site is relatively level and mostly unpaved. The general land slope at the Site and surrounding properties is relatively flat with a drop in elevation to the west near the rail corridor. The Site elevation is about 2,040 feet above sea level using the National Geodetic Vertical Datum of 1929.

The average yearly precipitation is 16.52 inches, with the majority occurring November through May; snow generally occurs between November and April. The average high temperature occurs in July and is 83 degrees Fahrenheit; the average low temperature occurs in December and is 22.5 degrees Fahrenheit.

2.4.2 Regional and Site geology

The Spokane area is underlain by Precambrian age metamorphic rocks. These basement rocks are overlain by metamorphic and igneous rocks, which in turn are mantled by the Tertiary age Columbia River Basalts. The basalts are covered by Quaternary age glaciofluvial flood deposits consisting of sands and gravels with cobbles and boulders, and inclusions of silt and clay lenses (Molenaar, 1988).

The Site is situated over an area known as the Hillyard Trough. The deposits within the Hillyard Trough are finer-grained than those found over much of the Spokane area, being comprised predominantly of stratified sand with some gravel and silt (Drost and Sietz, 1978).

The site geologic interpretation comes from analysis of Site soil boring and monitoring well logs**.** The upper soil profile consists of brown to grey, fine to coarse-grained gravel with some sand, cobbles, and silt. The sand and silt amount appears to increase with depth, and this results in a transition to a grey-brown, medium-dense fine to coarse grained sand with silt and gravel. The gravel is fine to coarse and is typically sub-angular to sub-rounded.

2.4.3 Regional and Site hydrogeology

The Site lies above the Hillyard Trough portion of the Spokane Valley-Rathdrum Prairie Aquifer (SVRP). The U.S. Environmental Protection Agency designated the aquifer as a “sole-source aquifer” in 1978. This designation under provisions of the Federal Safe Drinking Water Act of 1974 recognizes the aquifer is the major source of drinking water for the Spokane area.

The aquifer extends westward from the Washington-Idaho state line to the east side of the City of Spokane, and then turns northerly towards Long Lake. Five-Mile Prairie, west of the Site,

splits the aquifer into two portions just northwest of the City of Spokane. The aquifer boundaries in the Hillyard Trough are generally comprised of flow basalt or granitic intrusives.

Groundwater at the Site is typically encountered 165 to 172 feet bgs. Based on Site groundwater elevations, groundwater beneath the Site generally flows north to northwest. The SVRP is unconfined and can fluctuate between 4 to 7 feet over a season.

The hydraulic gradient at the Site is about 0.0014 feet per foot (ft/ft). This gradient is consistent with published reports of 0.004 ft/ft in the southern portion of the trough to 0.008 ft/ft in the northern portion of the trough. Groundwater migrating through the trough discharges into the Little Spokane River approximately seven miles northwest of the Site. The discharge flow has been estimated by the United States Geological Survey at 310 cubic feet per second (Drost and Sietz, 1978).

2.4.4 Surface water

The nearest significant surface water body is the Spokane River, which lies approximately 1.5 miles south of the Site. Deadman Creek is approximately 5.5 miles north of the Site, and the Little Spokane River is approximately seven miles northwest of the Site. Generally, the Spokane and Little Spokane rivers flow in a westerly direction. Based on groundwater flow directions, the Spokane River is hydraulically upgradient of the Site while the Little Spokane River is downgradient of the Site.

Additionally, a man-made stormwater collection basin on the adjacent Hillyard Dross site to the north reportedly contains water all year round.

3 Remedial Investigation

Phase I RI activities under Agreed Order 5589 began in October 2008 and included installation of six monitoring wells, shallow soil investigation using a direct push drill rig, and three quarterly groundwater monitoring events. Additional information regarding Site activities, sampling, analyses, and methodology is contained in the RI/FS (Aspect 2013). Site exploration locations are in figures 3 and 4 – Site Explorations and Northeast Tank Farm Explorations, respectively.

3.1 Soil

Phase I soil investigations included sampling and analysis of shallow (up to 16 feet bgs) and deep (up to 176 feet bgs) soils during site exploration and monitoring well drilling. A summary of site soil data, including data from previous site investigations, can be found in Table 1. The detection frequency of selected site analytes in soil is shown in Table 2.

3.1.1 Shallow soil

Thirty soil borings (GGP01 through GGP30) were completed to a depth of 16 feet bgs. Analytical results from these borings indicate that diesel- (DRPH) and oil-range petroleum hydrocarbon (ORPH) contamination is present at concentrations greater than MTCA Method A industrial CULs near the center of the Site (borings GGP06, GGP09, and GGP30) and northwest of the Northeast Tank Farm (boring GGP24). Polycyclic aromatic hydrocarbons (PAHs) were detected at concentrations greater than the MTCA Method A industrial CUL in three soil borings: GGP09, GGP21B, and GGP24. Naphthalenes were detected at concentrations greater than the MTCA Method A industrial cleanup level in two borings: GGP09 and GGP24.

3.1.2 Deep soil

Six groundwater wells were installed during Phase I investigations (GMW-01 through GMW-06). Groundwater wells were drilled using sonic or air rotary drilling and completed to depths from 190 to 197 feet bgs. Soil samples were collected from monitoring well borings GMW-01 and GMW-02 at depths between 105 to 176 feet bgs. Analytical results indicated that petroleum hydrocarbons and PAHs were not present in detectable concentrations in these samples, and naphthalenes were present at concentrations less than the MTCA Method A industrial CUL.

3.2 Groundwater

Phase I groundwater investigations included three quarterly groundwater monitoring events. Sample results indicated the presence of DRPH and ORPH in groundwater. Total petroleum hydrocarbons (TPH) were detected in a duplicate sample taken from UDCMW-4 at a concentration greater than the MTCA Method A CUL during the August 4, 2009, sampling event; however, the other duplicate sample was sent to a different lab for analysis, and the TPH concentration from that sample was less than the MTCA Method A CUL. Therefore, it is unclear what the actual concentration of TPH was in UDCMW-4 during the August 2009 sampling event.

Phase II RI work began August 2010 and consisted of four additional quarterly groundwater sampling events. TPH were detected at concentrations greater than the MTCA Method A CUL in UDCMW-4 during the February 15, 2011, sampling event. However, the sample chromatograph pattern does not resemble the fuel standard used for quantification.

PAHs and naphthalene either were not detected or were detected at concentrations less than MTCA Method A CULs during the Phase I and Phase II groundwater investigations. The detection frequency of selected site analytes in groundwater is in Table 3.

Due to conflicting analytical data from UDCMW-4, the sample chromatograph patterns not matching the site fuel standard, and its position relative to site contamination (cross-gradient), Ecology does not believe samples from this well are indicative of Site groundwater conditions. TPH detected in this well may be from off-Site sources, lab inaccuracies, or other interferences. As wells GMW-01 through GMW-06 are positioned downgradient from Site contamination, analyses from these wells more accurately depict Site groundwater conditions, and therefore were used to make determinations regarding cleanup alternatives.

The WSDOT notified BNSF that they would be initiating NSC construction in the vicinity of the Site on September 30, 2019, and requested that all monitoring wells in construction areas (cut areas and shoofly pathways) be decommissioned prior to their breaking ground. The WSDOT and BNSF identified five monitoring wells that required decommissioning (GMW-1 through GMW-5). Ecology approved decommissioning of these wells in an email dated July 22, 2019 (ERM-West, Inc., 2019). A sixth Site monitoring well (GMW-06) will also be decommissioned as part of this CAP.

3.3 Risks to human health and environment

Shallow (0–15 feet bgs) DRPH, ORPH, carcinogenic polycylic aromatic hydrocarbons (cPAH), and naphthalene soil contamination is in the south-central portion of the Site and in boring GGP24, northwest of the Northeast Tank Farm. Shallow and deep (15–125 feet bgs) DRPH and ORPH soil contamination is present in the northeast corner of the site in the area of the Northeast Tank Farm.

Based on an industrial land use designation, two potential site receptors were identified. A brief description of each follows.

3.3.1 Current and future on-Site industrial/commercial workers

This category includes current and future operational employees and construction workers. Direct soil contact is the potential exposure pathway for this category.

3.3.2 Future off-Site human exposure

The only anticipated off-Site human exposure is from groundwater consumption. Site groundwater has not exceeded CULs, but due to the SVRP's designation as a sole-source aquifer, potential groundwater contamination was considered during Site evaluation.

4 Cleanup Standards

4.1 Overview

MTCA requires the establishment of cleanup standards for individual sites. Cleanup standards include both CULs and points of compliance for those CULs.

The cleanup standard development process is used to determine which hazardous substances contribute to an overall threat to human health and the environment at a site. Once these substances are identified, they are considered the IHSs for the site. An evaluation is made to determine at what concentrations the IHSs are considered to be protective of human health and the environment for each impacted media; these concentrations become the CULs for the site. MTCA provides three options for establishing CULs: methods A, B, and C.

- Method A may be used to establish CULs at routine sites or sites with relatively few hazardous substances.
- Method B is calculated from applicable or relevant and appropriate requirements (ARARs) and the formulas provided in WAC 173-340-720 through -760, and is the standard method for establishing CULS at sites where Method A may not be applicable. Method B may be used to establish CULs at any site.
- Method C is a conditional method used when a CUL under Method A or B is technically impossible to achieve or may cause significantly greater environmental harm. Method C also may be applied to qualifying industrial properties.

If necessary, the selected CULs may be adjusted downward for carcinogenic substances based on the total site risk of 1×10^{-5}, and for non-carcinogenic substances based on a hazard index of 1. All media exceeding a CUL must be addressed through a cleanup remedy that prevents exposure to the contaminated material.

A point of compliance is then established on the site for each impacted media; a point of compliance is a point or points where the CULs must be attained as defined in WAC 173-340-200.

4.2 Site use

The evaluation of CULs, points of compliance, and ecological exposures depends on the nature of the Site use. A Site may be designated either an unrestricted or industrial property under MTCA. Industrial properties are defined in WAC 173-340-200; the definition includes properties characterized by transportation areas and facilities zoned for industrial use. Industrial properties are further described in WAC 173-340-745(1) with the following characteristics:

- People do not normally live on industrial property;
- Access by the general public is generally not allowed;
- Food is not normally grown/raised;
- Operations are often characterized by chemical use/storage, noise, odors, and truck traffic;
- Ground surface is mostly covered by buildings or other structures, paved lots and roads, and storage areas; and
- Support facilities may be present, but they are intended to serve the industrial facility and its employees and not the general public.

The Site had been designated as an industrial property for the purposes of this cleanup under MTCA based on the following factors:

- The Site is zoned Light Industrial and is largely surrounded by properties zoned Light Industrial.
- The Site is a controlled-access asphalt manufacturing facility with bulk petroleum storage. Asphalt and associated petroleum products are delivered and dispersed via rail or truck. The Site includes numerous ASTs, an office, loading rack, shop, scales, and four

storage buildings. Based on site characteristics, the Site meets the guidelines in WAC 173-340-200 and -745(1) to be designated as industrial.

Based on this designation, MTCA Method A industrial CULs will be the starting point for determining CULs for the Site.

4.3 Terrestrial ecological evaluation

WAC 173-340-7490 requires that sites perform a terrestrial ecological evaluation (TEE) to determine the potential effects of soil contamination on ecological receptors. The results of the TEE indicate whether site CULs should be adjusted to protect ecological receptors.

Ecology conducted a simplified TEE for the Site and determined that the Site does not pose a threat of significant adverse effects to terrestrial ecological receptors. Therefore, in accordance with WAC 173-340-7492, further ecological consideration is not needed. The TEE is included as Appendix A.

4.4 Indicator hazardous substances

IHSs as defined by WAC 173-340-200 are a subset of hazardous substances present at a site and selected under WAC 173-340-708 for monitoring and analysis. Following the selection of IHSs, cleanup levels are developed for the list of substances used to calculate the total site risk.

When defining CULs at a site contaminated with several hazardous substances, Ecology may eliminate from consideration those contaminants contributing a small percentage of the overall threat to human health and the environment. WAC 173-340-703(2) provides a hazardous substance may be eliminated from further consideration based on:

- The toxicological characteristics of the substance which govern its ability to adversely affect human health or the environment relative to the concentration of the substance;
- The chemical and physical characteristics of the substance which govern its tendency to persist in the environment;
- The chemical and physical characteristics of the substance which govern its tendency to move into and through the environment;
- The natural background concentration of the substance;
- The thoroughness of testing for the substance;
- The frequency of detection; and
- The degradation by-products of the substance.

4.4.1 Soil IHSs

The soil IHSs for the Site are DRPH, ORPH, PAHs, and naphthalenes. These substances were all detected at frequencies of 11% or greater in Site samples, and their maximum concentrations were greater than twice the MTCA Method A industrial CULs.

4.4.2 Groundwater IHS

There are no groundwater IHSs for the Site, as site contaminants were either less than site CULs or site analytical data greater than CULs was considered unreliable.

4.5 Site cleanup levels

Site contamination is a direct result of historic petroleum releases at the site, and soil is the contaminated media of focus. DRPH, ORPH, PAHs, and naphthalenes are the IHSs for the Site. Exposure pathways are considered when establishing cleanup standards for the Site.

The exposure pathways considered for soil are direct contact and protection of groundwater. Soil cleanup levels set under Method A industrial standards must be at least as stringent as the criteria in WAC 173-340-745(3)(b), which includes the following:

i) Concentrations in Table 745-1 and compliance with the corresponding footnotes.
ii) Concentrations established under applicable state and federal laws.
iii) Concentrations that result in no significant adverse effects on the protection and propagation of terrestrial ecological receptors using the procedures specified in WAC 173-340-7490 through -7493, unless it is demonstrated under those sections that establishing a soil concentration is unnecessary.
iv) For a hazardous substance that is deemed an IHS under WAC 173-340-708(2) and for which there is no value in Table 745-1 or applicable state and federal laws, a concentration that does not exceed the natural background concentration or the practical quantification limit, subject to the limitations in WAC 173-340.

Method A industrial soil CULs have been selected for the site because it qualifies under the criteria established in WAC 173-340-745. Because Method A industrial cleanup levels are used, institutional controls that comply with the Uniform Environmental Covenants Act (UECA – 64.70 RCW) are required. Soil and groundwater CUL evaluations are in tables 4 and 5, respectively.

4.6 Point of compliance

MTCA defines the point of compliance as the point or points where CULs shall be attained. Once CULs are met at the point of compliance, the Site is no longer considered a threat to human health or the environment.

WAC 173-340-740(6) gives the point of compliance requirements for soil. The standard point of compliance for soil CULs based on protection of groundwater is throughout the soil column. The standard point of compliance for soil has been selected for the Site.

5 Cleanup Action Selection

5.1 Remedial action objectives

The remedial action objectives are statements describing the actions necessary to protect human health and the environment by eliminating, reducing, or otherwise controlling risks posed through each exposure pathway and migration route. They are developed considering the characteristics of the contaminated media, the characteristics of the hazardous substances present, migration and exposure pathways, and potential receptor points.

Based on Site use, Ecology has determined the reasonable exposure pathways for soil are direct contact and protection of groundwater.

Given these potential exposure pathways, the following are the remedial action objectives for the Site:

- Prevent direct contact, ingestion, or inhalation of contaminated soil by humans.
- Prevent groundwater contamination caused by soil contamination.

5.2 Cleanup action alternatives

The FS proposed four remedial alternatives. The first is no further remedial action, relying solely on completed remediation. The second and third alternatives combine institutional and engineering controls and monitored natural attenuation. The remaining alternative involves complete contaminated soil removal and disposal. Three of the four alternatives were developed to comply with ARARs and provide protection of human health and the environment. It is important to note that the alternatives presented in the FS did not address naphthalene or PAH contamination, and were based on CULs different from those used in this CAP. The cleanup alternatives as detailed below have been modified to address those factors.

5.2.1 Alternative 1 – Completed remedial actions

The purpose of this alternative is to illustrate the results of the remedial actions completed to date, with no further remedial action at the Site. Results include:

- Eliminating the sources of TPH releases
- Treating TPH in soil in the Northeast Tank Farm Area with a bioventing system
- Constructing an asphalt cap in the Northeast Tank Farm Area.

The TPH source removal and operation of the bioventing system have likely reduced the concentrations of TPH in the Northeast Tank Farm Area. Bioventing, particularly with heavier end hydrocarbons, has been demonstrated to reduce contaminant mass in the subsurface. Contaminant concentrations will likely continue to decrease due to volatization and biodegradation in the subsurface. In addition, capping the contaminated soil in the Northeast

Tank Farm Area provides protection from direct exposure to soil and protects Site groundwater quality by minimizing infiltration.

There are no further remedial action costs for this alternative. However, without institutional controls, it is possible that the contaminated soil cap could be damaged or removed, in which case it might cease to be protective of groundwater. In addition, this alternative does not address contamination near the center of the site, or naphthalene or cPAH contamination throughout the site.

5.2.2 Alternative 2 – Existing asphalt cap, construction of cap in central and northern portions of site, and institutional controls

The purpose of this alternative is to maintain the protection offered by the existing cap while volatization and biodegradation continue to reduce the concentrations of IHSs in soil at the Site. This alternative includes the following elements:

- Construct and maintain an approximate 8,000-square-foot cap in the vicinity of soil borings GGP06, GGP09, and GGP30, and an approximate 800-square-foot cap in the vicinity of soil boring GGP24. The caps will be designed to prevent direct contact with shallow (between ground surface and approximately 15 feet bgs) TPH-, naphthalene-, and cPAH-impacted soil. The cap could consist of clean imported fill, asphalt, or concrete. The cost of a concrete cap is used for the disproportionate cost analysis (DCA), which is summarized in Section 5.4.2. Note that the cost of the cap used in the DCA was extrapolated from the cost of the cap proposed in Table 9.1 of the FS, and some cost savings from the dollar amount used in this DCA may be possible due to economy of scale. Some contaminated soil may be excavated and removed from the Site during cap construction to lower the ground surface so the cap surface will match the current grade of the site.
- Maintain the existing pavement cap (or equivalent) in the Northeast Tank Farm Area of the Site, preventing contact with and infiltration through TPH-impacted soil.
- Decommission the remaining groundwater monitoring well (GWM-06).
- Maintain existing Site security measures to limit trespassing and unauthorized access. If Site use changes, security measures may be re-evaluated and modified with Ecology's approval.
- Place an environmental covenant on the property that restricts the following activities:
    - Certain subsurface disturbances and/or activities in areas with documented TPH-, naphthalene-, or cPAH-impacted soil.
    - Non-industrial use unless additional analysis and cleanup actions are completed.

For cost estimating purposes, the total duration of this alternative is assumed to be 30 years. The estimated cost for this alternative is $365,000.

5.2.3 Alternative 3 – Partial soil excavation and disposal, existing cap, and institutional controls

The purpose of this alternative is to eliminate the potential for direct exposure by removal of the upper 15 feet of impacted soil with IHS concentrations greater than CULs. Because some

existing facilities will need to be removed to allow soil excavation, a replacement cap would be constructed over the Northeast Tank Farm area to prevent infiltration through TPH-impacted soil while volatization and biodegradation continue to reduce the concentration of IHSs in soil at the Site. This alternative includes the following elements:

- Demolish, remove, and dispose of the existing facilities and pavement to facilitate excavation of impacted soil.
- Excavate soil impacted with IHS concentrations greater than cleanup levels to a depth of 15 feet bgs. The excavated soil would be disposed at an appropriately licensed disposal/treatment facility. Based on the existing information regarding the depth of contaminant concentrations, this action would eliminate the soil impacts in the Central Area, but contaminant concentrations greater than cleanup levels would remain in the Northeast Tank Farm and North Areas at depths greater than 15 feet bgs.
- Replace the Northeast Tank Farm Area asphalt cap with an equivalent low permeability cap to prevent stormwater infiltration and minimize the potential for residual IHSs in soil to migrate into groundwater.
- Construct a low-permeability cap over the portion of the North Area that still contains IHS concentrations greater than cleanup levels to prevent stormwater infiltration and minimize the potential for residual IHSs in soil to migrate into groundwater.
- Maintain existing Site security measures to limit trespassing and unauthorized access. If Site use changes, security measures may be re-evaluated and modified with Ecology's approval.
- Place an environmental covenant on the property to maintain the integrity of the low-permeability cap and restrict the following activities:
    - Certain subsurface disturbances and/or activities in areas with documented TPH-, naphthalene-, or cPAH-impacted soil.
    - Non-industrial Site use, unless additional analysis and cleanup actions are completed.

For cost estimating purposes, the total duration of this alternative is assumed to be 30 years. The estimated cost for this alternative is $3,300,000, which does not include demolition or any facility capital replacement costs.

5.2.4 Alternative 4 – Complete soil excavation and disposal

The purpose of this alternative is to physically remove all impacted soil with concentrations of IHSs greater than cleanup levels on the Site, providing the most permanent remedial solution in the shortest amount of time. This alternative eliminates the need for long-term monitoring and/or institutional controls and involves the following elements:

- Demolition, removal, and disposal of the existing facilities to allow excavation of impacted soil.
- Excavation of IHS-impacted soils in the following areas:
    - **Central Area:** Excavation of IHS-impacted soils as well as sufficient clean soils to provide stable sidewalls. To provide sufficient slope stability, the excavation sidewalls would be laid back at approximately 1.5 to 1 (horizontal to vertical).

Since IHS-impacted soils are expected relatively shallow (within 15 feet of the ground surface), no shoring is expected to be used for this area.

- **Northeast Tank Farm Area:** Due to the greater depth of IHS-impacted soils (170 feet) in this area, an un-shored excavation would only cover approximately 9 acres (extending several hundred feet onto neighboring properties to the north and east) and require removal of all the facilities on the eastern half of the SemMaterials property. In addition, this approach would require stockpiling approximately 950,000 cubic yards of clean soils on or near the Site, which would require approximately 10 acres of additional space (the SemMaterials property is approximately 10 acres.) This approach would require either purchasing neighboring parcels or obtaining temporary easement to excavate on the property, both of which could be infeasible.
- An alternate approach would be to shore the excavation sidewalls to a depth of 170 feet. Shoring would prevent off-site construction impacts and reduce the amount of clean soil to handle. Given the coarse, unconsolidated nature of the Site soils, constructing a shored excavation to this depth would require relatively innovative and expensive shoring technology. Possible approaches include: 1) a cantilevered wall with tiebacks extending into neighboring properties (requiring an easement from neighboring property owners), and 2) a series of overlapping large-diameter shafts (50 to 100 feet in diameter) that are excavated to the water table and supported with a stack of concentric shoring rings. The shoring rings are removed as each excavation is backfilled with clean material.
- **North Area:** Due to the greater depth of IHS-impacted soils (50 feet bgs), this area could also be remediated with either a shored or un-shored excavation using approaches discussed above for the Northeast Tank Farm area. The un-shored excavation would extend onto neighboring properties and would require either purchase of the property or a temporary easement.

- Off-site disposal of IHS-impacted soil.
- Confirmation soil sampling and analysis during the excavation.
- Restoration of the property, including backfilling with clean imported material and stockpiled clean soils.

The estimated time to complete this alternative is approximately 1 year. The estimated cost for this alternative with no shoring is $38.8 million and $74.8 million with shoring. Neither cost scenario includes demolition of the existing facilities nor any facility capital replacement costs.

5.3 Regulatory requirements

MTCA sets forth the minimum requirements and procedures for selecting a cleanup action. A cleanup action must meet the requirements specified in WAC 173-340-360, including certain threshold and other requirements.

5.3.1 Threshold requirements

WAC 173-340-360(2)(a) requires that the cleanup action shall:

- Protect human health and the environment;
- Comply with cleanup standards (see Section 4);
- Comply with applicable state and federal laws (see Section 5.3.4); and
- Provide for compliance monitoring.

5.3.2 Other requirements

In addition, WAC 173-340-360(2)(b) states the cleanup action shall:

- Use permanent solutions to the maximum extent practicable;
- Provide for a reasonable restoration time frame; and
- Consider public concerns.

WAC 173-340-360(3) describes the specific requirements and procedures for determining whether a cleanup action uses permanent solutions to the maximum extent practicable. A permanent solution is defined as one where CULs can be met without further action being required at the Site other than the disposal of residue from the treatment of hazardous substances. To determine whether a cleanup action uses permanent solutions to the maximum extent practicable, a DCA is conducted. This analysis compares the costs and benefits of the cleanup action alternatives and involves the consideration of several factors, including:

- Protectiveness;
- Permanent reduction of toxicity, mobility, and volume;
- Cost;
- Long-term effectiveness;
- Short-term risk;
- Implementability; and
- Consideration of public concerns.

The comparison of benefits and costs may be quantitative, but will often be qualitative and require the use of best professional judgment.

WAC 173-340-360(4) describes the specific requirements and procedures for determining whether a cleanup action provides for a reasonable restoration time frame.

5.3.3 Cleanup action expectations

WAC 173-340-370 sets forth the following expectations for the development of cleanup action alternatives and the selection of cleanup actions. These expectations represent the types of cleanup actions Ecology considers likely results of the remedy selection process; however, Ecology recognizes that there may be some sites where cleanup actions conforming to these expectations are not appropriate.

- Treatment technologies will be emphasized at sites with liquid wastes, areas with high concentrations of hazardous substances, or with highly mobile and/or highly treatable contaminants;

- To minimize the need for long-term management of contaminated materials, hazardous substances will be destroyed, detoxified, and/or removed to concentrations below CULs throughout sites with small volumes of hazardous substances;
- Engineering controls, such as containment, may need to be used at sites with large volumes of materials with relatively low levels of hazardous substances where treatment is impracticable;
- To minimize the potential for migration of hazardous substances, active measures will be taken to prevent precipitation and runoff from coming into contact with contaminated soil or waste materials;
- When hazardous substances remain on-site at concentrations which exceed CULs, they will be consolidated to the maximum extent practicable where needed to minimize the potential for direct contact and migration of hazardous substances;
- For sites adjacent to surface water, active measures will be taken to prevent/minimize releases to that water; dilution will not be the sole method for demonstrating compliance;
- Natural attenuation of hazardous substances may be appropriate at sites under certain specified conditions (see WAC 173-340-370(7)); and
- Cleanup actions will not result in a significantly greater overall threat to human health and the environment than other alternatives.

5.3.4 Applicable, relevant, and appropriate state and federal laws, and local requirements

WAC 173-340-710(1) requires that all cleanup actions comply with all applicable local, state, and federal law. It further states the term "applicable state and federal laws" shall include legally applicable requirements and those requirements that the department determines "…are relevant and appropriate requirements."

WAC 173-340-710(4) sets forth the criteria Ecology evaluates when determining whether certain requirements are relevant and appropriate for a cleanup action. Table 6 lists the local, state, and federal laws containing the applicable or relevant and appropriate requirements that apply to the cleanup action at the Site. Local laws, which may be more stringent than specified state and federal laws, will govern where applicable. If other requirements are identified later, they will be applied to the cleanup actions at that time.

MTCA provides an exemption from the procedural requirements of several state laws and from any laws authorizing local government permits or approvals for remedial actions conducted under a consent decree, order, or agreed order (RCW 70A.305.090). However, the substantive requirements of a required permit must be met. The procedural requirements of the following state laws are exempted:

- Ch. 70A.15 RCW, Washington Clean Air Act;
- Ch. 70A.205 RCW, Solid Waste Management, Reduction, and Recycling;
- Ch. 70A.300 RCW, Hazardous Waste Management;
- Ch. 77.55 RCW, Construction Projects in State Waters;

- Ch. 90.48 RCW, Water Pollution Control; and
- Ch. 90.58 RCW, Shoreline Management Act of 1971.

5.4 Evaluation of cleanup action alternatives

The requirements and criteria outlined in Section 5.3 are used to conduct a comparative evaluation of the cleanup action alternatives and to select a cleanup action from those alternatives. Table 7 provides a summary of the ranking of the alternatives against the various criteria.

Alternative 1 was developed to illustrate the results of the remedial actions completed to date, with no further remedial action at the Site. It does not meet the threshold or other requirements detailed in WAC 173-340-360(2) because it does not address deep soil contamination, and therefore will not be evaluated with the other alternatives.

5.4.1 Threshold requirements

5.4.1.1 Protection of human health and the environment

Alternative 2 caps contamination in the central and northern portion of the site, maintains the cap in the Northeast Tank Farm area, and provides institutional controls to restrict actions that could compromise the alternative's effectiveness.

Alternative 3 excavates and disposes of contamination in the top 15 feet of soil, caps remaining deep contamination with a low-permeability cover, and provides institutional controls to restrict actions that could compromise the alternative's effectiveness.

Alternative 4 excavates and disposes of all impacted soil with concentrations of IHSs greater than CULs on the Site.

All three alternatives meet this requirement by eliminating the direct contact pathway and reducing the likelihood of migration of residual IHSs to groundwater.

5.4.1.2 Compliance with cleanup standards

Alternatives 2 and 3 comply with cleanup standards because they are protective of human health and the environment and terrestrial ecological receptors, include institutional controls that restrict activities that could interfere with the long-term integrity of the alternatives, and include provisions for compliance monitoring and periodic reviews.

Alternative 4 complies with cleanup standards because it is protective of human health and the environment and terrestrial ecological receptors and is a permanent cleanup action.

5.4.1.3 Compliance with applicable state and federal laws

Alternatives 2, 3, and 4 comply with applicable state and federal laws. A list of ARARs can be found in Table 6.

5.4.1.4 Provide for compliance monitoring

There are three types of compliance monitoring: protection, performance, and confirmational. Protection monitoring is designed to protect human health and the environment during the construction and operation and maintenance phases of the cleanup action. Performance monitoring confirms the cleanup action has met cleanup and/or performance standards. Confirmational monitoring confirms the long-term effectiveness of the cleanup action once cleanup standards have been met or other performance standards have been attained.

Alternatives 2 and 3 provide for compliance monitoring, including protection monitoring during excavation and cap construction activities, performance monitoring to confirm that the extents of contamination have been reached in excavations, and monitoring and repair of capped areas after construction is complete. Confirmational monitoring is not possible for these alternatives, as the contaminated areas will be covered by a cap.

Alternative 4 provides for compliance monitoring, including protection monitoring during excavation activities, and performance monitoring to confirm that the extents of contamination have been reached in excavations. Confirmational monitoring is not necessary for this alternative, as all site contamination will be removed.

5.4.2 Other requirements

5.4.2.1 Use of permanent solutions to the maximum extent practicable

As discussed previously, to determine whether a cleanup action uses permanent solutions to the maximum extent practicable, the DCA specified in WAC 173-340-360(3)(e) is used. The DCA compares the costs and benefits of the cleanup action alternatives. The comparison of costs and benefits may be quantitative, but will often be qualitative and require the use of best professional judgment. Table 7 provides a summary of the relative ranking of each alternative in the decision process.

- Protectiveness measures the degree to which existing risks are reduced, the time required to reduce risk and attain cleanup standards, on- and off-site risks resulting from implementing the alternative, and improvement of overall environmental quality.

  Alternative 4 is the most protective, as it removes all contaminated soil on the Site and has a restoration time frame of 1 year. Alternatives 2 and 3 are also protective, as they reduce the risk of direct contact with Site contaminants and migration of contamination to groundwater, although they do not completely remove risk from the Site and require long-term monitoring.

- Permanent reduction of toxicity, mobility, and volume measures the adequacy of the alternative in destroying the hazardous substance(s), the reduction or elimination of releases or sources of releases, the degree of irreversibility of any treatment process, and the characteristics and quantity of any treatment residuals.

Alternative 4 completely removes contamination from the site and is the most permanent. Alternatives 2 and 3 remove some contamination from the site, but do not reduce the volume of contamination at the site as much as Alternative 4.

- Cleanup costs are estimated based on specific design assumptions for each alternative. Although the costs are estimates based on design assumptions that might change, the relative costs can be used for this evaluation. For a basis of the costs involved with each alternative, please refer to the FS.

  Alternative 2 is the least expensive, costing $365,000. Alternative 3 costs $3.3 million, and Alternative 4 costs $38.8 million without shoring and $74.8 million with shoring.

- Long-term effectiveness measures the degree of success, the reliability of the alternative during the period that hazardous substances will remain above cleanup levels, the magnitude of residual risk after implementation, and the effectiveness of controls required to manage remaining wastes.

  Alternative 4 has the highest long-term effectiveness, as it permanently removes all contamination from the site. Alternatives 2 and 3 are less effective over the long term, as each rely on caps that must be monitored and maintained to eliminate exposure pathways to contamination and reduce the likelihood of contaminant migration to groundwater.

- Short-term risk measures the risks related to an alternative during construction and implementation, and the effectiveness of measures that will be taken to manage such risks.

  Alternative 2 has the lowest short-term risk, as it uses the least amount of excavation and construction. Alternatives 3 and 4 have much greater short-term risks as they involve demolition of facility structures, and large amounts of excavation and construction.

- Implementability considers whether the alternative is technically possible, the availability of necessary off-site facilities, services, and materials, administrative and regulatory requirements, scheduling, size, complexity, monitoring requirements, access for operations and monitoring, and integrations with existing facility operations.

  Alternative 2 is the most implementable, as it requires the least amount of off-site facilities, services, and materials, is the least complex, and disturbs existing facility operations the least. Alternative 3, while technically possible, disturbs existing facility operations greatly and requires moderate off-site services and materials, and more complex scheduling. Alternative 4 is the least technically possible, as it disrupts existing facility operations for up to a year, requires large amounts of off-site services and materials, and would be complex to schedule and construct.

- To understand and consider public concerns, Ecology presented the draft RI/FS for public review and comment. This CAP will also undergo public review and comment.

  Ecology did not receive comments for the SemMaterials RI/FS Report. The documents were made available for public comment from March 11, 2013, through April 10, 2013.

5.4.2.2 Provide for a reasonable restoration time frame

WAC 173-340-360(4) describes the specific requirements and procedures for determining whether a cleanup action provides for a reasonable restoration time frame, as required under subsection (2)(b)(ii). The factors used to determine whether a cleanup action provides a reasonable restoration time frame are set forth in WAC 173-340-360(4)(b).

Alternative 4 has the shortest restoration time frame, at one year; however, this alternative is the least practicable of the three alternatives evaluated. Alternatives 2 and 3 both have restoration time frames of 30 years. Although 30 years is not ideal for a restoration time frame, the risks posed by the site to human health and the environment will be minimal after the construction portion of alternatives 2 and 3 are complete, and will be managed using institutional controls. In addition, it is likely that volatization and biodegradation will continue to reduce the concentration of IHSs in soil at the Site.

5.5 Decision

Based on the analysis described above, Alternative 2 has been selected as the proposed remedial action/cleanup action for the Site. Though Alternatives 3 and 4 are more protective, permanent, and effective over the long term, they have much lower implementability, and the costs of these alternatives relative to Alternative 2 outweigh the incremental benefits they provide.

6 Selected Cleanup Action

The selected cleanup action for the site includes the elements detailed in the following sections.

6.1 Cleanup actions

The cleanup actions will include new cap construction; inspection, maintenance, and repair of capped areas; and monitoring well decommissioning.

6.1.1 New cap construction

Construct and maintain an approximate 8,000-square-foot cap in the vicinity of soil borings GGP06, GGP09, and GGP30, and an approximate 800-square-foot cap in the vicinity of soil

boring GGP24. These areas are shown on Figure 5 – Proposed and Existing Cap Areas. The caps will be designed to prevent direct contact with shallow (between ground surface and approximately 15 feet bgs) TPH-, naphthalene-, and cPAH-impacted soil. The caps could consist of clean imported fill, asphalt, or concrete. The cost of a concrete cap is used for the DCA, which is summarized in Section 5.4.2. Note that the cost of the cap used in the DCA was extrapolated from the cost of the cap proposed in Table 9.1 of the FS, and some cost savings from the dollar amount used in this DCA may be possible due to economy of scale. Some contaminated soil may be excavated and removed from the site during cap construction to lower the ground surface so that the cap surface will match the current grade of the site.

6.1.2 Inspection, maintenance, and repair of capped areas

The existing pavement cap in the Northeast Tank Farm Area and the new capped areas in the vicinity of soil borings GGP06, GGP09, GGP30, and GGP24 will be inspected, and any maintenance or repair needed performed, on a yearly basis at minimum. Annual inspection should occur after peak stormwater runoff has occurred in the spring. If natural or anthropogenic events that may damage the cap occur between monitoring events, the cap should be inspected for damage, and repairs made if necessary. After the yearly inspection is performed an annual Maintenance and Repair Report will be submitted to Ecology. The report shall include:

- A summary of the cap inspection activities and the condition of the cap.
- Photographic log of the cap condition.
- Description of any repairs needed and/or performed.

Details of the inspection, maintenance, and repair protocol shall be included in the Maintenance and Repair Plan, to be approved by Ecology with the Engineering Design Plans providing details of the soil excavation and capping conducted during the cleanup action.

6.1.3 Monitoring well decommissioning

Decommission the remaining groundwater monitoring well (GMW-06) in compliance with applicable state regulations.

6.2 Institutional controls

Institutional controls are measures undertaken to limit or prohibit activities that may interfere with the integrity of a cleanup action or result in exposure to hazardous substances at the Site. Such measures are required to assure both the continued protection of human health and the environment and the integrity of the cleanup action whenever hazardous substances remain at the Site at concentrations exceeding applicable CULs. Institutional controls can include both physical measures and legal and administrative mechanisms. WAC 173-340-440 provides information on institutional controls, and the conditions under which they may be removed.

Institutional controls for the site will include the following:

- Maintenance of existing site security measures, including fencing, to limit trespassing and unauthorized access. If site use changes, site security measures may be re-evaluated and modified with Ecology's approval.
- Inspection, maintenance and repair of capped areas on the site conducted at a minimum yearly, or as-needed if damage to the cap is observed.
- An environmental covenant that restricts subsurface disturbances and/or activities in areas with documented TPH-, naphthalene-, or cPAH-impacted soil, and non-industrial Site use unless additional analysis and cleanup actions are completed. The draft covenant shall be submitted to Ecology for review, and the final covenant filed as described in the Scope of Work and Schedule in the Consent Decree.
- Educational programs such as signs, postings, or other communications to educate employees and Site visitors about Site contamination and ways to limit exposure. These programs shall be implemented within 60 days of finalization of this CAP.

6.3 Periodic review

As long as CULs have not been achieved, WAC 173-340-420 states that at sites where a cleanup action requires an institutional control, a periodic review shall be completed no less frequently than every five years after the initiation of a cleanup action. Additionally, periodic reviews are required at sites that rely on institutional controls as part of the cleanup action.

The selected cleanup action includes institutional controls; therefore, a periodic review will be required five years after the initiation of the cleanup action, and every five years thereafter, unless Ecology determines a periodic review is no longer warranted.

7 References

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ERM-West, Inc., 2019, *SemMaterials L.P. Monitoring Well Decommissioning Report*. December 11, 2019.

Molenaar, D., 1988, *The Spokane Aquifer, Washington: Its Geologic Origin and Water-Bearing and Water-Quality Characteristics*. U.S. Geological Survey Water-Supply Paper 2265.

Table 1

Summary of Soil Data

Site Area	Explorations	Depth (feet bgs)	Number of soil samples	Number of Samples with Exceedances	Petroleum Hydrocarbons (mg/kg)				Naphthalenes (mg/kg)				Non-carcinogenic PAHs (mg/kg)								cPAHs (mg/kg)							
					Diesel Range Organics	Diesel Extended Range	Oil Range Organics	Total Diesel Range	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Total naphthalenes	Acenaphthene	Acenaphthylene	Anthracene	Benzo(ghi)perylene	Fluoranthene	Fluorene	Phenanthrene	Pyrene	Benz[a]anthracene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total cPAHs as benzo(a)pyrene
Northeast Tank Farm	13 soil borings 5 test pits	10-125	64	36	X	X																						
North Tank Farm	4 soil borings	16	4	0	X		X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
North of Site	12 soil borings	7-197	21	4	X		X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Southeast Corner of Site	2 soil borings	16	4	0	X		X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
South-Central Portion of Site	16 soil borings	16	32	4	X		X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
West Portion of Site	10 soil borings	12-193	37	12	X		X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

X = at least one sample in specified Site Area was analyzed for this contaminant

= exceedance of cleanup level in at least one sample

bgs = below ground surface
mg/kg = milligrams per kilogram
VOCs = volatile organic carbons
PAHs = polycyclic aromatic hydrocarbons
cPAHs = carcinogenic polycyclic aromatic hydrocarbons

Table 2

Soil Analyte Detection Frequency

Analyte	Total Samples	Number of Detections	Detection Frequency	Maximum Concentration (mg/kg)
TPH	127	87	69%	51,700
cPAHs	44	5	11%	5.2
Naphthalenes	44	8	18%	158

mg/kg = milligrams per kilogram
TPH = total petroleum hydrocarbons
cPAHs = carcinogenic polycyclic aromatic hydrocarbons

Table 3

Groundwater Analyte Detection Frequency

Analyte	Total Samples	Number of Detections	Detection Frequency	Maximum Concentration (µg/L)
TPH	51	13	25%	560[1]
cPAHs	51	8	16%	0.0115
Naphthalenes	51	0	0%	ND

µg/L = micrograms per liter
TPH = total petroleum hydrocarbons
cPAHs = carcinogenic polycyclic aromatic hydrocarbons

1. In general, the sample chromatographic pattern of samples from UDCMW-4, the well where samples exceeded cleanup levels, does not resemble the fuel standard used for quantification. See Section 3.2 of the Cleanup Action Plan for additional information.

Table 4

Soil Cleanup Level Evaluation

Analyte	Maximum Concentration (mg/kg)	MTCA A Industrial (mg/kg)	MTCA C Carcinogen (mg/kg)	MTCA C Non-carcinogen (mg/kg)	Present in Groundwater	Final CUL (mg/kg)	Basis
Petroleum Hydrocarbons							
Diesel Range Organics	20600	**2000**	--	--	Yes	**2000**	**Method A Industrial CUL**
WTPH-418.1	31100	--	--	--	Yes		No MTCA criteria
Lube Oil	13000	**2000**	--	--	Yes	**2000**	**Method A Industrial CUL**
cPAHs							
Benz[a]anthracene	9.5	--	--	--	Yes		See footnote 1
Benzo(b)fluoranthene	3.2	--	--	--	Yes		See footnote 1
Benzo(k)fluoranthene	4	--	--	--	No		See footnote 1
Benzo(a)pyrene	4	**2**	130	1100	No	**2**	**Method A Industrial CUL**
Chrysene	16	--	--	--	Yes		See footnote 1
Indeno(1,2,3-cd)pyrene	1.3	--	--	--	Yes		See footnote 1
Total cPAHs as Benzo(a)pyrene[1]	5.2	**2**	130	1100	Yes	**2**	**Method A Industrial CUL**
Naphthalenes							
Naphthalene	9.3	**5**[2]	--	7000	No	**5**[2]	**Method A Industrial CUL**
2-Methylnaphthalene	86	--	--	14000	NT		< Method C CUL (Non-carcinogenic)
1-Methylnaphthalene	63	--	4500	250000	NT		< Method C CUL (carcinogenic)

-- = no established cleanup level

mg/kg = milligrams per kilogram
MTCA = Model Toxics Control Act
CUL = cleanup level
WTPH = Washington State Total Petroleum Hydrocarbons (lab test method)
cPAHs = carcinogenic polycyclic aromatic hydrocarbons
NT = not tested

1. Cleanup level calculated as benzo(a)pyrene using the toxic equivalency methodology described in WAC 173-340-708(8)
2. Cleanup level for naphthalenes is a total value for naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene

Table 5

Groundwater Cleanup Level Evaluation

Analyte	Maximum Concentration	WA Primary MCL	WA GW Quality Standard	MTCA Cancer Risk at MCL	MTCA Hazard Quotient at MCL	Is MCL Protective?	Adjusted MCL	MTCA A	MTCA B Carcinogenic	MTCA B Non-Carcinogenic	Final CUL	Basis
	µg/L						µg/L					
Petroleum Hydrocarbons												
Diesel Range Organics	270	--	--	--	--	--	--	500	--	--		< Method A CUL
Oil Range Organics	350	--	--	--	--	--	--	500	--	--		< Method A CUL
TPH	560[1]	--	--	--	--	--	--	**500**	--	--	**500**	**Method A CUL**
cPAHs												
Benz[a]anthracene	0.054	--	--	--	--	--	--	--	--	--		No MTCA criteria
Benzo(b)fluoranthene	0.023	--	--	--	--	--	--	--	--	--		No MTCA criteria
Chrysene	0.042	--	--	--	--	--	--	--	--	--		No MTCA criteria
Indeno(1,2,3-cd)pyrene	0.027	--	--	--	--	--	--	--	--	--		No MTCA criteria
Total cPAHs as Benzo(a)pyrene	0.0115	0.2	0.008	8.70E+04	0.018	No	**0.23**	0.1	0.023	11		< Adjusted MCL
Non-carcinogenic PAHs												
Acenaphthene	0.021	--	--	--	--	--	--	--	--	960		< Method B
Anthracene	0.012	--	--	--	--	--	--	--	--	4800		< Method B
Benzo(ghi)perylene	0.024	--	--	--	--	--	--	--	--	--		No MTCA criteria

-- = no established cleanup level

Table 6

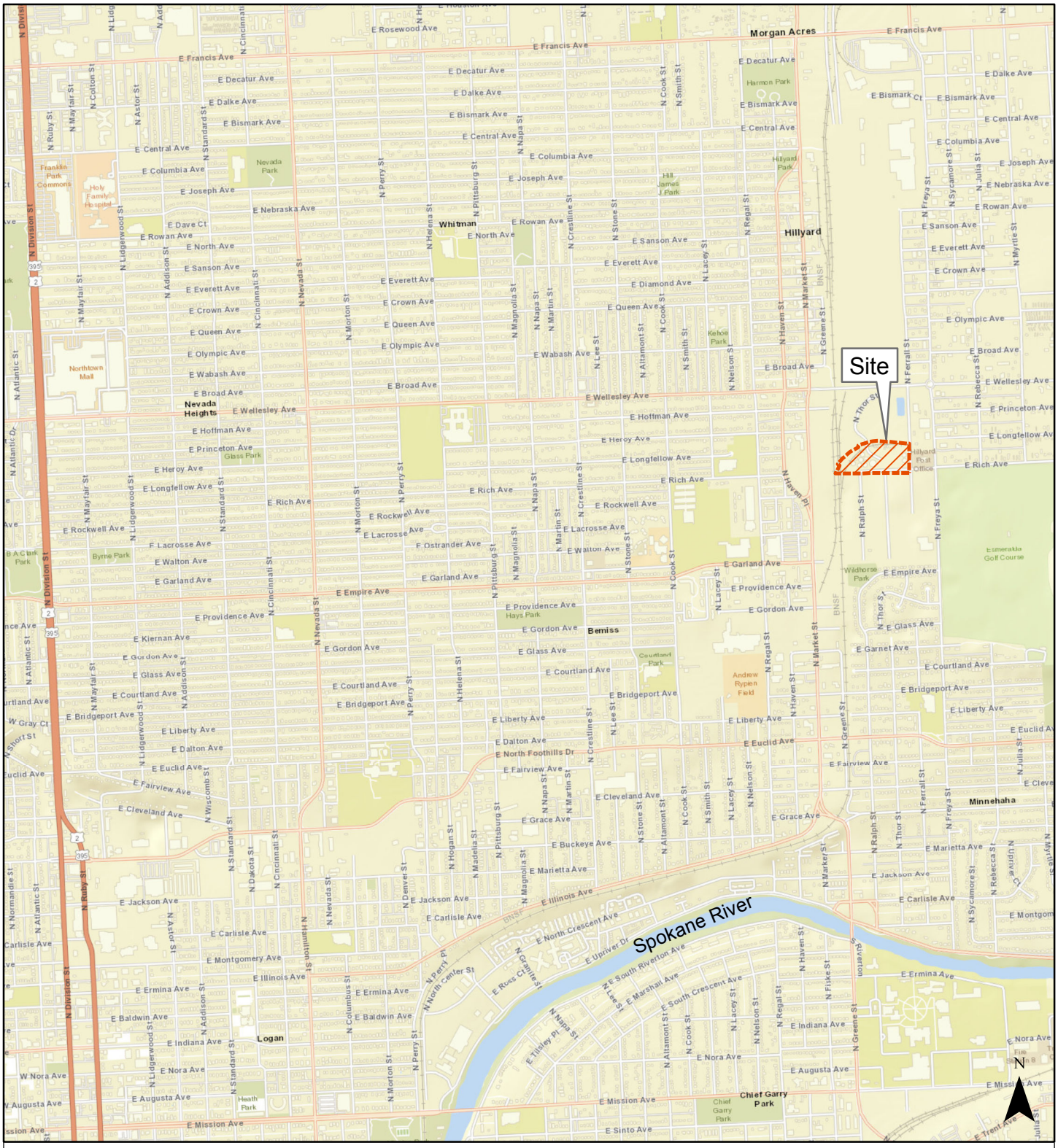
Applicable or Relevant and Appropriate Requirements

Cleanup Action Implementation	
Ch. 70.105D RCW; Ch. 173-340 WAC	Model Toxics Control Act; MTCA Cleanup Regulation
Ch. 43.21C RCW; Ch. 197-11 WAC SMC 10.08D	State Environmental Policy Act; SEPA Rules Spokane Municipal Code Chapter 10.08D - Noise Control
29 CFR 1910	Occupational Safety and Health Act
Groundwater and Surface Water	
42 USC 300	Safe Drinking Water Act
33 USC 1251; 40 CFR 131; Ch. 173-201A WAC	Clean Water Act of 1977; Water Quality Standards
Ch. 70.105D RCW; Ch. 173-340 WAC	Model Toxics Control Act; MTCA Cleanup Regulation
40 CFR 141; 40 CFR 143	National Primary Drinking Water Standards; National Secondary Drinking Water Standards
Ch. 246-290 WAC	Department of Health Standards for Public Water Supplies
Ch. 173-154 WAC	Protection of Upper Aquifer Zones

Table 7

Alternatives Evaluation

Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	Completed remedial actions (bioventing of soil and capping in NE tank farm area)	Cap central and northern areas, environmental covenant	Demo and removal of existing facilities and contaminated soil up to 15 feet bgs, cap NE tank farm area and North area, environmental covenant	Demo and removal of existing facilities and all contaminated soil
Threshold Requirements				
Protection of human health & environment	no	yes	yes	yes
Compliance with cleanup standards	no	yes	yes	yes
Compliance with state & federal laws	no	yes	yes	yes
Provision for compliance monitoring	no	yes	yes	yes
Compliant with MTCA Threshold Requirements?	**no**	**yes**	**yes**	**yes**
Other Requirements				
Restoration Time Frame	0 years	30 years	30 years	1 year
Consider Public Comments	no	yes	yes	yes
Use of Permanent Solutions (Disproportionate Cost Analysis ranking)				
Protectiveness	1	2	3	4
Permanent Reduction	1	1	3	4
Long-term Effectiveness	1	2	3	4
Short-term Risk	4	3	2	1
Implementability	4	3	2	1
Consider Public Concerns	no	yes	yes	yes
Total Score	**11**	**11**	**13**	**14**
Disproportionate Cost Analysis				
Cleanup Cost (estimated)	$0	$365,000	$3.3 million	$38.8/74.8 million
Benefit Score (total DCA score x 1,000,000/cost)	0	30	3.93	0.36/0.19
Overall Ranking	**4**	**1**	**2**	**3**



DEPARTMENT OF ECOLOGY
State of Washington

Site Vicinity Map

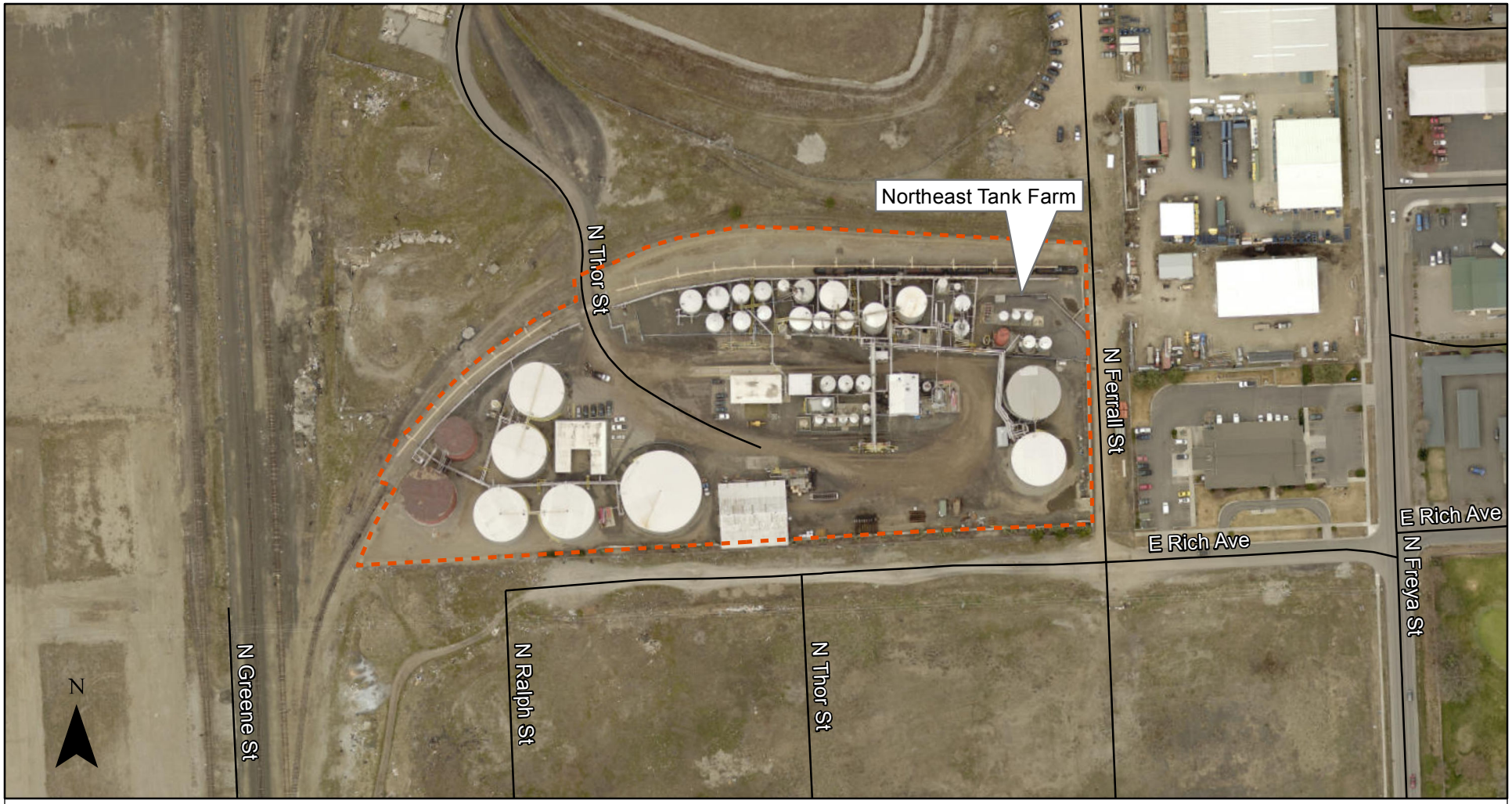
SemMaterials LP Spokane Site
Spokane, Washington

May 27, 2020 | **Figure 1**

Note: Feature locations are approximate

Coordinate System: NAD 1983 HARN StatePlane Washington North

Data Source: Esri basemap data, Garmin basemap layers, U.S. Geological Survey elevation data, Intact Forest Landscape, HERE data



Legend

Site Boundary

Streets

0 100 200 400

Feet

Note: Feature locations are approximate

Coordinate System: NAD 1983 HARN StatePlane Washington North

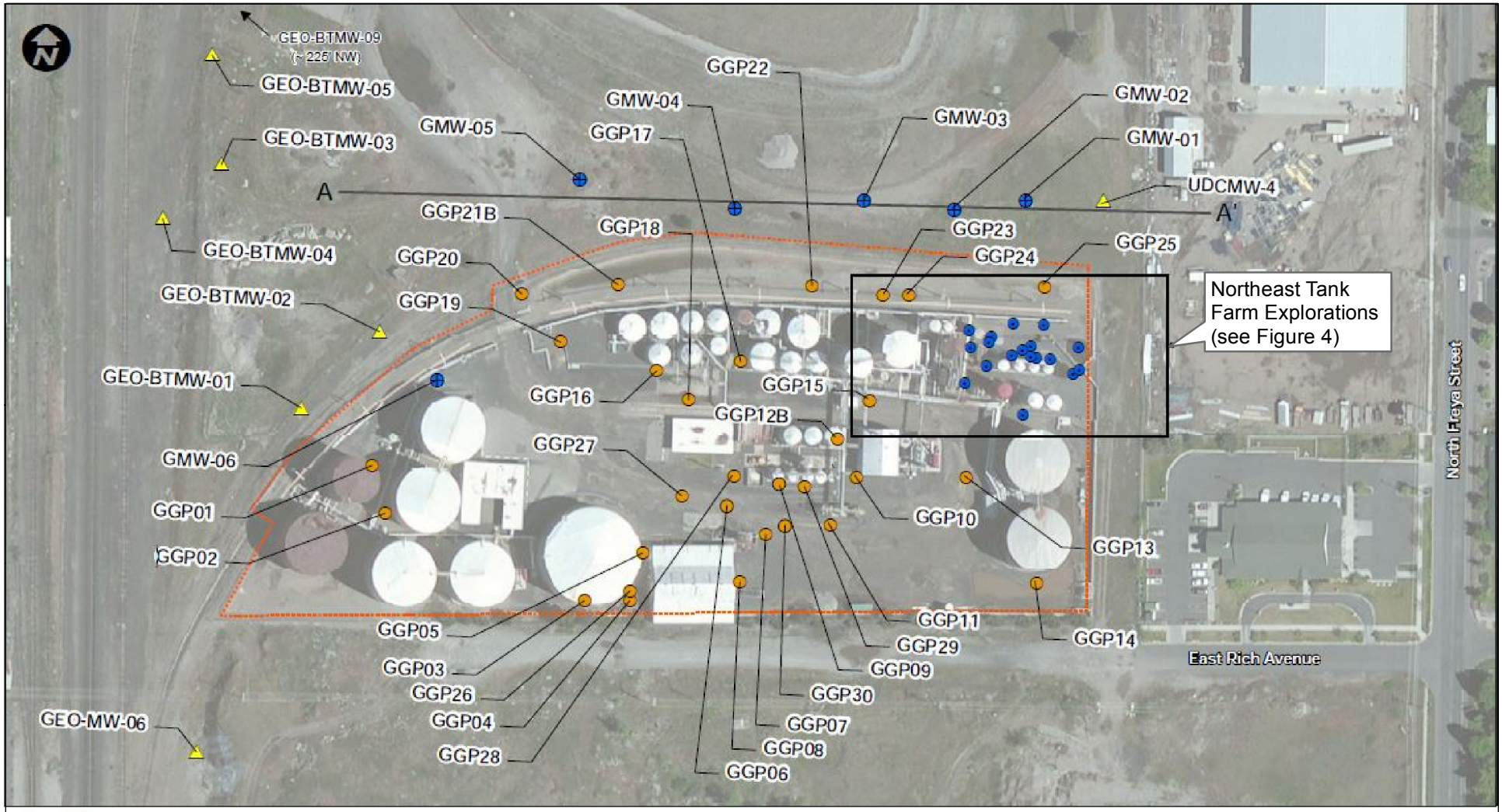
Data Source: Esri basemap data, Garmin basemap layers, U.S. Geological Survey elevation data, Intact Forest Landscape, HERE data

DEPARTMENT OF ECOLOGY
State of Washington

Site Plan

SemMaterials LP Spokane Site
Spokane, Washington

May 27, 2020 | **Figure 2**



LEGEND

- 2009 Direct-Push Boring
- Site Monitoring Well
- Off-Site Monitoring Well
- Pre-2009 Soil Sample Location
- Geologic Cross Section
- Site Boundary

0 25 50 100 150 200

Feet

Note: Feature locations are approximate

Coordinate System: NAD 1983 UTM Zone 11N

Data Source: Aspect Consulting Figure 2.4 "Site-wide Previous Explorations" from SemMaterials L.P. Spokane Site Remedial Investigation/Feasibility Study Report dated January 31, 2013.

DEPARTMENT OF ECOLOGY
State of Washington

Site Explorations

SemMaterials LP Spokane Site
Spokane, Washington

May 26, 2020 | **Figure 3**

LEGEND

- 2009 Direct-Push Boring
- Pre-2009 Soil Sample Location
- Site Boundary

0 12.5 25 50 75 100

Feet

DEPARTMENT OF ECOLOGY
State of Washington

Northeast Tank Farm Explorations

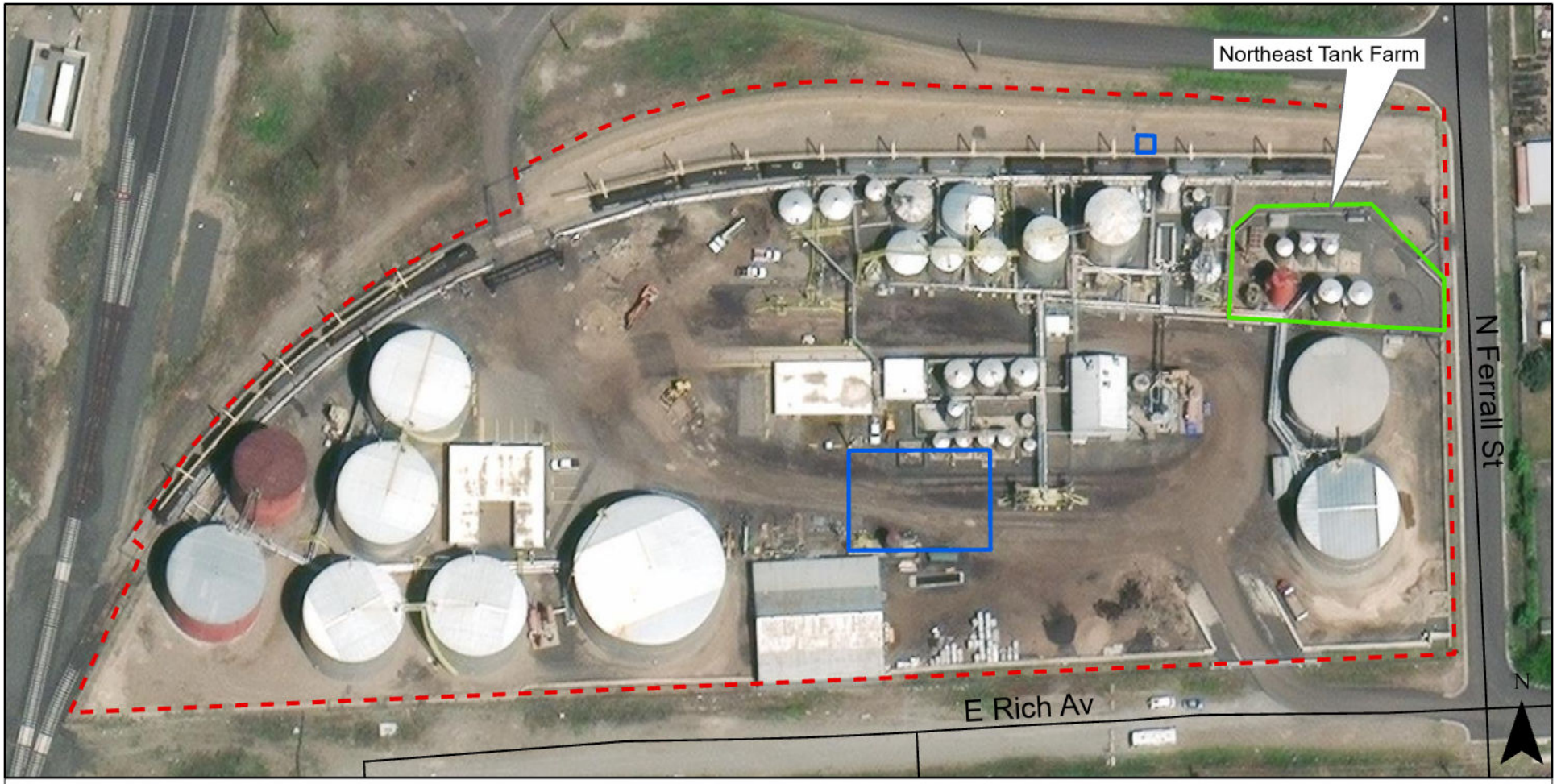
SemMaterials LP Spokane Site
Spokane, Washington

May 26, 2020 | **Figure 4**

Note: Feature locations are approximate

Coordinate System: NAD 1983 UTM Zone 11N

Data Source: Aspect Consulting Figure 2.5 "Northeast Tank Farm Previous Explorations" from SemMaterials L.P. Spokane Site Remedial Investigation/Feasibility Study Report dated January 31, 2013.



Legend

- Approximate Proposed Cap Areas
- Existing Cap Area
- Site Boundary
- Street

0 50 100 200

Feet

Note: Feature locations are approximate

Coordinate System: NAD 1983 HARN StatePlane Washington North

Data Source: U.S. Geological Survey, Esri, Maxar, Earthstar Geographics, City of Spokane, Spokane County, Bureau of Land Management, HERE, Garmin, GeoTechnologies, Inc., EPA|Esri, and the GIS User Community

DEPARTMENT OF ECOLOGY
State of Washington

Proposed and Existing Cap Areas

SemMaterials LP Spokane Site
Spokane, Washington

September 30, 2022

Figure 5

Appendices

Appendix A

Terrestrial Ecological Evaluation

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation.

Completion of this form is not sufficient to document your evaluation. You still need to document your analysis and the basis for your conclusion in your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Terrestrial-ecological-evaluation.

Step 1: IDENTIFY HAZARDOUS WASTE SITE	
Please identify below the hazardous waste site for which you are documenting an evaluation.	
Facility/Site Name: SemMaterials LP Spokane	
Facility/Site Address: 4327 N Thor Street, Spokane, WA 99217	
Facility/Site No: 16655424	VCP Project No.:

Step 2: IDENTIFY EVALUATOR			
Please identify below the person who conducted the evaluation and their contact information.			
Name: Katie Larimer		Title: Environmental Engineer	
Organization: Washington State Department of Ecology			
Mailing address: 4601 N Monroe Street			
City: Spokane	State: WA	Zip code: 99205	
Phone: 509-329-3419	Fax: 509-329-	E-mail: khal461@ecy.wa.gov	

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

☑ Yes *If you answered **"YES,"** then answer **Question 2**.*

☐ No or Unknown *If you answered **"NO" or "UNKNOWN,"** then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? *Check all that apply. Then skip to **Step 4** of this form.*

Point of Compliance: WAC 173-340-7491(1)(a)

☐ All soil contamination is, or will be,* at least 15 feet below the surface.

☐ All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

☑ All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

☐ There is less than 0.25 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

☐ For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

☐ Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

[±] "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

[#] "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.

1. Does the Site qualify for a simplified evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No or Unknown *If you answered **"NO"** or **"UNKNOWN,"** then skip to **Step 3C** of this form.*

2. Did you conduct a simplified evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 3** below.*

☐ No *If you answered **"NO,"** then skip to **Step 3C** of this form.*

3. Was further evaluation necessary?

☐ Yes *If you answered **"YES,"** then answer **Question 4** below.*

☐ No *If you answered **"NO,"** then answer **Question 5** below.*

4. If further evaluation was necessary, what did you do?

☐ Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*

☐ Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

5. If no further evaluation was necessary, what was the reason? *Check all that apply. Then skip to **Step 4** of this form.*

Exposure Analysis: WAC 173-340-7492(2)(a)

☐ Area of soil contamination at the Site is not more than 350 square feet.

☐ Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

Pathway Analysis: WAC 173-340-7492(2)(b)

☐ No potential exposure pathways from soil contamination to ecological receptors.

Contaminant Analysis: WAC 173-340-7492(2)(c)

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. *See* WAC 173-340-7493(1)(c).

1. Was there a problem? *See* WAC 173-340-7493(2).

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No *If you answered **"NO,"** then identify the reason here and then skip to **Question 5** below:*

- ☐ No issues were identified during the problem formulation step.
- ☐ While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? *See* WAC 173-340-7493(3).

- ☐ Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*
- ☐ Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

3. If you conducted further site-specific evaluations, what methods did you use?
Check all that apply. See WAC 173-340-7493(3).

- ☐ Literature surveys.
- ☐ Soil bioassays.
- ☐ Wildlife exposure model.
- ☐ Biomarkers.
- ☐ Site-specific field studies.
- ☐ Weight of evidence.
- ☐ Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

- ☐ Confirmed there was no problem.
- ☐ Confirmed there was a problem and established site-specific cleanup levels.

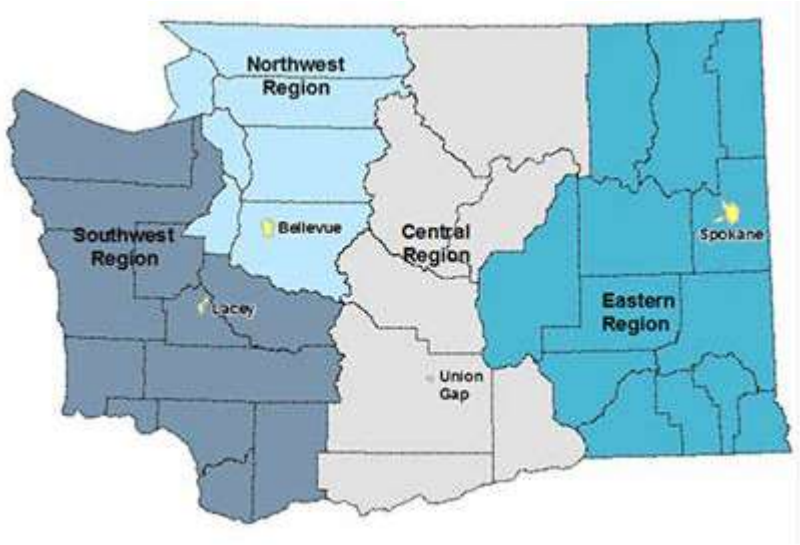
5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?

☐ Yes If so, please identify the Ecology staff who approved those steps:

☐ No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



Northwest Region: Attn: VCP Coordinator 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: VCP Coordinator 1250 West Alder St. Union Gap, WA 98903-0009
Southwest Region: Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295

If you need this publication in an alternate format, please call the Toxics Cleanup Program at 360-407-7170. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call 877-833-6341.