Former Park Laundry
122 N Main Avenue
Ridgefield, Washington 98642

Facility Site ID: 8100630
Cleanup Site ID: 4099

Public Review Draft Cleanup Action Plan

Issued by

Washington State Department of Ecology
Toxics Cleanup Program
Southwest Regional Office
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CONTENTS

TABLES

FIGURES

ACRONYMS AND ABBREVIATIONS

1,1-DCE	1,1-dichloroethene
ARARs	Applicable or Relevant and Appropriate Requirements
bgs	below ground surface
CAP	Cleanup Action Plan
CD	Consent Decree
cis-1,2-DCE	cis-1,2-dichloroethene
COC	Contaminant of Concern
CUL	Cleanup Level
EC	Environmental Covenant
Ecology	Washington State Department of Ecology
EDR	Engineering Design Report
ICs	Institutional Controls
LWBZ	lower water-bearing zone
MCLs	Maximum Contaminant Levels
MFA	Maul Foster & Alongi, Inc.
MTCA	Model Toxics Control Act
PCE	tetrachloroethene
PLP	potentially liable persons
POCs	points of compliance
Port	Port of Ridgefield
PQLs	Practical Quantitation Levels
Property	Former Park Laundry located at 122 North Main Avenue in Ridgefield, Washington
PWT	Pacific Wood Treating facility
QAPP	Quality Assurance Project Plan
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
REL	Remediation Level
RI/FS	Remedial Investigation/Feasibility Study
SAP	Sampling and Analysis Plan
SEPA	State Environmental Policy Act
Site	The extent of Property-related contamination, which corresponds to the extent of groundwater contamination.
Source Area	The Property and the two vacant lots directly north of the Property and a portion of the parcel to the south
trans-1,2-DCE	trans-1,2-dichloroethene
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
UIC	underground injection control
URIC	Union Ridge Investment Company
UWBZ	upper water-bearing zone
VC	vinyl chloride
VOCs	volatile organic compounds
WAC	Washington Administrative Code

EXECUTIVE SUMMARY

This document presents the cleanup action plan (CAP) for the Former Park Laundry site in Ridgefield, Washington. This CAP is intended to meet the requirements of the Model Toxics Control Act administered by the Washington State Department of Ecology (Ecology) under chapter 173-340 of the Washington Administrative Code (WAC). This CAP describes Ecology's required cleanup action for the Site and sets forth the requirements that the cleanup must meet.

Soil, vapor, and groundwater impacts related to tetrachloroethene (PCE) and its degradation products resulting from former dry cleaner operations have been confirmed. The groundwater plume covers an estimated 22 acres. The plume generally follows the topography of the area, extending north and west from the Property, and is bounded on the west by Lake River. This CAP addresses the potential human health and environmental concerns associated with these impacts, based on Ecology's selected remedy (Alternative 4) from the Remedial Investigation/Feasibility Study (RI/FS) analysis conducted by Maul Foster & Alongi, Inc. (MFA, 2019).

The selected remedy consists of soil excavation down to 15 feet below ground surface (bgs) in the groundwater Source Area (including the former Park Laundry property, a City of Ridgefield parcel, and two privately owned [Hinrich] parcels), focused groundwater remediation, institutional controls, and groundwater monitoring. If contamination remains in the Source Area and it is redeveloped, a vapor barrier should be included, as part of building construction, or additional data should be collected to show that there is no threat to indoor air.

1.0 INTRODUCTION

2.0 SITE DESCRIPTION

2.1 Property and Site Description

The Property is zoned as Downtown Mixed Use and is approximately 25 feet wide (north-south) and 100 feet long (east-west). The Property is located near commercial businesses or publicly owned entities (e.g., police and fire station). Beyond these, the land use is primarily residential.

The contaminated groundwater plume covers an estimated 22 acres. The plume generally follows the topography of the area—extending north and west from the Property, and is bounded on the west by Lake River. Soil impacts and soil vapor are within the extent of the groundwater impact. Figure 1-2 depicts the estimated Site boundary as defined by the RI.

For the purposes of this CAP, "the Source Area" is defined as the area of the Site with the highest concentrations in soil, groundwater, and soil vapor; this includes the Property and the adjoining parcels to the north and south of the Property. Immediately to the north are two vacant and privately owned (Hinrich) parcels. These parcels and the Property are presently used as a parking lot. To the south, contamination extends into the northern portion of a parcel which is owned by the City of Ridgefield and is used as a parking lot.

Groundwater contamination sourced from the Park Laundry Site has entered the Port of Ridgefield's (Port's) property, which is subject to a separate Consent Decree (CD) (Ecology, 2013), and CAP for contamination from the former Pacific Wood Treating (PWT) facility. There are two separate plumes of VOC contaminated groundwater at the Port property. The northern plume is sourced from PWT operations and generally located north of Division Street on the Port property. The southern plume is sourced from the Park Property and generally located south of Division Street on the Port property.

With the groundwater flow from the Park Property towards Lake River, CULs protective of surface water in monitoring wells on the bank of Lake River (MW-29D, MW-47D and MW-46D) have been established.

2.2 Site Topography, Geology, and Hydrogeology

The Site topography consists of upper and lower terrace areas trending north and south. A west-facing slope separates them. The Source Area is located on the upper terrace where City of Ridgefield commercial properties reside with some residential properties. The slope starts west of North 1st Avenue dropping from about 80 feet to 20 feet in elevation over a horizontal distance of about 250 feet before arriving at the lower terrace. The slope is covered with residential properties. The lower terrace is Port of Ridgefield property that is bare undeveloped land and the location of the former PWT operations area. Lake River borders the west side of the lower terrace.

The Site is underlain by Holocene to Tertiary age alluvial deposits (see Figures 1-2 and 2-1). Two water-bearing zones beneath the site are separated by an aquitard. The upper water-bearing zone (UWBZ) overlies the aquitard. It consists of Pleistocene age silty sand and sand that make up the surface deposits of the upper terrace and most of the slope between terraces. The silty sand and sand grades into a sandy gravel unit beneath the western portion of the slope and the lower terrace. Holocene age deposits of silt, sand and silty sand overlay the sandy gravel to make up the surface deposits of the lower terrace.

The aquitard beneath the UWBZ consists of clay and silty gravel. The clay portion is about 40 feet thick, is in contact with, and overlies the silty gravel portion. The clay portion pinches out to the west only being found beneath the upper terrace and part of the slope between the terraces. The clay portion is considered Pleistocene in age while the underlying silty gravel is thought to be Tertiary age. The silty gravel unit extends beneath the entire site.

Beneath the clay and silty gravel aquitard is the Tertiary age lower water-bearing zone (LWBZ). It consists of some sand and sandy gravel extending beneath the entire Site.

Groundwater flow in the upper terrace is to the north, northwest and turns to the west to follow topographic slope to the lower terrace and Lake River. Groundwater elevation data from Site monitoring wells show that groundwater flow is consistent season to season. The clay aquitard is unsaturated and shallow groundwater is perched above that clay. The perched groundwater is considered non-potable due to insufficient flow and shallow depth (15 to 19 feet bgs). The shallow depth would not allow for meeting surface seal minimum well construction standards. Beyond where the clay pinches out, groundwater transitions from non-potable to potable. Groundwater flow direction beneath the Port property is consistently east to west in the UWBZ. There are no monitoring wells in the LWBZ unit so groundwater flow direction is not known there.

The groundwater contaminant extent in the Source Area and upper terrace is defined, being contained above the clay aquitard. Downslope to the west, contamination has entered the sandy gravel above the silty gravel aquitard. Because the vertical extent of contamination through the silty gravel aquitard is unknown, Ecology is requiring at least three additional monitoring wells in the underlying sandy gravel unit of the LWBZ.

Conservative groundwater modeling conducted for the Port of Ridgefield by MFA indicates groundwater flow in the UWBZ is towards Lake River. Reportedly, PCE concentrations in groundwater would attenuate to levels below the most stringent regulatory criteria (surface-water CULs) before discharging to Lake River. However, Ecology is not sure this is the case and to be most protective it considers the soil leaching to groundwater pathway and groundwater to surface water pathways complete.

Ecology determined that because contaminated groundwater from the non-potable portion of the Site migrates to groundwater that is potable, groundwater throughout the Site is considered potable.

2.3 Site History

Park Laundry operated on the Property from approximately 1965 to 1977. The former owner/operator, Mr. Alvin Johnson, is deceased. The laundry service is believed to have included dry-cleaning services and self-service, coin-operated washers and dryers. Park Laundry's operations had ceased by 1978 when Union Ridge Investment Company (URIC) purchased the Property on May 31, 1979. There was no dry-cleaning equipment in the building at the time of purchase. The Property was sold to Mr. Larry Beaman on February 15, 2000. Mr. Beaman removed the building and subsequently defaulted on his obligations. The Property was quitclaimed to Mr. Robert Hyatt, representing URIC, who then quitclaimed the Property to URIC on November 19, 2007. Mr. Hyatt was the last surviving member of the URIC until he passed in 2019.

A parking lot used by the Ridgefield Police Department and owned by the City of Ridgefield is located along the southern border of the Property. To the east is a one-lane, paved alleyway, bordered by a city skate park and fire station. To the west is North Main Avenue and a food and drink establishment owned by MRS Development, LLC. To the north are two vacant lots owned by Frankie Rima-Hinrich (Clark County GIS, 2016).

MFA reviewed state and federal agency database records, aerial photographs, and Sanborn Fire Insurance Maps for historical information related to the Property to evaluate the area for other potential sources of contamination (MFA, 2011a). Based on MFA's review of state and federal agency records, petroleum-hydrocarbon contamination has been confirmed on nearby properties; however, it is not a chemical of interest for the Park Laundry Site. No other sources of PCE were identified.

2.4 Human Health and Environmental Concerns

The RI/FS report (MFA, 2019) provides a detailed summary of the remedial investigation and previous investigation results and is referenced for detailed information regarding the nature and extent of contaminants and the risk associated with those contaminants. PCE and its possible degradation products are contaminants of concern for the Park Laundry Site.

Soil investigations were conducted in 2010 and 2011 to delineate the nature and extent of soil impacts (MFA, 2010c; 2011a,b). The lateral extent of soil impacts down to 15 feet bgs is generally confined to the Property and the adjoining Hinrich parcels. PCE is also found in a small area of shallow soil on a parcel owned by the City of Ridgefield south and adjoining the Property (see Figure 2-2).

The extent of groundwater impacts has been delineated in the UWBZ, with the exception of monitoring well MW20 to the south of the site; representative concentrations from 2018 and 2019 are shown on Figure 2-3.

An investigation conducted in 2012- 2013 with oversight from Ecology and the Washington State Department of Health demonstrated that vapor intrusion is not a pathway of concern for the Site, except in the event that a building be constructed in the Source Area, absent remediation.

If contamination remains in the Source Area and it is redeveloped, a vapor barrier should be included as part of building construction or additional data should be collected to demonstrate that there is no risk to indoor air. The following are considered as complete exposure pathways at the Site:

- Ingestion or dermal contact by Source Area workers of contaminated soil or groundwater.
- Incidental inhalation of vapors and or dust by Source Area workers from contaminated soil.
- Inhalation of solvent vapors by Source Area workers from contaminated groundwater.
- Contaminant uptake by aquatic life and humans from fish consumption.
- Potential for indoor air inhalation of VOCs volatilizing from Source Area soil or groundwater to any new building constructed at the Source Area.

2.5 Cleanup Standards

2.5.1 Contaminants of Concern

Contaminants of concern (COCs) include trichloroethene (TCE) and PCE. These compounds were selected as COCs based on screening analytical data obtained from groundwater and soil sampling that had concentrations above applicable MTCA CULs.

2.5.2 Cleanup Levels

CULs are selected to be protective of the human health and environment for each media. CULs are provided for PCE and TCE as well as for natural degradation products of PCE and TCE; 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE) and vinyl chloride (VC). VC has been detected in groundwater but not in soil. Compounds other than PCE and TCE have not been detected in Site soil or groundwater, except VC in groundwater, but might appear at some time in the future from PCE and TCE breakdown. There is the potential for contaminants to leach from soil into groundwater at the Source Area. Groundwater flow direction is from the Source Area towards Lake River. CULs are derived to be protective of soil to groundwater to surface water. Site CULs are included on Table 2-1. CULs for impacted media are discussed below:

- Soil: Final CULs for unsaturated and saturated soil are based on protection of potable water and for leaching from soil to groundwater to surface water. When the CULs are lower than the Practical Quantitation Levels (PQLs) those CULs have been adjusted to the PQL. All selected CULs for soil have been found to have a cumulative excess cancer risk of less than 1 in 100,000 (1.0×10^{-5}) and a combined noncancer hazard index (HI) of less than 1.

- Groundwater: Final CULs are based on MTCA Method B, the State/Federal Maximum Contaminant Levels (MCLs), Title 40 CFR 131.45, WAC 173-201A, and the Federal Clean Water Act 304. When the CULs are lower than PQLs those CULs have been adjusted to the

PQL. All selected CULs for groundwater have been found to have a cumulative excess cancer risk of less than 1 in 100,000 (1.0 x 10-5). The combined noncancer HI for the selected groundwater CULs exceeds an acceptable HI of 1 but meets the MTCA target threshold of 1 when segregated by target organ.

2.5.3 Remediation Levels

An REL of 0.05 mg/kg in soil was selected to guide the removal of soil containing PCE in the Source Area at the Site. Removal of this material will aid in and increase site-wide degradation of COCs below proposed CULs (Section 2.5.3) via soil excavation and *in situ* groundwater treatment. Approximate proposed excavation extents and in-situ groundwater treatment through injections can be found in Figure 4.1. Final excavation extents will be defined in forthcoming Engineering Design Report (EDR) upon completion of pre-design sampling.

3.0 EVALUATION OF CLEANUP ACTION ALTERNATIVES

3.1 Technology Screening

A preliminary screening of applicable technologies was completed based on technologies discussed in the Federal Remediation Technologies Roundtable Screening Matrix as well as on commonly used industry remediation methods. A number of cleanup techniques are viable to reduce the contaminant levels and reduce toxicity and exposure risk in the areas of highest contaminant concentrations. This in turn will allow natural processes to degrade contaminants where active cleanup actions are not practical. Technologies determined to be effective and implementable were retained for further consideration in the selection of a cleanup alternative:

Natural Attenuation

Natural attenuation, to the extent to which it is occurring on site, is considered; however, it is not fully relied on for Site cleanup. Several studies have indicated that concentrations of PCE and other chlorinated solvents are reduced by reductive dechlorination under anaerobic conditions; however, there is limited evidence for anaerobic biodegradation of chlorinated organics via natural attenuation (USEPA, 1998). A preliminary analysis of natural attenuation, conducted by MFA (Section 4.2.4), showed limited evidence of natural attenuation. That said, decreases in Source Area concentrations will promote decreases in down gradient concentrations as a result of dispersion.

Excavation and Off-Site Disposal

Excavation would remove from the Property all or some of the soil exceeding CULs or REL. Excavated material would be transported to a permitted, off-Site disposal facility.

In Situ Groundwater Treatment

In situ groundwater treatment remediates the groundwater in place. Chlorinated solvents are reduced by reductive dechlorination and biodegradation. Chemical breakdown is enhanced by healthy microorganism populations that occur naturally in the subsurface and coupled with chemical compounds to enhance microorganism reproduction and growth. The *in situ* groundwater treatment introduces the chemical and biological compounds into the contaminant plume, often by injection, to reduce the contaminant concentrations. This process is often cost effective and more easily implementable than other remedial technologies. Implementation of this technology does not guarantee that concentration levels will be reduced to CULs.

Institutional Controls

Institutional controls (IC) (e.g., a restrictive covenant) may be required to reduce or limit future exposure of receptors to soil and groundwater containing residual COCs at concentrations above relevant CULs. Deed notifications inform potential purchasers of the presence of COCs in soil, soil gas, and/or groundwater, and may limit activities or land use as well as defining requirements for future site-redevelopment activities.

3.2 Evaluation of Cleanup Alternatives

Cleanup alternatives presented in the FS include the following:

- Alternative 1 was no action that does not pass the threshold requirements, and is not discussed further.
- Alternative 2 includes soil excavation of the Source Area to a fifteen foot depth but no groundwater treatment.
- Alternative 3 includes soil excavation of the Source Area to 6 foot depth and focused groundwater remediation out to MW-03.
- Alternative 4 includes soil excavation of the Source Area to fifteen foot depth and focused groundwater remediation out to MW-03.
- Alternative 5 includes soil excavation of the Source Area to 6 foot depth and focused, expanded groundwater remediation encompassing MW-03 and MW-05.
- Alternative 6 includes soil excavation of the Source Area to fifteen foot depth and focused, expanded groundwater remediation encompassing MW-03 and MW-05.
- Alternative 7 includes soil excavation of the Source Area to fifteen foot depth and focused, expanded groundwater treatment encompassing MW-03 and MW-05. It also includes reactive zone injections along public access ways reaching down plume out to Division Street.

Cleanup actions are subject to the threshold requirements set forth in WAC 173-340-360(2)(a). Under the threshold requirements, the cleanup action shall:

- Protect human health and the environment.
- Comply with cleanup standards.
- Comply with applicable state and federal laws.

- Provide for compliance monitoring.

Alternatives 2 through 7 employ Institutional Controls, compliance groundwater monitoring, and monitored natural attenuation.

The selected CULs and REL are consistent with MTCA. Additionally, local, state, and federal laws related to environmental protection, health and safety, transportation, and disposal would apply to the proposed alternatives. Applicable or relevant and appropriate requirements (ARARs) will be refined during the design process. The following are the current significant ARARs:

- Resource Conservation and Recovery Act (RCRA): Disposal of any material off site would be subject to RCRA to ensure appropriate disposal of waste, including hazardous and nonhazardous material. All alternatives include soil excavation and off-site disposal; the material will be profiled and disposed of at an approved and regulated facility.
- Washington State Hazardous Waste Management Regulations: As with the federal RCRA regulations, the material disposed of may be subject to dangerous waste management regulations (Revised Code of Washington [RCW] 70A.300, WAC 173-303). Unless exempt from these regulations, all waste will be handled according to these regulations.
- The Washington State Environmental Policy Act (SEPA): The SEPA process is undertaken when a state governmental entity makes a decision. A SEPA checklist is completed by the lead governmental agency to make a determination of impact.
- Underground Injection Control (UIC) Regulations: UIC regulations require permitting of a project before material can be injected into the subsurface.
- RCW 18.104 and WAC 173-160: Regulates water well construction minimum standards.
- Water Pollution Control RCW 90.48: Regulates storm water discharge from construction sites.

During remedial design, the selected alternative will be designed to comply with ARARs.

3.2.1 Evaluation Factors

MTCA states that in the selection of a cleanup alternative, preference shall be given to “permanent solutions to the maximum extent practicable.” “Permanent” is defined in WAC 173-340-200 as a cleanup action in which the cleanup standards of WAC 173-340-700 through 760 are met without further action being required at the Site being cleaned up or at any other Site involved with the cleanup action, other than the approved disposal of any residue from the treatment of hazardous substances.

To determine the “maximum extent practicable” for each alternative, a disproportionate-cost analysis (DCA) outlined in WAC 173-340-360(3)(e) is used. Costs are determined to be disproportionate to benefits if the incremental cost of a more expensive alternative over that of a lower-cost alternative exceeds the incremental degree of benefits achieved by the more expensive alternative. Consistent with WAC 173-340-360(3)(f), the evaluation criteria used were a mix of qualitative and quantitative factors, including protectiveness, permanence, effectiveness over the long term, management of short-term risks, technical and administrative implementability, and consideration of public concerns.

The cleanup alternatives are evaluated by the criteria below.

3.2.2 Protectiveness

Protectiveness is a factor by which human health and the environment are protected by the cleanup action, including the degree to which existing risks are reduced; the time required to reduce risk at the facility and attain cleanup standards; on-Site and off-Site risks resulting from implementing the cleanup action alternative; and improvement of the overall environmental quality.

Generally, all of the alternatives are protective because there is no complete exposure pathway at the Site, with the exception at the Source Area and where impacted groundwater might enter surface water. All of the alternatives will reduce contamination.

Alternative 2 has a lower ranking for protectiveness: human and ecological exposure to soils exceeding CULs and REL is minimized by removal of the soil from the Site; however, treatment of groundwater would not be addressed in this alternative. Alternatives 3, 4, 5, 6, and 7 also address soil-exceeding CULs and REL by removal from the Site; but, compared to Alternative 2, they hasten the groundwater remediation and are expected to treat soil impacts not removed via excavation (i.e., B8) through *in situ* injections.

3.2.3 Permanence

Permanence is a factor by which the cleanup action alternative permanently reduces the toxicity, mobility, or volume of hazardous substances. It takes into account the adequacy of the alternative in destroying the hazardous substances, the reduction or elimination of hazardous substance releases and sources of releases, the degree of irreversibility of the waste-treatment process, and the characteristics and quantity of treatment residuals generated. Removal of soil would be considered the most permanent soil action because it would permanently eliminate the source of releases at the Property.

Excavation will be used to remove soil contamination. However, it is not feasible to permanently remove all groundwater contamination because low conductivity of the upper terrace deposits and the large contaminant plume. Therefore, the permanence of all alternatives depends on the extent of groundwater treatment and natural attenuation of the contaminants. Alternatives 3, 4, 5, 6, and 7 use additional groundwater treatment and decrease contaminant levels sooner than alternatives without additional groundwater treatment. The alternatives are ranked based on the extent of soil removal and groundwater remediation in order of least to most permanent: Alternative 2, Alternative 3, Alternatives 4 and 5, Alternatives 6 and 7.

3.2.4 Effectiveness over the long term

Long-term effectiveness includes the degree of certainty that the alternative will be successful over the long term; the reliability of the alternative for the expected duration of hazardous substances remaining on site at concentrations that exceed CULs; the magnitude of residual risk with the alternative in place; and the effectiveness of controls required to manage treatment residues or remaining wastes.

Alternative 7 is considered most effective over the long term in addressing groundwater contamination, with Alternative 6 closely ranked behind. Alternatives 4 and 5 are ranked slightly lower than Alternative 6. Alternative 3 addresses the highest areas of the groundwater contamination via bioremediation but not the entirety, resulting in a slightly less effective alternative than Alternatives 4 and 5. Alternative 2 is ranked lower, as no active groundwater remediation is incorporated.

3.2.5 Management of short-term risks

Short-term risks to remediation workers, the public, and the environment are assessed under this criterion. Generally, short-term risks are expected to be linearly related to the amount of material handled, treated, and/or transported and disposed of (e.g., worker injury per cubic yard excavated [equipment failure], public exposure per cubic yard-mile transported [highway accident]).

This factor addresses the risk to human health and the environment associated with the alternative during construction and implementation, and the effectiveness of measures that will be taken to manage such risks. Potential public exposure during transport, handling, and excavation required for the alternatives could lead to short-term risks.

Alternative 3 best facilitates the management of short-term risks, as it includes only shallow soil removal and handling and Source Area injections. Alternatives 2, 4, 6, and 7 include the deeper soil removal and handling, but the deeper extent includes saturated soil with increased shoring and dewatering. Alternatives 5, 6 and 7 also involve drilling in the right-of-way. Alternative 3 is ranked highest, as the active remediation is concentrated in the Source Area and the risks can be controlled accordingly. Alternative 7 is ranked lowest, based on both the deeper soil excavation and extensive injections along public rights-of-way, resulting in slightly higher potential risk to remediation workers and the public.

3.2.6 Technical and administrative implementability

This factor addresses whether the alternative can be implemented and is technically possible. The availability of necessary materials, regulatory requirements, scheduling, access for construction operations and monitoring, and integration with existing and neighboring site uses must be considered.

The deeper soil removal for Alternatives 2, 4, 6 and 7 reduces the implementability.

Alternatives 5, 6, and 7 include the implementation issues associated with increased areas of injection.

3.2.7 Consideration of public concerns

This factor considers concerns from individuals, community groups, local governments, tribes, federal and state agencies, and any other organization that may have an interest in or knowledge of the Site and that may have a preferred alternative. Through the public process, the public will have an opportunity to review and comment on plans.

3.2.8 Disproportionate-Cost Analysis

In accordance with WAC 173-340-360(3)(e), the most practicable permanent solution evaluated will be the baseline cleanup action alternative to which the other cleanup action alternatives are compared. Based on this, Alternative 7 is the baseline alternative for this analysis. Each alternative was given a ranking between one and five (five being optimal, one being inadequate). Where there were only slight differences, fractional rankings were applied. Based on these criteria, Alternative 2 is ranked 2.7; Alternative 3 is ranked 3.5; Alternative 4 is ranked 3.6; Alternative 5 is ranked 3.3; Alternatives 6 and 7 are ranked 3.2 (see initial DCA rankings on Table 3-1).

4.0 DESCRIPTION OF CLEANUP ACTION SELECTED

Results of the disproportionate-cost analysis used in selecting the cleanup action, as provided in the RI/FS (MFA, 2019), indicated Alternative 3 has the highest ranking. Alternative 3 consists of Source Area soil excavation up to six feet bgs, Source Area focused groundwater remediation, institutional controls, and compliance groundwater monitoring.

Ecology has the discretion to favor or disfavor qualitative benefits of the various cleanup alternatives considered and can use that information in selecting a cleanup action. Ecology has reassessed benefits of each cleanup alternative and adjusted the DCA rankings accordingly (see initial and adjusted DCA on Table 3-1). This has resulted in Alternative 4 having the highest cleanup option ranking. Ecology is selecting Alternative 4 as the preferred cleanup option as explained below.

Included here is a description of cleanup Alternatives 3 and 4 and the differences between them.

Soil excavation

The soil excavation is centered primarily on the Property and extends to the adjoining Hinrich parcels and shallow soil on property owned by the City. Source Area excavation in Alternative 3 would be 3 to 6 feet bgs covering approximately 700 square foot area (approximately 250 cubic yards total). This would leave soil contamination above REL in the subsurface from 6 to 15 feet bgs. Soil excavation in Alternative 4 would cover an approximately 1,700 square foot area with excavation to 15 feet bgs and a 300 square feet area to 3 feet bgs (approximately 1,000 cubic yards total) (see Figure 4-1). Excavation would be to the top of the underlying clay unit. Contamination does not appear to enter into the clay unit. Alternative 4 would remove soil above REL and contamination that is a potential contaminant source to groundwater and decrease the potential for direct exposure contact during any building construction and subsurface excavation activity.

At least ten confirmation soil samples would be collected from the excavation limits and be submitted for VOC analysis following Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) requirements.

Alternative 4 would differ from Alternative 3 because dewatering would be needed to allow Source Area excavation below the water table (ranging seasonally between 2 to 7 feet bgs). That water would be contained and characterized for appropriate treatment and disposal. Decommissioning of monitoring wells MW01 and MW21 would be needed as they are located in the area of the deeper excavation. Another advantage of Alternative 4 is the dewatering would remove impacted groundwater from the Source Area reducing subsurface contaminant contribution from groundwater.

For either alternative, excavated soil will be assessed for hazardous content and disposed at a Subtitle C, or other appropriate, landfill. Cost-effective and environmentally protective methods of disposal, including a Contained-In Determination issued by Ecology, will be explored during remedial design. The excavation will be backfilled with clean, imported fill to existing ground surface and compacted to a minimum of 92 percent based on the Modified Proctor Test (ASTM 2012). Surface restoration will be completed with gravel or asphalt pavement to match previous conditions.

Groundwater treatment

In situ groundwater treatment would be the same for either Alternative. Treatment area on the Property and the Source Area would be outside the excavated area to MW03, using injection points to treat PCE in groundwater. For the purpose of the cost estimate, 9,700 square feet will be treated from an average depth of 5 to 15 feet bgs with a reducing agent and enhanced bioremediation solutions (i.e., 43,450 pounds of anaerobic EHC™ bioremediation amendment followed by 30 liters of microorganism DHC inoculation to enhance degradation) (see Figure 4-1). The cost estimate was conservatively based on treating PCE concentrations of approximately 300,000 micrograms per kilogram (µg/kg) in soil and 20,000 micrograms per liter (µg/L) in groundwater for the Property and 100,000 µg/kg in soil and 7,000 µg/L in groundwater in the Source Area (nearing MW03).

4.1 Evaluation Factors

The following criteria were used to evaluate and compare Alternatives 3 and 4 following the disproportionate-cost analysis format to determine whether a cleanup action is permanent to the maximum extent practicable.

Protectiveness

In the FS, Alternative 3 and 4 have the same ranking for protectiveness. Alternative 3 only removes contaminated soil to six feet in depth whereas Alternative 4 soil removal is to 15 feet bgs. Alternative 4 removes contaminated groundwater from the subsurface during dewatering that is not done in Alternative 3. One of the arguments in the FS on Alternative 3 protectiveness is *in situ* groundwater treatment would likely result in ancillary treatment of soil contamination beneath the water table, reducing the benefit to excavate deeper soil. However, contamination removal is more effective than treatment by substrate injection because the substrate may not reach all contamination. Ecology finds that Alternative 4 removes more contamination from the ground sooner than Alternative 3 and is therefore more protective and ranked higher than Alternative 3.

Permanence

Ecology agrees with the FS where Alternative 4 is ranked higher than Alternative 3 for this criterion because of the greater extent of soil and groundwater removal and groundwater treatment to be more effective with less residual contamination to treat and because there is less source contribution to groundwater to feed the distal plume.

Effectiveness over the long term

Ecology agrees with the FS where Alternative 4 is ranked higher than Alternative 3 for the same reasons provided under the permanence criterion. Also, with more initial removal of contamination, the cleanup timeframe is reduced.

Management of short-term risks

Ecology agrees with the FS where Alternative 3 is ranked higher than Alternative 4 because more impacted media is being handled and transported. Ecology's change to the rankings for Alternatives 3 and 4 better aligns them with the other alternative rankings and relative risks.

Technical and administrative implementability

Ecology agrees with the FS where Alternative 3 is ranked higher than Alternative 4 because there is more work required for deeper soil removal and dewatering so implementability is more involved. Ecology's change to the rankings for Alternatives 3 and 4 better aligns them with the other alternative rankings and relative risks.

Consideration of public concerns

There is no evaluation factor ranking of this alternative in the FS. The amount of public notification required for Alternative 3 or 4 would be the same.

Disproportionate-Cost Analysis

The highest ranked alternative is deemed the more worthy cleanup option over lower ranked alternatives. Ecology's adjusted rankings of the various cleanup alternatives and the average ranking for Alternatives 4 is the highest ranked alternative. See the revised DCA rankings in Table 3-1. Ecology prefers Alternative 4 because it has the highest ranking and is more protective and permanent cleanup option and would likely have a shorter restoration timeframe.

4.2 Groundwater 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 that 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. A long-term performance groundwater-monitoring plan is required for this site to track contamination levels and confirm effectiveness of the cleanup action.

4.2.1 New Well Installation

The vertical extent of contamination in the LWBZ has not been adequately evaluated. Ecology is requiring the drilling of at least three soil borings and installation of groundwater monitoring wells into the sandy gravel portion of the LWBZ beneath the Site to sample and analyze groundwater from these wells for VOCs. A monitoring well installation plan for the LWBZ is a required part of the Engineering Design Report (EDR) deliverable for this CAP.

The borings will be advanced using telescoping casing methodology to prevent drag down of contamination from the UWBZ into the LWBZ. The exact locations and monitoring well design will be worked out with Ecology during the remedial design but well configuration will allow determination of groundwater flow direction in the LWBZ. The wellhead elevations will be surveyed to tie in with existing Site monitoring well network.

4.2.2 Groundwater Sampling Plan

A groundwater-monitoring plan is a required part of the Engineering Design Report. Park Laundry Site (see Figure 1-2) monitoring wells are located in a residential upland area of Ridgefield between North 3rd and Railroad Avenues and Division and Pioneer Streets. The monitoring plan will include the sampling schedule for the new LWBZ wells. In addition, three other wells where contamination from the Park Site have been detected, MW-29D, MW-47D, and MW-46D, are located on Port property to the west of the residential area. Ecology requires these three wells be added to the Park Site groundwater-monitoring plan. This will require access be worked out with the Port for sampling and reporting the results. Conducting a baseline-sampling event is required before any remedial activity is attempted. Use the data from the baseline event as the starting concentration to compare all subsequent analytical results and track cleanup progress.

The number of wells proposed in the FS sampling was 11. The CAP requires sampling of 19 wells including the addition of the three wells located on the Port property and the new LWBZ wells. Upland and Port wells are screened in the UWBZ. Compliance sampling event wells include MW02, MW03, MW04, MW05, MW06, MW07, MW09, MW10, MW11, MW13, MW15, MW16, MW20, MW-29D, MW-46D, and MW-47D. Analytical results from monitoring wells MW08, MW14, MW17, MW18, and MW19 contaminant levels are below CULs for four consecutive monitoring events and are omitted from further sampling. Performance monitoring to check plume status would be at wells MW03, MW04, MW05, and MW13. Sample analysis will be for PCE and its possible degradation products (e.g., TCE, 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, and VC; see analytes on Table 2-1).

4.2.3 Restoration Progress

Contingency actions will be implemented if performance monitoring data indicates that the cleanup is not on track to achieve the objectives of the cleanup action within the estimated restoration timeframe. Data trends will be reported annually including trend analysis and extrapolation of concentrations over time from wells downgradient from the Source Area to wells at the Lake River shore. Should contaminant levels in groundwater stagnate or increase another Source Area groundwater *in situ* treatment sequence will be required.

4.3 Institutional Controls

It is possible that PCE and its breakdown products will remain in Source Area soil and/or groundwater above CULs set forth in this document after completion of the cleanup actions. If that is the case, an Environmental Covenant (EC) will be required for those properties. The purpose of ICs is to assure both the continued protection of human health and the environment by restricting access to remaining contaminated media while VOCs degrade in response to cleanup actions and monitored natural attenuation.

The EC will prohibit groundwater use at the Source Area for irrigation, potable drinking water, or any use involving human contact. A vapor barrier or control system (or other Ecology-approved approach) will be required for any building constructed over areas where VOCs are present in the subsurface exceeding MTCA vapor intrusion screening levels on the Property and Source Area. Groundwater use prohibition will remain in-place until soil and groundwater CULs have been met. The potentially liable persons (PLP) will incorporate these restrictions into a draft EC for Ecology’s review and approval. Assessment may be undertaken periodically to determine whether continuation of ICs is required.

4.4 Point of Compliance

For soil CULs protective of groundwater that is protective of surface water the POC shall be established in the soils throughout the Site.

The POC for groundwater is throughout the site from the uppermost level of the saturated zone extending vertically to the lowest most depth which is known to be affected by the Site (WAC 173-340-720[8] [b]). Groundwater sampling results from the new LWBZ monitoring wells will indicate if that unit is included in the Site POC.

The POC for surface water is the point or points at which hazardous substances are released to the surface water body. For this Site, where hazardous substances are potentially released to surface water as a result of groundwater flow, no mixing zone is allowed to demonstrate compliance with surface water CULs.

4.5 Restoration Timeframe

The cleanup action has a reasonable restoration timeframe based on the following factors:

- The restoration timeframe varies across the Site but is estimated at approximately 20 years as calculated from PCE degradation rates in groundwater samples from Site monitoring wells dating back to 2011.
- The potential risks to human health and the environment posed by the Site are direct contact with impacted soil or groundwater and inhalation of vapors from the groundwater in close proximity to the Source Area. These potential exposures will be addressed by excavating soil to 15 feet bgs, Source Area dewatering, and *in situ* groundwater remediation.
- The selected alternative will achieve a more reasonable restoration timeframe because it will employ active source cleanup versus leaving all or some Source Area contamination in place and undisturbed.
- The present use of the Property/Source Area parcels are gravel covered parking lots. The proposed use will be for retail or commercial development and will not be affected by contamination from the Site following cleanup actions and use of ICs.
- The FS determined the costs, practicality, and implementability for a cleanup method with a shorter restoration timeframe are disproportionate to the benefits achieved by a cleanup alternative of lower costs. This in particular applies for active cleanup along the entire plume length.
- ICs to be put in place at the Source Area are effective and reliable. See section 4.4 for specifics.
- The plume extent is defined and is not spreading. Sampling data indicates groundwater contaminant levels are decreasing naturally.
- Long-term groundwater monitoring will be conducted to assess the stability, decrease, or increase of concentrations in groundwater and presence of natural attenuation.
- A municipal drinking water source is available and there is no need for development of domestic water supply.
- The implementation, for both excavation and dewatering and injections, is estimated to take a few months.

4.6 Schedule for Cleanup Action Implementation

A schedule of actions and deliverables can be seen on the Consent Decree Exhibit C. Cleanup implementation will begin as described in the final EDR. The EDR will include groundwater monitoring and LWBZ well installation plans.

4.7 Public Participation

Public notice and opportunity for comment on the draft CAP will be provided as required in WAC 173-340-600(14). After review and consideration of the comments received during the public comment period, a final CAP will be issued, with its availability published in the Site Register and the local newspaper(s).

REFERENCES

Clark County GIS. 2016. Maps online, property and lands information records. http://gis.clark.wa.gov/mapsonline/ (accessed January 15, 2016).

Ecology. 2013. Consent Decree. Pacific Wood Treating Company Site (or Lake River Industrial Site). July 25.

Ecology. 2019. Electronic mail (re: Park Laundry, Ridgefield—documenting discussion at May 9, 2019, meeting between C. Rankine [Ecology] and J. Maul and M. D'Andrea [MFA]) to J. Maul and M. D'Andrea, Maul Foster & Alongi, Inc., from C. Rankine, Washington State Department of Ecology. June 11.

MFA. 2010a. Remedial Investigation Work Plan, former Park Laundry. Prepared for Union Ridge Investment Company. Maul Foster & Alongi, Inc. January 21.

MFA. 2010b. Letter (Re: Draft Supplemental Soil Gas Sampling Work Plan for Former Park Laundry Site, 122 North Main Avenue, Ridgefield, Washington) to G. Barrett, Washington State Department of Ecology, from M. Gibson and J. Maul, Maul Foster & Alongi, Inc. February 25.

MFA. 2010c. Memorandum (Re: Data Submittal for March 2010 Site Investigation at the Union Ridge Investment Company Property in Ridgefield, Washington) to G. Barrett, Washington State Department of Ecology, from M. Gibson, Maul Foster & Alongi, Inc. June 29.

MFA. 2011a. Letter (Re: Remedial Investigation Work Plan Addendum for Former Park Laundry Site, 122 North Main Avenue, Ridgefield, Washington) to G. Barrett, Washington State Department of Ecology, from M. D'Andrea, Maul Foster & Alongi, Inc. April 5.

MFA. 2011b. Letter (Re: Data Submittal for Former Park Laundry Property, Ridgefield, Washington) to G. Barrett, Washington State Department of Ecology, from M. D'Andrea, Maul Foster & Alongi, Inc. August 29.

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MFA. 2014. Letter (Re: Former Park Laundry [Cleanup Site ID 4099] Remedial Investigation Work Plan Addendum) to C. Rankine, Washington State Department of Ecology, from M. D'Andrea and J. Maul, Maul Foster & Alongi, Inc. July 31.

MFA. 2019. Remedial Investigation and Feasibility Study Report, former Park Laundry, Washington State Department of Ecology Agreed Order No. DE 6829. Maul Foster & Alongi, Inc., Vancouver, Washington. July 11.

TABLES

Table 2-1
Park Laundry Cleanup Levels
Former Park Laundry
The City of Ridgefield
Ridgefield, Washington

CAS Number	Analyte	Groundwater CUL Potable Ingestion (ug/L)		Fresh Surface Water CUL (ug/L)		Minimum Groundwater CUL (ug/L)		Soil CUL Direct Contact (mg/kg)		Soil CUL Protection of Groundwater (unsaturated) (mg/kg)		Soil CUL Protection of Groundwater (saturated) (mg/kg)		[redacted]	Final Groundwater CUL (ug/L)		Final Soil CUL Protective of GW (mg/kg)	
127-18-4	PCE	5	A	2.4	C	2.4	C	480	A	0.024	G	0.0013	G	[redacted]	2.4	C	0.024/0.005	I
79-01-6	TCE	4	B	0.3	C	0.3	C	12	A	0.0019	G	0.00011	G	[redacted]	0.3	C	0.005	J
75-35-4	1,1-DCE	7	A	300	E	7	B	4000	A	0.046	H	0.0025	H	[redacted]	7	A	0.046/0.005	K
156-59-2	cis-1,2-DCE	16	B	3300	F	16	B	160	A	0.079	H	0.0052	H	[redacted]	16	B	0.079/0.0052	L
156-60-5	trans-1,2-DCE	100	A	100	E	100	A, F	1600	A	0.52	H	0.032	H	[redacted]	100	A, E	0.52/0.032	M
75-01-4	VC	0.29	B	0.02	D	0.02	D	0.67	A	0.00012	G	0.0000062	G	[redacted]	0.02	D	0.005	J

Notes:

CAS = Chemical Abstract Services chemical registry number
CUL = cleanup level
GW = groundwater
mg/kg = milligram per kilogram
ug/L = microgram per liter
Eq. = equation
BCF = biocentration factor

PCE = tetrachloroethene
TCE = trichloroethene
1,1-DCE = 1,1-dichloroethene
cis-1,2-DCE = cis-1,2-dichloroethene
trans-1,2-DCE = trans-1,2-dichloroethene
VC = vinyl chloride

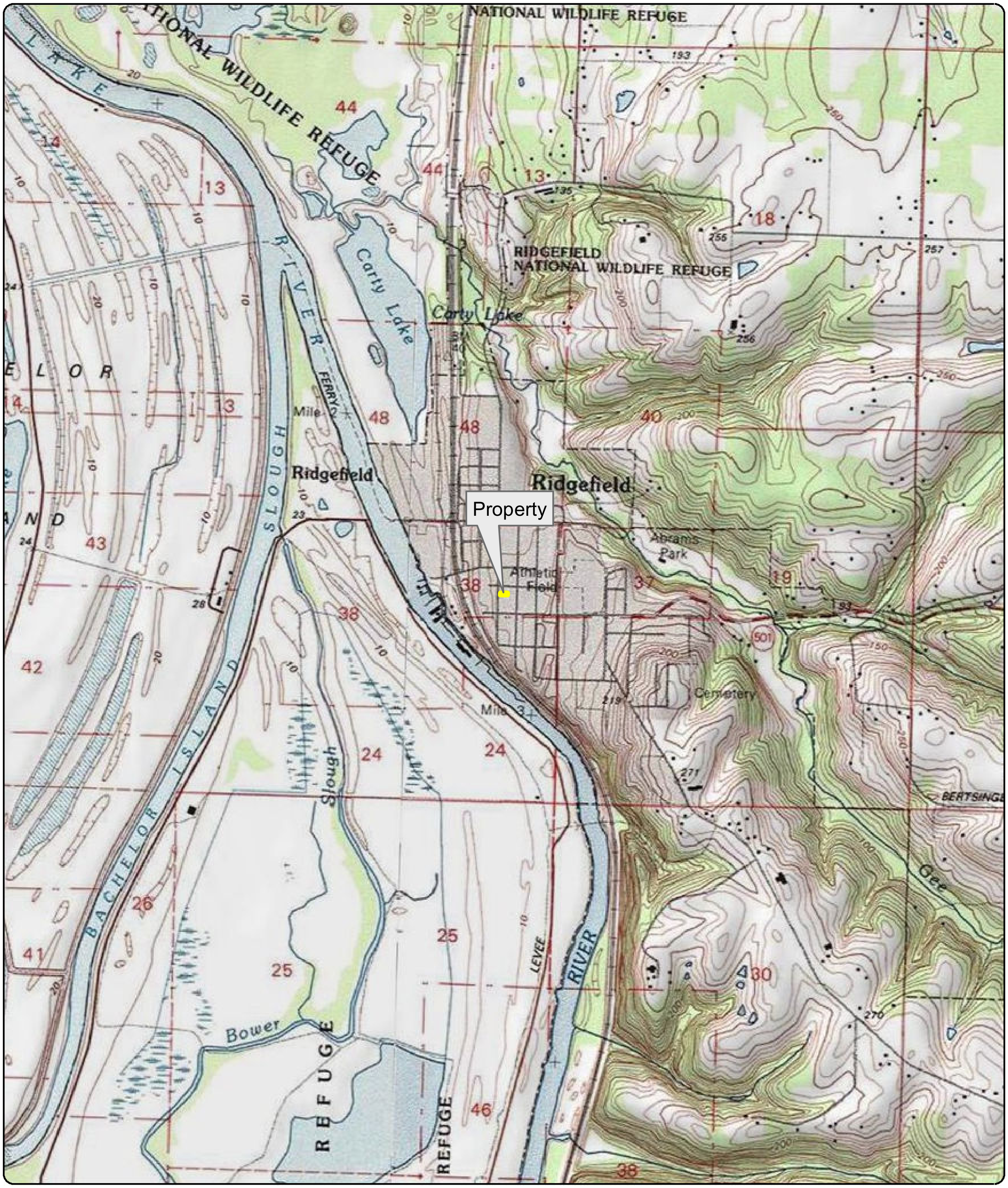
A = MTCA Method B soil or groundwater cleanup level is based on the state/federal Maximum Contaminant Levels (MCLs).
B = Adjusted Environmental Protection Agency (EPA)/State MCL to a 1E-05 risk level or a hazard quotient of 1.
C = Human Health Fresh Water Title 40 Code of Federal Regulations (CFR) 131.45
D = Human Health Fresh Water 173-201A Washington Administrative Code (WAC).
E = Human Health Fresh Water Clean Water Act 304.
F = MTCA Method B Surface Water Human Health level based on noncancer effects (MTCA Eq. 730-1). The BCF for trans-1,2-DCE was used for cis-1,2-DCE as these are similar chemicals.
G = MTCA Method B Eq. 747-1 selected soil CUL for unsaturated or saturated conditions is based on protection of groundwater to surface water.
H = MTCA Method B Eq. 747-1 selected soil CUL for unsaturated or saturated conditions is based on protection of potable groundwater and groundwater to surface water.
I = Selected soil CUL for unsaturated (0.024) or saturated conditions (0.005 - adjusted to Practical Quantitation Level [PQL]) is based on protection of groundwater to surface water.
J = Selected soil CUL for unsaturated or saturated (both adjusted to PQL of 0.005) conditions is based on protection of groundwater to surface water.
K = Selected soil CUL for unsaturated (0.046) or saturated (0.005 - adjusted to PQL) conditions is based on protection of potable water.
L = Selected soil CUL for unsaturated (0.079) or saturated (0.0052) conditions is based on protection of potable water.
M = Selected soil CUL for unsaturated (0.52) or saturated (0.032) conditions is based on protection of potable water and groundwater to surface water.

Table 3-1
Disproportionate-Cost Analysis
Former Park Laundry
The City of Ridgefield
Ridgefield, Washington

Alternative	Description	Protectiveness	Permanence	Long-Term Effectiveness	Management of Short-Term Risks	Implementability	**Average**	Public Concerns	Remedial Action Total	Monitoring & Maintenance (NPV)	**Total Cost**
Alternative 1	No Action	--									
Alternative 2	Soil Removal to 15'	2/2	2/2	2/2	3/3.2	4/4.5	**2.6/2.7**	NR	$771,000	$319,000	**$1,089,000**
Alternative 3	Soil Removal to 6', Focused Groundwater Remediation	4/3.4	3/3	3/3	5/3.5	5/4.4	**4/3.5**	NR	$623,000	$319,000	**$942,000**
Alternative 4	Soil Removal to 15', Focused Groundwater Remediation	4/3.6	3.5/3.5	3.5/3.5	2.5/3.0	4/4.3	**3.5/3.58**	NR	$1,199,000	$316,000	**$1,515,000**
Alternative 5	Soil Removal to 6', Expanded Groundwater Remediation	4/3.7	3.5/3.7	3.5/3.5	2.5/2.5	3/3	**3.3/3.28**	NR	$1,204,000	$319,000	**$1,523,000**
Alternative 6	Soil Removal to 15', Expanded Groundwater Remediation	4/3.9	4/4	4/4	2/2	2/2	**3.2/3.18**	NR	$1,781,000	$316,000	**$2,097,000**
Alternative 7	Soil Removal to 15', Complete Groundwater Remediation	4/4	5/5	5/5	1/1	1/1	**3.2/3.2**	NR	$3,615,000	$316,000	**$3,931,000**

NOTES:
Ranking values = 1: lowest; 5: highest
3.5/3.58 = Original Remedial Investigation/Feasibility Study ranking/Ecology revised ranking.
NR = No ranking

FIGURES



Property Address: Pioneer St & Main St, Ridgefield, Clark County, Washington
Source: US Geological Survey (1990) 7.5-minute topographic quadrangle: Ridgefield
DLC 38/Section 24, Township 4 North, Range 1 West

Figure 1-1
Property Location

Former Park Laundry
City of Ridgefield, Washington

0 1,000 2,000
Feet

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Print Date: 11/9/2015
Approved By: M. D'Andrea
Produced By: apadilla
Project: 8006.31.04

Figure 1-2
Park Laundry Site, Geologic Cross Section and Monitoring Well Locations

Former Park Laundry
City of Ridgefield, Washington

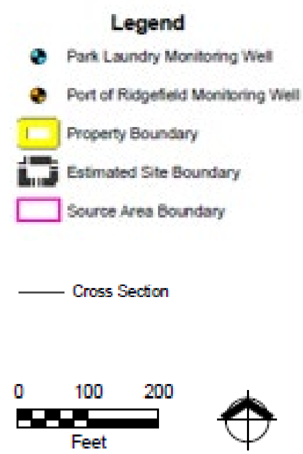
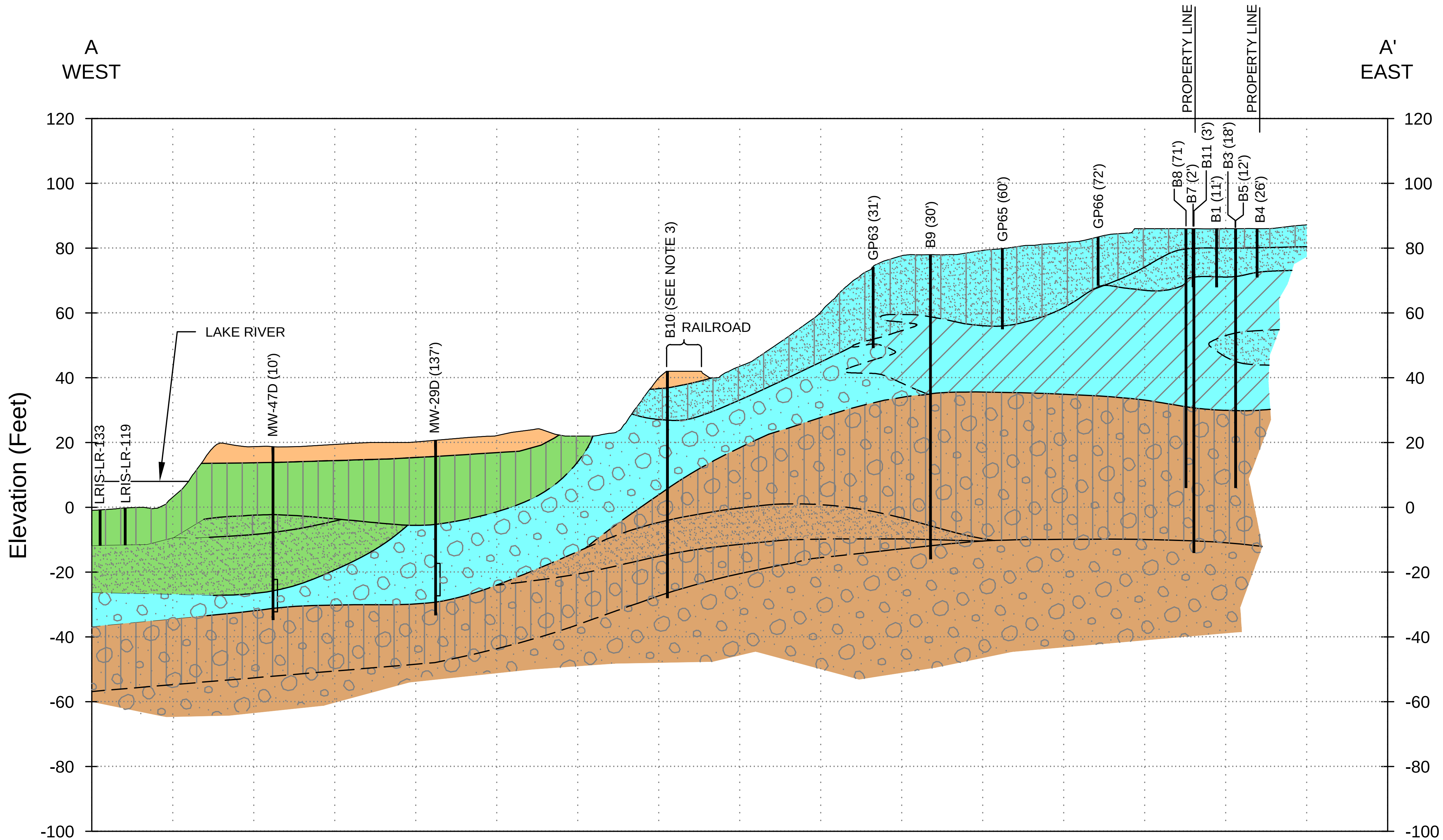


Figure 2-1
Generalized Geologic Cross Section

Former Park Laundry
City of Ridgefield, Washington



PROFILE VIEW OF SECTION
HORIZONTAL SCALE: 1" = 150' VERTICAL SCALE: 1" = 38'
VERTICAL EXAGGERATION: 4

LEGEND:

FILL

HOLOCENE (ALLUVIUM)
- SILT
- SAND
- SILTY SAND

PLEISTOCENE (ALLUVIUM)
- SAND (UPPER WBZ)
- SILTY SAND
- CLAY (AQUITARD)
- SANDY GRAVEL (UPPER WBZ)

TERTIARY (UPPER TROUTDALE)
- SILTY GRAVEL (AQUITARD)
- SANDY GRAVEL (LOWER WBZ)
- SAND

LITHOLOGIC CONTACT

INFERRED LITHOLOGIC CONTACT

NOTES:
1. Borings and Wells are projected perpendicular to the cross section line. Distances in feet are projected from the cross-section line and are shown in parentheses.
2. Actual location of B10 is just east of the railroad although it is shown to the west because of projection.
3. WBZ = Water Bearing Zone.

0 150 300
FEET

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Layout: Xsect Project: 8006.31.01 Drawn By: J. Fisher Approved By: A. Hughes

Path: X:\0239.33\05\ArcMap\Fig2-2_PCE Exceedances in Soil.mxd
Print Date: 4/19/2023
Reviewed By: mdandrea
Produced By: jroberts
Project: M0239.33.005

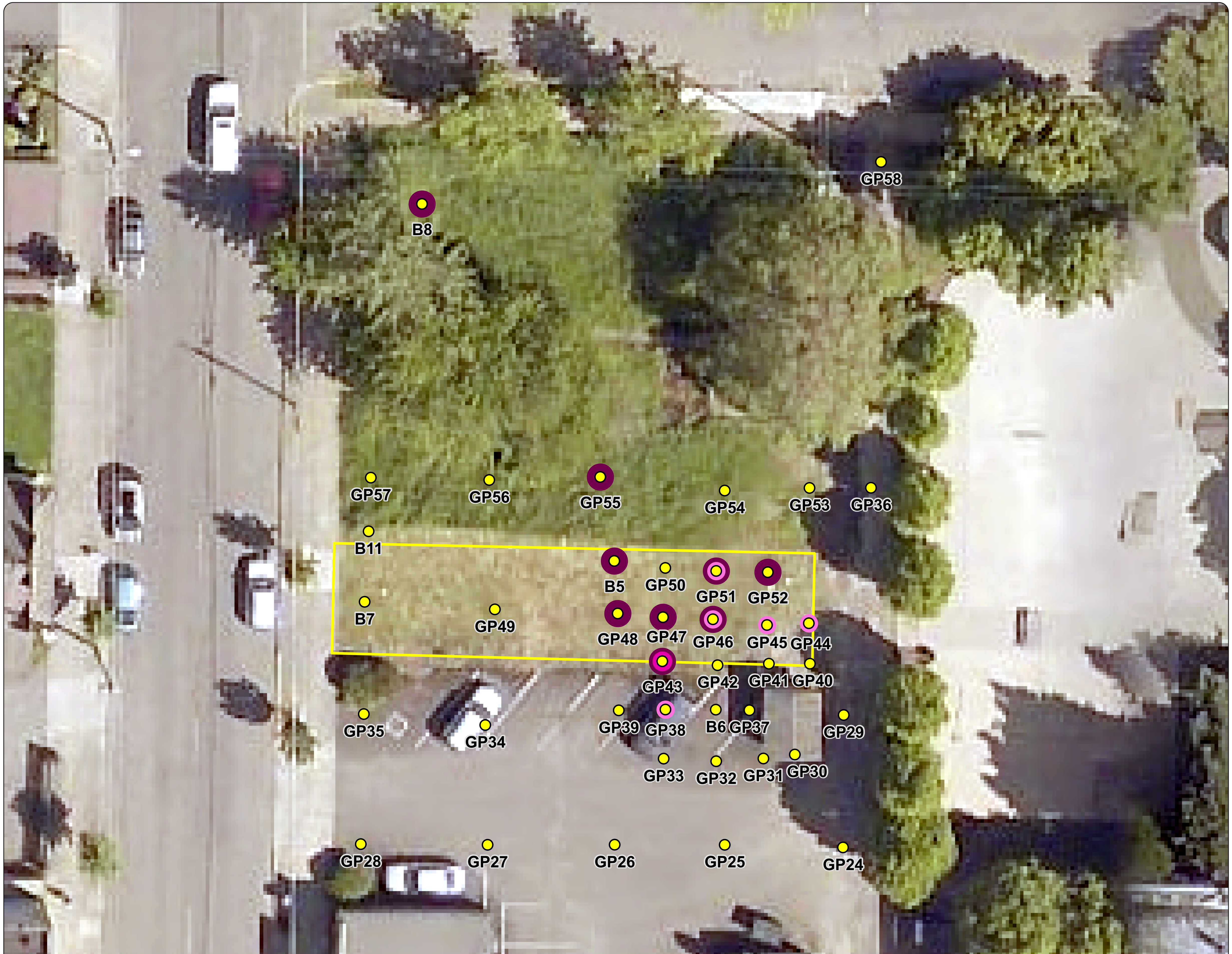

Figure 2-2
PCE Concentrations in Soil (0-15 ft bgs)

Former Park Laundry
Ridgefield, WA

Legend

- Boring Location
- Surface (0.5 ft bgs) Exceedance
- Mid-Depth (5 ft bgs) Exceedance
- Deep (> 12 ft bgs) Exceedance
- Property Boundary

Notes

An exceedance is defined as a concentration in excess of the selected REL for PCE in soil. REL for PCE = 0.05 mg/kg.
ft bgs = feet below ground surface.
mg/kg = milligrams per kilogram.
MTCA = Model Toxics Control Act.
PCE = tetrachloroethene.
REL = remediation level.

0 10 20
Feet

Data Source

Aerial photograph (2014) obtained from Clark County.

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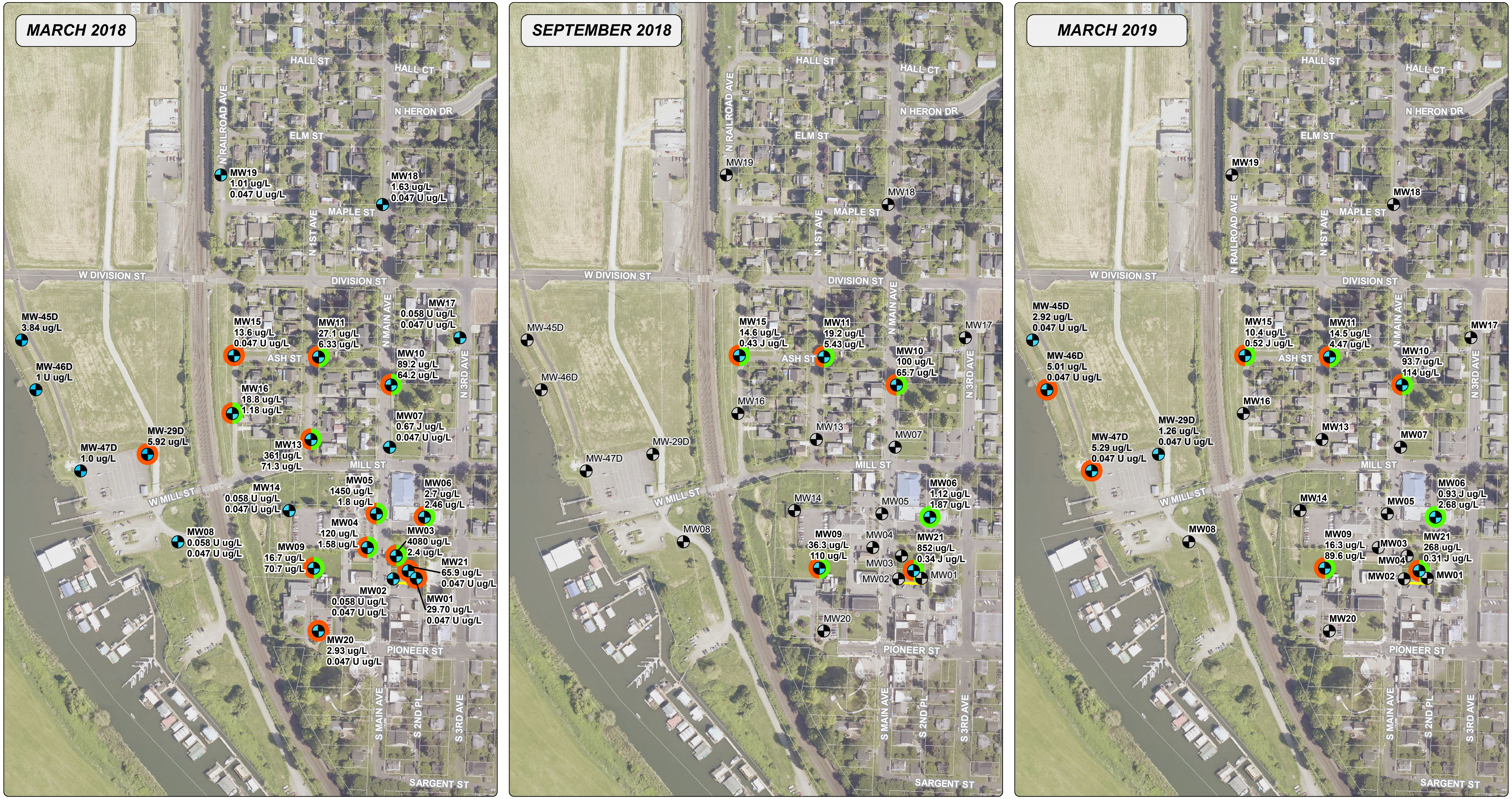

Data Source

Aerial photograph (2014) and taxlots (2016) obtained from Clark County.

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Notes

Park Laundry monitoring well locations were sampled March 19, 2018; September 12, 2018; and March 11, 2019.

When duplicate sampes are present, the highest value between the primary and duplicate sample is shown on the figure.

Port of Ridgefield wells on March 2018 figure were sampled in January 2018.

Port of Ridgefield wells on March 2019 figure were sampled in March 2019.

J = estimated concentration.

MTCA = Model Toxics Control Act.

NS = not sampled.

PCE = Tetrachloroethene.

TCE = Trichloroethene.

U = not detected at or above the reporting limit.

ug/L = micrograms per liter.

Legend

Scheduled Monitoring Well Sample Location (with monitoring results from March 2018, September 2018, and March 2019)

MW10	- Well ID
89.2 ug/L	- PCE concentration
64.2 ug/L	- TCE concentration

Monitoring Well Location Not Sampled

Fresh Surface Water CUL

PCE Exceedance (>2.4 μg/L)

TCE Exceedance (>0.3 μg/L)

PCE & TCE Exceedance (PCE >2.4 μg/L and TCE >0.3 μg/L)

Property Boundary

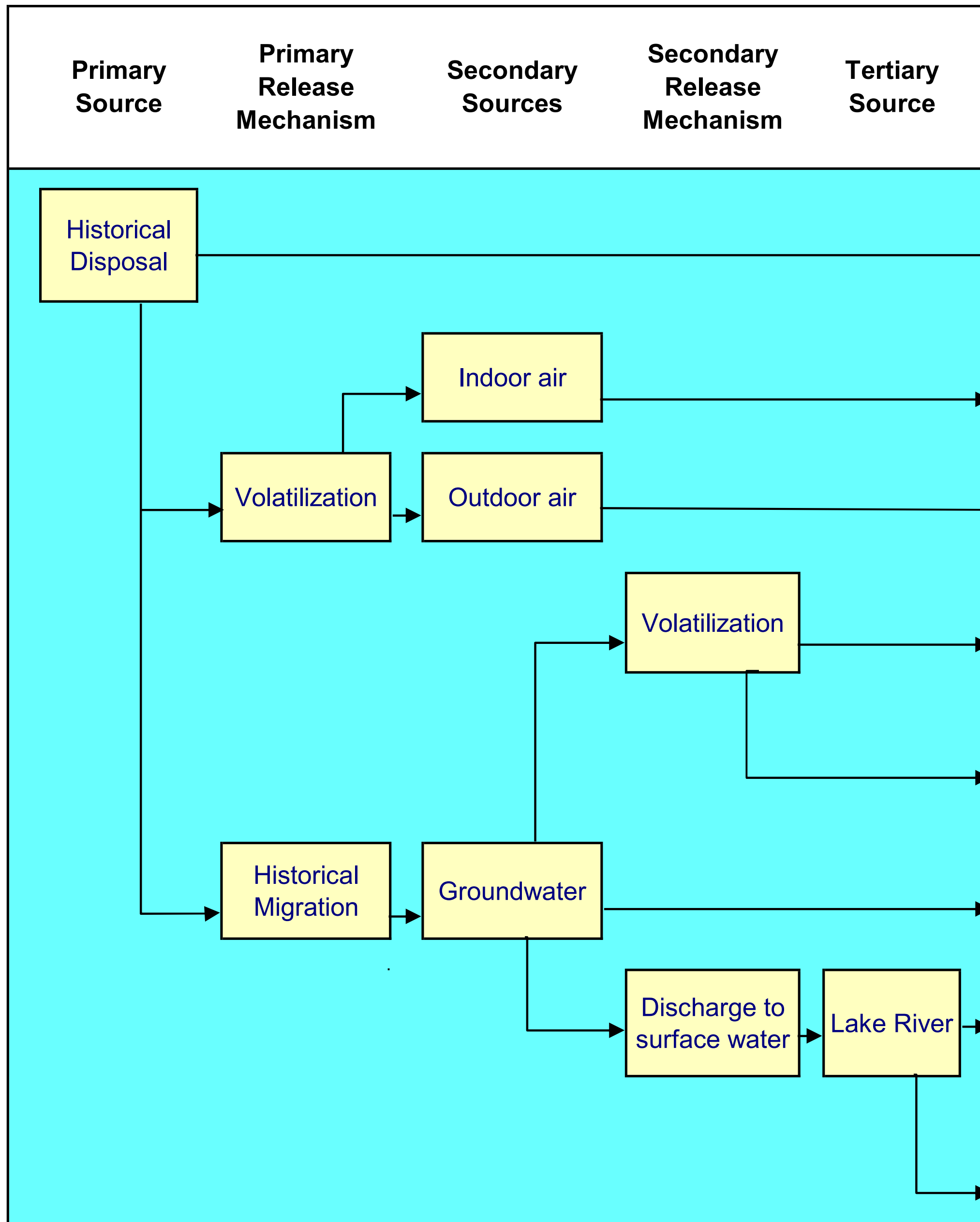
Parcel

Figure 2-3
Monitoring Results
March and September 2018 and March 2019
Former Park Laundry Site
Ridgefield, WA

0 125 250
Feet

Path: X:\0239.33\05\ArcMap\Fig2-3_PCE_TCE_Mar_Sept_2018_Mar_2019.mxd
Print Date: 4/19/2023
Reviewed By: mdandrea
Produced By: jroberts
Project: M0239.33.005

Figure 2-4
Conceptual Site Model of
Potential Human Exposure Pathways
Former Park Laundry
Union Ridge Investment Company
Ridgefield, Washington



Point of Potential Contact	Exposure Route	On-Property Receptors: Excavation Worker	On-Property Receptors: Commercial Worker	On-Property Receptors: Resident	Off-Property Receptors: Excavation Worker	Off-Property Receptors: Commercial Worker	Off-Property Receptors: Resident	Off-Property Receptors: Recreationist
Soil	Ingestion	✓	✓	✓	✓[a]	✓[a]	✓[a]	∅
Soil	Dermal Contact	✓	✓	✓	✓[a]	✓[a]	✓[a]	∅
Soil	Inhalation (dust)	✓	✓	✓	✓[a]	✓[a]	✓[a]	∅
Indoor air	Inhalation	I	✓	✓	I	I	I	∅
Outdoor air	Inhalation	I	I	I	I	I	I	I
Indoor air	Inhalation	I	✓	✓	I	I[b]	I[b]	∅
Outdoor air	Inhalation	I	I	I	I	I	I	I
Groundwater	Ingestion	✓	✓	✓	✓	✓	✓	∅
Groundwater	Dermal Contact	✓	✓	✓	✓	✓	✓	∅
Groundwater	Inhalation	✓	✓	✓	✓	✓	✓	∅
Surface Water and Sediment	Incidental Ingestion	∅	∅	∅	I	I	I	I
Surface Water and Sediment	Dermal Contact	∅	∅	∅	I	I	I	I
Fish Tissue (via bioaccumulation)	Ingestion	∅	∅	∅	∅	∅	∅	✓

Notes:

→ Primary Pathway
✓ Potentially Complete exposure route
∅ Incomplete exposure route
I Insignificant exposure route
[a]Hinrich Property and Police Station Property.
[b]Hinrich Property.

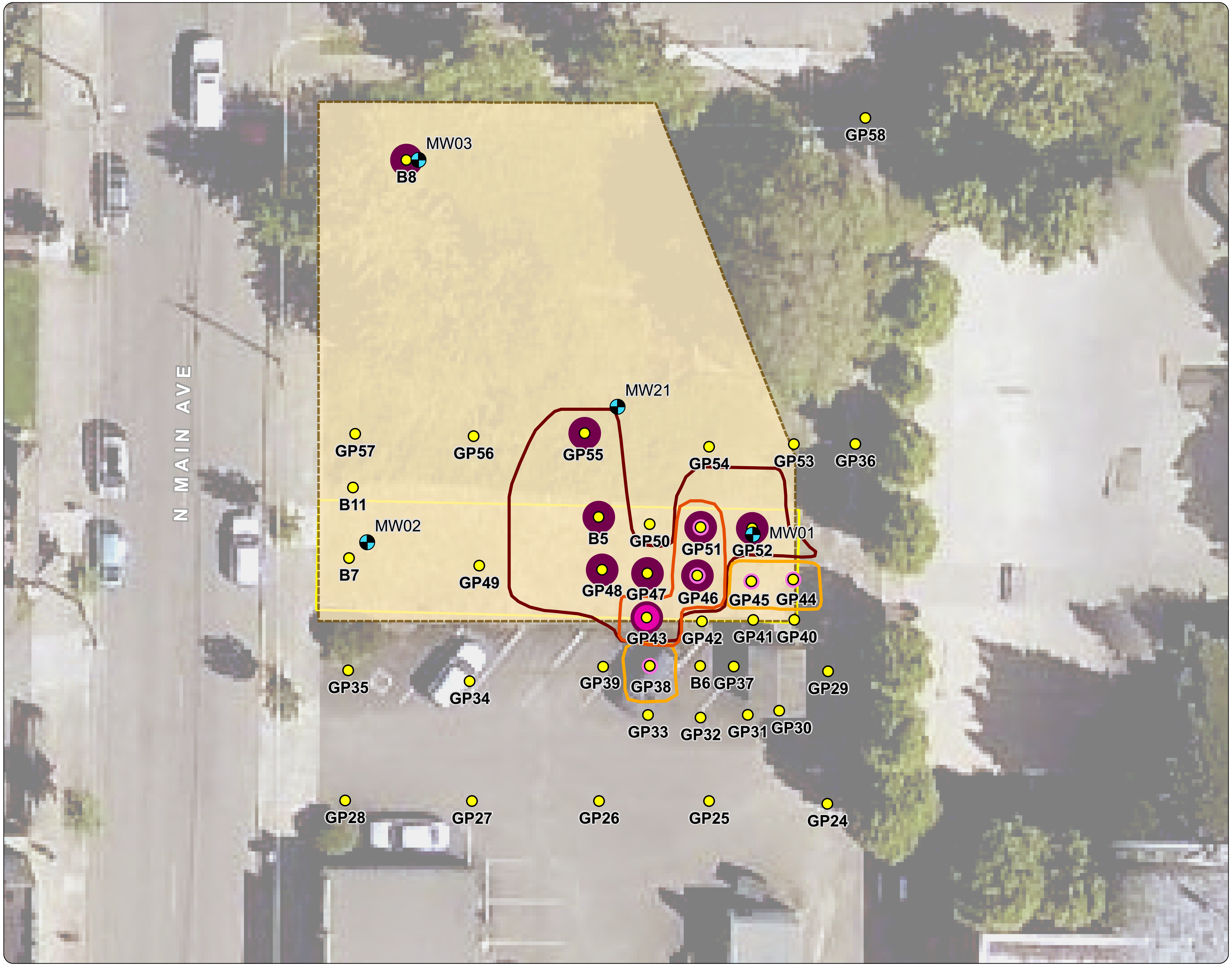


Figure 4-1
Cleanup Action

Former Park Laundry
Ridgefield, WA

Legend

- Monitoring Well
- Boring Location
- Surface (0.5 ft bgs) Exceedances
- Mid-Depth (5 ft bgs) Exceedances
- Deep (> 12 ft bgs) Exceedances
- 3' Proposed Excavation
- 6' Proposed Excavation
- 15' Proposed Excavation
- Focused Injections
- Property Boundary

Notes

Exceedance is defined as a PCE concentration in soil within the top 15 feet in excess of the selected REL for PCE in soil. REL for PCE = 0.05 mg/kg.
ft bgs = feet below ground surface.
mg/kg = milligrams per kilogram.
MTCA = Model Toxics Control Act.
PCE = tetrachloroethene.
REL = remediation level.

0 10 20
Feet

Data Source
Aerial photograph (2014) obtained from Clark County.

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Path: X:\0239.33\05\ArcMap\Fig4-1 Cleanup Action.mxd
Print Date: 4/19/2023
Reviewed by: mdandrea
Produced By: jroberts
Project: M0239.33.005